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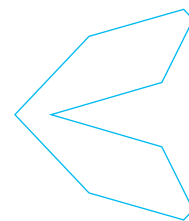
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**GUEST
EDITORIAL**

Mythical Identities, Scientific Realities, and Search for Transpersonal Meaning

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KEYWORDS

Myth, mythology, fact, history,
science, transpersonal

Myths weave in and out of historical context, even as dreams do relative to daily life, functioning in the modern world much as they did in earlier times, operating at both the personal and cultural levels. This essay discusses three special difficulties in appreciating the power of myth and understanding its reasons for being: (a) the nearly universal tendency to situate myth as the opposite of fact and truth, (b) the problem of identifying prevailing myths in culture and private life, and (c) the challenge of acknowledging myth as more than a personal intellectual construct or a cultural construction. Transpersonal theory offers a way forward in addressing these difficulties by placing personal and cultural myths and their relationship to historic–scientific fact in a greater context that endows them with greater meaning and reason for being than ordinarily appreciated by orthodox, mainstream Western psychology. Let us explore this premise in detail.

“FACT OR MYTH; SYMBOL OR REALITY?”

One special difficulty in appreciating the power of myth and understanding its reason for being is the nearly universal tendency in modern times to place myth and mythology in an adversarial relationship with scientific and historical fact. Either you believe in the myth, or you believe what seems to be hard fact. On the one hand, myth and mythology are denounced as falsehoods, untrue stories that we tell ourselves about who we are and where we came from, or as fabricated inventions of the imagination and the emotions presenting distorted versions of factual events created by primitive minds to give meaning, order, and control over an otherwise unintelligible, chaotic, and frightening universe. Mythical thinking is viewed as a kind of irrationalism designed to inculcate a particular attitude, belief system, or set of values that go largely unquestioned and that gives rise to distorted or blatantly false accounts of “the truth about things” or “what actually happened” (i.e., historical fact; Heehs, 1994, p. 3). Such mythical thinking is said to characterize metaphysical systems known as Transcendentalism, Theosophy, mind cure/New Thought, and various forms of New Age spirituality that are construed to be little more than invented belief systems created by authors of sundry “movement texts” who attempt to legitimize their knowledge claims by appeals to authority, scientific data, or personal experience and by assertions of dubious historical continuity with some esoteric tradition (Hammer, 2004) (for examples of “invented traditions” and how historical facts can be progressively transformed into fictional narrative, see Heehs, 1994; Hobsbawm & Ranger, 1985). Myths and symbols, as products of emotion and imagination, would thus seem to be a lie, or at least not factual.

The tangible material reality of physical “concrete fact,” on the other hand, seems “provable,” therefore more real and truer, by virtue of its susceptibility to being verified or falsified via one’s own physical senses, by the eyewitness testimony of others, or by the material existence of historical documents where claims can be corroborated. Many



scholars make the further conceptual leap of placing fact and myth into distinct, non-interacting, and non-overlapping ontological categories (e.g., the real vs. the unreal, the possible vs. the impossible; the true vs. the not true) as if they were two entirely different kinds of things. On that view, the study of myth as myth or as metaphysics may have some value as an anthropological, sociological, or psychological curiosity, but such narratives are not to be construed to be a true account of any real state of affairs. This particular understanding of the nature and relationship of fact and myth is shared by many post-Enlightenment historians (Collingwood, 1946; Elton, 1976; Kirk, 1970).

The bifurcation of myth and fact, symbol and reality, into true/false categories of thought is arguably the result of enculturation and socialization learning processes early in life. Many people are taught from childhood that what is imaginary is not real and to consider so-called objective, sensory-based experience as the only criterion of reality. They soon refuse to admit into existence as real anything that they cannot see, hear, smell, taste, or touch through the physical senses and to regard any idea as not true unless it is “literal fact” because science tells them so. Concrete facts, in this way, come to serve as handy conceptual tools that lead us to make certain divisions in our experience which help us consign certain kinds of experiences as real, possible, and true and others as unreal, impossible, or untrue. We may be taught as children not to trust our personal experience, feelings, or dreams as offering any kind of valid explanation or understanding, especially when they do not fit accepted physical facts. Daydreaming or wishing is nothing more than “magical thinking,” we are told, and will get us nowhere. With that understanding, it becomes extremely difficult to accept the validity of subjective feelings that alone give an event any living meaning or see how a myth can change the world unless that myth is seen to have some “provable” basis in physical fact.

FACT AND MYTH AS RELATIVELY TRUE AND NOT TRUE

Because mythology weaves in and out of human history, myths sometimes *can* be linked to some “provable” concrete fact related to a person known to have lived (e.g., Jesus of Nazareth; Ehrman, 2012; King Arthur; Higham, 2005), a physical place known to exist (e.g., City of Troy/Illion; Wood, 1998), or a natural event known to have occurred (e.g., The Flood; Dundes, 1988). This link to something physical is often construed as proof that the myth may be a literal fact. The tendency to construe myth as true if it can be connected to some material

phenomenon in time and space, however, is a two-edged sword that, in the hands of the demythologizing historian, gives rise to the field of “geomythology” (Piccardi & Masse, 2007). Hesiod’s narrative of Zeus’s war against the Titans in Greek legend becomes explained as “creative misreading” of the eruption of a volcano, the Cyclopes who terrorized Odysseus in Homer’s epic poem *The Odyssey* becomes reduced to the fossilized remnants of prehistoric elephant skulls, and the origin of the mythological griffin with a lion’s body and bird’s head becomes a case of “creative misrecognition” of dinosaur bones (Vitaliano, 1968, 2007). The mythic account becomes devalued, robbed of its significance, and literally “brought down to earth” (pun intended) causing the emotional power of the original myth to dissolve into thin air.

The emotional power of myth, on the other hand, can combine with historical fact in the opposite direction to magnify and enlarge the individual reality of real-life persons who take on the identity of folk heroes such as Billy the Kid and Jesse James, participate in cultic worship of dead celebrities such as Elvis Presley and Princess Diana, or attribute magical powers to religious artifacts such as the Shroud of Turin. Created from the fabric of physical reality and couched in imaginative terms, such forms of “living mythically” occupy a symbolic and historical space that arguably transcends conventional categories of the positivist historian. In the words of transpersonal scholars David Feinstein and Stanley Krippner (1988),

To live mythically is to understand your life as an unfolding drama whose meaning is larger than your day-to-day concerns. . . . to seek guidance from your dreams, imagination, and other reflections of your inner being, as well as from the most inspiring people, practices, and institutions of your society. . . . [and] cultivate an ever-deepening relationship with the universe and its great mysteries. (p. 1)

Many of the facts disclosed in the historical record may be true, but it is the omissions, the dramatizations, the selection, abstraction, interpretation, and integration of historical fact with reconstructive memory that arguably are responsible for the “euphemistic transformation of documentary materials into fiction” in modern times (Heehs, 1994, pp. 15–16).

Living mythically and the mythical identities that it elicits bring to mind an awareness that myth-making processes continue to retain their emotional power as cultural forces today. Motifs from classical mythology (e.g., Odysseus’s adventures into the unknown, the pilgrim’s journey in Dante’s *Divine Comedy*, Sir Galahad’s quest for

the Holy Grail, the Greek fable of Psyche and Eros, and the dialogues of God and Satan in the Book of Job and of Krishna and Arjuna in the *Bhagavad Gita*) arguably speak to dilemmas germane to the modern psyche just as they did in ancient times and operate at both a cultural and personal level. Whether the myth-making process that gave rise to the motifs of classical mythology differs substantially from modern myth-forming processes remains a matter of healthy debate (Mayor, 2022; Murray 1960).

MYTH AND FACT AS NARRATIVE CONSTRUCTIONS

The argument that myths are false narrative constructions is a two-edged sword in the hands of postmodern social constructivism. If mythologies are narrative constructions, the argument goes, then so are so-called historical facts and scientific truth-claims which are likewise unavoidably shaped by the culture, language, beliefs, and worldview of one's reference group (Kukla, 2013; White, 1973). Analyses of life stories and evidential historical documents, on that view, will always have weaved into them the historian's operational understanding of what is "true" and how that truth can be found through the application of a particular kind of method that is attuned to detect and verify that particular understanding of truth. In the context of scientific research, as cognitive scientist William Uttal (2001) put it, "How we measure in large part determines *what* we measure—or, perhaps more precisely, *what we think we are measuring*" (p. 91). Implicit assumptions behind the research inevitably shape historians' selection and interpretation of data used to justify knowledge claims about what actually happened in the past, where, by whom, and why. From the perspective of transpersonal meaning, the printed word on the page of an historical document only has the physical reality of black marks on a white field. The physical words do not *contain* information, but *convey* information. Where is the information if it is not located on the printed page? It resides within the self. The historian is always a part of any empirical facts that he or she perceives, interprets, and understands, and whatever historical account is communicated to others is inevitably colored by the personality of the historian who passes it on.

On that view, the selection and interpretation of extant "empirical facts" by different people at different times in different cultures produces any number of *probable* histories that depend on what aspects of the past are emphasized or considered important from the standpoint of the present. As behavioral scientists Brent Slife and Richard Williams (1995) put it:

'Empirical' 'facts' are never purely factual nor purely empirical. They are always interpreted in the light of what the observer is looking for and how the observer frames what he or she sees. . . . Data can never be facts until they have been given an interpretation that is dependent on ideas that do not appear in the data themselves. (pp. 6, 222)

In that respect, the problem of underdetermination of theory by evidence—that is, "the evidence available to us at any given time may be insufficient to determine what beliefs we should hold in response to it;" (Stanford, 2021, paragraph 1)—is not limited to scientific contexts, but also applies to the insufficiency of empirical facts practically available to the historian to provide an infallible account of any historical event.

THE LANGUAGE OF MYTH AND GRAMMAR OF FACT

The apparent logical opposition of fact and myth may be more semantic and conceptual than real, and a function of the reasoning mind's natural tendency to categorize experience into abstract and theoretically distinct classes that renders them polar opposites and overlooks the ways they are related. Myth may be characterized as emotive, imaginative, symbolic, and associative whereas fact is described as rational, analytic, literal, and dissociative. Symbol and myth thus convey their meaning in the synthetic and metaphoric language of poetic and mythological images typically found in dreams and reveries, whereas the language and grammar of historical/scientific fact does so in abstract, linear, precise terms. As philosopher Alan Watts (1963) pointed out,

Factual language has a grammar and a structure which fragments the world into quite separate things and events. But this is not the way in which the world exists physically, for there is no thing, no event, save in relation to other things and events. . . . Thought divides what is undivided in nature. . . . The importance of a box for thought is that the inside is different from the outside. But in nature the walls of a box are what the inside and the outside have in common. (pp. 5, 45–46)

The grammar of facts, on the one hand, thus deals with separations, divisions, and distinctions, giving certain names and symbols for objects and events, dividing the perceiver from the world that then becomes objectified. As a consequence, the language and grammar of fact brings about a certain artificial shrinking and scaling down of

what constitutes the basic reality of subjective life to those aspects that can be studied in an exterior, physical fashion. The more precisely a word or concept is defined, the less meaning it can contain.

The language of myth, on the other hand, deals with relationships, unities, and psychic realities that do not easily or comfortably fit the categorical assumptions and conceptual distinctions on which the grammar of concrete literal fact is based. Myth and symbol are languages of the psyche that simultaneously reveal the basic reality of subjective life, while also concealing that same reality in the guise of quasi-sensory imagery, metaphor and allegory, parables and fairy tales, stories and folklore. The world of myth with its poetic and mythological language offers the possibilities of glimpses of what lies beyond the scientific realism and historical facts of physical existence and affords transpersonal (beyond ego) glimmers of the greater creative drama of the life we are given. The world of physical fact offers “a weak brew of reality” and, practically speaking, one’s experience of the world usually has little to do with the bare facts involved. We generally cannot and do not ever limit our lived world to the world of fact, even though we may try to do so.

Myth is more like poetry than like religion, science, history, or philosophy. This is why poetic and mythological images and symbols are so awkwardly and incompletely expressible in analytic, abstract, rational, linear, and scientifically exact terms. At those times when more efficacious ways are needed for communicating the ineffable meaning of a transcendent experience that occurs as a function of an individual’s personal/cultural mythology, Abraham Maslow (1964) recommended the use of what he called “rhapsodic communication” (i.e., “poetic and metaphoric language, physiognomic and synesthetic language, primary process language of the kind found in dreams, reveries, free associations and fantasies” p. 85). From the perspective of transpersonal meaning, the species’ religions, philosophies, psychologies, and sciences rise in response to an inner knowledge that is too vast to be clothed in the language of “outward things” and the grammar of normal waking consciousness alone.

MYTH AND FACT, NOT MYTH OR FACT

From the point of view of the logical historian, the problematic relationship between myth and fact would easily be solved if the two spheres—historical/scientific fact and mythic/symbolic consciousness—could remain conceptually disconnected and kept sequestered into their own proper non-overlapping, non-interacting magisterium (Gould, 1997). The traditional view of myth and fact as being contrary and distinct things has evolved, however,

with a growing recognition of the embeddedness of myth in historical experience and an acknowledgement that the evidential value of historical fact is not so easy to establish as previously believed (Heehs, 1994; Samuel & Thompson, 1990). The actual relationship between myth and fact, symbol and reality, has proven to be somewhat more complicated and much more profound than previously supposed.

The task of separating mythic interpretations from the factual components in historical accounts has become increasingly difficult to achieve as the symbiosis of symbolic myth and physical fact is recognized to be a function of *natural* human experience (Braud, 1994). As historian Peter Heehs (1994) put it,

Historical narratives are made up of factual (*logos*) and fictional (*mythos*) components [and] the intertwining of *logos* and *mythos* seems to make it impossible to draw an absolute line between fact and fiction. . . . Both myth and history remain valid and valuable forms of explanation. . . . People will continue to seek meaning in history, and will continue to develop myths to help them in this effort. (pp. 5, 18–19)

If it is true, as historians Raphael Samuel and Paul Thompson (1990) state, that “myth lies behind any historical evidence” and that “myth [is] embedded in real [historical] experience: both growing from it and helping to shape its perception” (pp. 4, 6), then there is no need to choose one and jettison the other. To avoid dichotomizing these basically *inseparable* constituents of human thought, a both/and rather than either/or approach is required—what Maslow called “double-view thinking”—whereby one considers “in what sense is it right and in what sense wrong? Assume conflict, ambivalence, dichotomizing, & transcend them by inclusive or hierarchical or holistic or levels thinking” (Lowry, 1979, Vol. 2, p. 931).

The interweaving of fact and myth in historical accounts does not relieve the historian of his or her responsibility to base their accounts on documentary evidence of what actually happened in the past. Nor does it relieve historians of the obligation to deal with this evidence objectively so that the evidence is not misread and their concrete judgments of fact are not distorted as a result of hidden preconceptions, assumptions, or beliefs that the historian may implicitly hold. There are instances when historical facts and factual explanations of events are not “trivial,” especially as applied in the arena of politics, pandemics, and climate change today. Historian William McNeill’s (1986) theory of “Mythistory” suggests itself as one possible approach to the challenge of integrating

the psychic realism of myth and the scientific realism of fact—a version of the past that is “adequate to the facts that could be established beyond all reasonable doubt” but whose meaning remains trivial unless given meaning and intelligibility by the cultural and personal mythology behind those facts (pp. 8–9).

THE MYTHS WE LIVE BY

So far, I have discussed the apparent adversarial relationship between myth and fact and how myth-forming processes that weave in and out of history can serve as a platform either to construct personal mythic identities or deconstruct the factual claims of traditional cultural mythologies. I examined the role of culture and language in the narrative construction of myth and historical/scientific fact-claims and explained why the traditional view of myth and fact as polar opposites requires rethinking, in light of the embeddedness of mythic thinking in historical experience. Precisely how mythic thinking that lies behind life stories and historical narratives finds its source in cultural and personal mythology, including in the creation of probable mythic identities, remains to be explored.

A special difficulty in recognizing the embeddedness of myth in historical experience and appreciating its power to shape historical events is that the prevailing myths of our times are not easy to identify because they are the psychological medium in which we live our life—as invisible as the air we breathe and as imperceptible as water must be to a fish. On an individual personal level, myths constitute (by hypothesis) private theories about the nature of the self, other people, and the world that guide behavior and structure memory. On a collective cultural level, myths take the form of basic assumptions and shared images and beliefs that are at the heart of a culture’s enculturation and socialization learning processes (Feinstein & Krippner, 1988). The assumptions that lie behind personal mythology and the mythology of one’s culture not only color a person’s experience, but also lead people, individually and collectively, to *create* historical events that more or less conform to those assumptions. We interpret and organize the events of our life through our ideas and beliefs and have a tendency to only attend to those perceptions that give those ideas and beliefs validity. Through their cast, we view and act upon our world.

Operating for the most part outside of conscious awareness, these psychologically invisible ideas and beliefs about the nature of reality and the meaning of life (i.e., domains traditionally assigned to mythology) can program our experience to such an extent that they take on the appearance of fact. Interpreting the private and social events of daily life in light of one’s beliefs about the nature

of the self, other people, and the world, we unconsciously put together our perceptions so that they seemed to bear out those beliefs. Imagination and emotion, following the contours of those beliefs, selectively structure one’s experience so that it comes to fit the beliefs one has about it. In this way, perception and belief become mutually reinforcing so that what one believes to be true becomes true in one’s experience. Believed in fervently, the ideas come to act like powerful hypnotic suggestions that trigger specific actions strongly implied by the ideas. The result is a set of unexamined assumptions hidden behind ideas and beliefs that are automatically acted upon to create the artifacts, behaviors, and events that emerge as “historical fact” in time and space. According to transpersonal scholar Charles Tart (1975/1992), “As long as the assumptions [hidden behind these ideas and beliefs] are implicit, we have no opportunity to question them and possibly escape from their controlling power over us” (p. 111).

CULTURAL MYTHOLOGY

The cultural myths of contemporary Western civilization that support the creation of mythical identities tend to be connected with religion, economy, patriotism, family loyalty, and political affiliations and emphasize themes supporting the gaining of wealth and the invention of technological marvels (e.g., “Money and technology will solve almost any problem”), the accumulation of power (e.g., “Might makes right”), the control and subjugation of nature (e.g., “Animals are given as a gift from God to humans for their own use and benefit”), and progress (e.g., “Our civilization, which is the greatest civilization that ever existed on this planet, is steadily progressing because it uses an aggressive, dominator-oriented approach in understanding and controlling the universe”). Some cultural myths serve to describe or explain the mysteries of life and the nature of the universe (e.g., “Natural disasters and illness are punishments sent by God, life is a valley of sorrows, and the universe is a harsh, uncaring, unresponsive place” or “We are children of the universe, life is good, and nature is filled with innocence and joy”).

Other myths address the human condition (e.g., “Youth is the crowning glory of life from which there is no further journey but descent” or “Youth has its own wisdom and old age its joy;” “Women are feminine; men are masculine”) or provide direction for social behavior (“Everything worthwhile in life comes through hard work;” “The end justifies the means”). Still other cultural myths are concerned with the purpose of life (“The only real purpose in life is to maximize pleasure and minimize pain, make money and acquire more possessions”). Although not fully appreciated or understood as such, these ideas and beliefs

are mythical in character because they address one or more of the domains within which mythology traditionally functions; that is, they serve to explain the world, guide personal development, provide social direction, or address spiritual longings (Campbell, 1983).

Those myths that speak to the species' spiritual longing tend to transcend the culture of one's birth and exist in hundreds of versions around the world. The Cinderella fairy tale, for instance, conveys the idea that we have a hand in the creation of the events that seem to happen to us. The Christ story represents humanity's dream of achieving brotherhood and a workable morality. The Crucifixion tale stands for the notion that one must die first before one can be saved or obtain great knowledge. The Easter (Resurrection/Ascension) myth gives voice to the expectation that each person survives bodily death by virtue of his or her existence within an ultimate Divine. Each of these narratives, in their own way, connect the species with a dimension of reality in which dreams and ideals quite literally come true.

It may be difficult to perceive the mythical nature of science since it works so well (Bauer, 1992). Yet science also functions in one or more domains traditionally assigned to mythology in terms of its assumptions about the nature of reality (e.g., "Only the physical is real"), human knowing (e.g., "All true and certain knowledge must come through the physical senses"), and the purpose of the universe ("There is no purpose or reason for the universe existing because it was created accidentally out of nothing or created itself"). Scientific myths may serve as explanations of human nature (e.g., "We are our body and nothing more, completely determined by our genetic inheritance and environment, existing in relative isolation from our surroundings") and human consciousness (e.g., "Consciousness is produced by the activity of the brain with physical death the final termination of consciousness") (Tart, 1975/1992, Chapter 2). These descriptions and explanations of the "laws of nature" are considered "obvious facts" from the viewpoint of sensory-based, atheistic, materialist science. They are, nevertheless, still theories, relative truths, or operational beliefs that take on the appearance of "exact knowledge" and "empirically verified truths" only in reference to a particular experience with reality from the viewpoint of a certain level of consciousness as a result of a particular perceptive apparatus (Griffin, 2000). The myths of science program our interpretation of events just as much as the mythical characteristics of religion do. Researchers have been trained to believe that recreating or reproducing a phenomenon in a laboratory setting demonstrates control and mastery over the phenomenon, for instance. The more precise and faithful the replication of the phenomenon, the more complete the mastery. This has quite magical connotations.

Cultural myths of various kinds are disseminated through parents, teachers, and peers, books and songs, movies and television stories, and social media such as Twitter, Facebook, and YouTube. Through the filter of a culture's mythology, members of a society come to interpret the events of their life, their triumphs and failures, health and illness, fortunes and misfortunes. Philosopher Sam Keen and psychotherapist Anne Valley Fox (1973) observed:

So long as human beings change and make history, so long as children are born and old people die, there will be tales to explain why sorrow darkens the day and stars fill the night. We invent stories about the origin and conclusion of life because they help us find our way, our place at the heart of mystery. (p. 158)

Cultural myths permeate all areas of society to instill the collective mythology into an individual's personal mythology.

PERSONAL MYTHOLOGY

For much of the history of human civilization, the myths held by individuals in a society were relatively uniform, allowing for little question or variation. Sons followed the trades of their fathers, people held similar religious convictions, gender roles were rigidly prescribed, moral "law" and social hierarchies seemed to be a part of the natural order. Not so today. Long-enduring myths, religious beliefs, family traditions, and cultural images have been cracking and drifting toward obsolescence. We are less able or willing to rely on the cultural myths of yesteryear to explain the world, guide personal development, provide social direction, or address the spiritual longings of today. As existential-humanistic psychologist Rollo May (1969) put it, "The old myths and symbols by which we oriented ourselves are gone, anxiety is rampant . . . The individual is forced to turn inward" (pp. 13–14). As a result, mythology has become an increasingly personal affair. Theologian Anthea Francine (1983) observed that the "revelations of the Divine [that] we once found revealed only in the form of myth and fairy tale, we must now seek also in the story of our own lives" (p. 77).

These life stories take the form of personal myth and personal mythology. The term "personal myth" was first introduced into the psychiatric literature by Ernst Kris (1956). The construct "personal mythology" was introduced later by clinical psychologist David Feinstein (1979) "to describe the way people construct their understanding of themselves and their place in the world [and] to present a

five-stage model designed to assist individuals in working with their inner mythologies” (Feinstein & Krippner, 1988, p. 10). In those terms, a personal mythology takes the form of an idiosyncratic self-psychology and model of reality that shapes how an individual sees herself or himself, other people in one’s world, and the society and culture in which one lives. Personal mythology is often expressed in the form of competing themes or fragments of cultural myths, such as “I am too old (young, fat/skinny, smart/dumb, sensitive/unfeeling, athletic/non-athletic, etc.) to _____;” “Nobody loves me because I am unlovable;” “I always have bad luck;” “People are basically bad/good and out to harm/help me;” “Money (or being beautiful, talented, happy, etc.) is the most important thing in life;” “Every day, in every way, I am getting better and better/growing worse, and so is the world.” According to Feinstein and Krippner (1988),

Your personal mythology gives meaning to every situation you meet and determines what you do in it. [It] acts as a lens that colors your perceptions according to its own assumptions and values. It highlights certain possibilities and shadows others. Through it, you view the ever-changing panorama of your experiences in the world . . . Personal myths explain the world, guide personal development, provide social direction, and address spiritual longings in a manner that is analogous to the way cultural myths carry out those functions for entire societies. Personal myths do for an individual what cultural myths do for a community. (pp. 1, 24)

From the perspective of transpersonal meaning, a personal mythology might be in the form of themes such as, “I am a good and deserving creature, eternally couched and supported by the universe of which I am a valuable part, and whose elements and parts are of good intent;” “It is good, natural, and safe for me to grow and develop and use my abilities, and by doing so I enrich all other portions of life, even as my own being is enriched by the rest of creation;” “All of my imperfections, and all of the imperfections of other creatures are redeemed in the greater scheme of the universe in which I have my being” (Roberts, 1997, p. 68).

MYTHIC IDENTITIES AS PROBABLE SELVES

Much remains to be learned about the role of personal mythology in living mythically and in the creation of mythic identities. According to Feinstein and Krippner (1988), one’s personal mythology is a function of four interacting sources: biology, personal history, culture, and transcendent experiences (i.e., “those episodes, insights, dreams, and

visions that have a numinous quality which seems to expand our comprehension and inspire our behavior,” p. 186). We still need to understand how people choose among particular myths and how they alter and reinterpret those chosen myths in light of experiences throughout their lifespan. What also remains to be investigated is how some of those re-interpretations break through an existing mythical frame to lead the individual to choose a different myth that opens up new areas of expression and avenues of choice previously ignored, overlooked, or denied and to pursue possibilities of transpersonal (beyond ego) awareness and development that may become a reality in an individual’s probable future.

Transpersonal Psychology—an empirical (experiential) and hermeneutic (interpretive) subdiscipline of psychology that Abraham Maslow (1968) characterized as “transhuman, centered in the cosmos, rather than in human needs and interest, going beyond humanness, identity, self-actualization, and the like” (p. iv)—can make an important contribution in that investigation (Cunningham, 2022). I invite the reader to try the following experiment.

Choose from your own past a scene in which a choice was involved that was important to you. Experience it as clearly as possible imaginatively. [Pause] Now imagine “what might have happened” had you taken the course you did not take with the other decision, or decisions that you might have made. [Pause] Now take any incident that happens to you the day you read this page with the idea of its probable extensions. See the particular chosen event as one that came into your experience from a vast bank of other probable events that could have occurred. [Pause] Try to trace its emergence from the thread of your own past life. [Pause] Then project outward in your mind what other events might emerge from that one to become actual in your probable future. [Pause] Now change your viewpoint; see the event from the standpoint of someone else who is also involved and see the episode through his or her eyes, using this altered viewpoint. (Roberts, 1977–1979, pp. 109–110, 179, 324)

From the perspective of transpersonal meaning, as this experiment is repeated over a period of time, alternate modes of perception may open up where you are likely to find yourself thinking about probable actions you could perform in the present and out of which other probable events and probable selves could emerge in the future. By viewing the choices you make from more than one standpoint, you may discover yourself breaking through

an existing mythical frame to find a line of development you wished you had pursued, but had not, and reflect on ways in which it could now fit into the framework of your present life. This is the search for transpersonal meaning in action. Transpersonal theory can advance understanding of the function that such imaginings of probable events and probable selves might serve in the creation of mythic identities.

THE SEARCH FOR TRANSPERSONAL MEANING

Up to this point, I have explained why the oppositional relationship between myth and fact, symbol and reality, is more apparent than real and how cultural and personal mythology serves a constructive role in the meaning-making processes that inform life stories and historical narratives, including the creation of probable mythic identities. How the transpersonal nature of human psychology makes the relationship between myth and fact much more complicated and far more profound than ordinarily recognized remains to be discussed.

In differing ways, physical fact and cultural/personal mythology describe different worlds or rather the same world seen in another way. The two kinds of experience—the physical and the psychic, the literal and the symbolic, the factual and the mythic—constantly enrich each other and there are always interactions. They are related “like the poles of the earth or of a magnet, or the ends of a stick or the faces of a coin” or what is to my left can be to your right and involve no contradiction (Watts, 1963, p. 45). It is a creative error to see the world of fact and the world of myth as separate and apart. What is physical and what is symbolic are so inseparable and interconnected that an attempt to find one apart from the other automatically confuses the issue. I invite the reader to try the following experiment.

Imagine that your present experience of the moment is a dream, and is highly symbolic. Then try to interpret it as such. [Pause] Who are the people? What do they represent? [Pause] If that experience were a dream what would it mean? [Pause] Into what kind of waking life would you rise in the morning? (Roberts, 1979, pp. 51–52)

From the transpersonal perspective of Aspect Psychology of Jane Roberts (1979), imagination “brings you into connection with a different kind of truth, or a different framework in which experience can be legitimately perceived. The larger truths of the psyche exist in that dimension. From it you choose physical facts” (p. 120). On

that view, myths are natural kinds of phenomena, rising from inner realities of the human psyche, whose deeper actuality serves as source material for the world that we know.

The insights of Bruno Bettelheim (1977), Jean Shinoda Bolen (1984), Joseph Campbell (1968), James Hillman (1979), Jean Houston (1987), Robert Johnson (1986), Rollo May (1989), Arnold Mindell (1985), and William Irwin Thompson (1981) in the last century have added plausible credibility to the existence of a subliminal transpersonal (beyond ego) dimension that might serve as this source material. Myths often take the guise of dramas because, like dreams, they are a translation of a deeper experience that bridges perceptions from one level of the psyche to another. We see operative in cultural and personal mythologies many of the dynamic processes of dreamtime and dream work—the condensations, displacements, substitutions, amplifications, reversals, elaborations, and a “value fulfillment” that meets one’s needs, fulfills one’s desires, wards off one’s fears, stimulates development, and points to further possibilities of development in personal and cultural consciousness (Krippner, 1990).

On that view, the interweaving of scientific realism of historical fact and psychic realism of dreams combines two realities that become a source of myth’s power to infuse civilizations with a new vitality, open up new historical and cultural periods, and literally alter the course of humanity’s evolution itself. Myths can be of such power and strength that whole civilizations rise from their source, much as the myths given in Christian theology established precepts on which early Western Civilization was built. The intuitive comprehensions and emotional realizations of myth and symbol connect to the physical world of historical fact so that that the world is never the same again. Historical fact, in itself, could never accomplish this on its own.

IS ANYTHING REAL HAPPENING?

By hypothesis, the meaning and power of myth springs from its source in the actions of emotions, imagination, and dreams and gives us our closest contact with the natural psychic environment in which the species’ own greater reality resides, mythic events happen, and historical fact emerges (Roberts, 1981, chapter 3). Personality action, at some level, reflects deep mythological images and archetypal dimensions of the human mind that transcend early conditioning and cultural setting, while simultaneously being shaped by the myths of the surrounding culture. By hypothesis, just as there is a “deep structure” to the grammar of native languages, there is a deep structure to the myth-making process that grounds the species’ capacity to live mythically. For Jung

(1947/1960), “the essential content of all mythologies and all religions . . . is archetypal,” p. 206) and, in that respect, *archetypes* would serve as one constituent of the deep structure of personal and cultural myth (Vaughan, 2013).

Myths are born of the emotions of creativity and are quite real in the Imaginal realms of the human psyche (Chittick, 1989; Corbin, 1969). The natural order and structure of the world of dreams, although unperceived by the physical senses, represent a reality as valid and significant as the natural world that is perceived by physical senses. It is the natural environment of imagination and emotion where a valid reality *that exists on its own* is experienced—a reality in which the psyche’s own language of emotion and imagination is given greater freedom. It is an emotional and imaginative freedom in which experience and perception are not dependent upon precise spatial locations or dateable time periods of physical historical fact. It is a freedom that liberates the powers of the reasoning mind so that its range is expanded and its understanding is not limited by a language and grammar of facts that arbitrarily decides which things are true, real, or possible, and which things are not. It presupposes a subjective framework in which the individual freely experiences and expresses the most vivid ideas and moving emotions in the most direct of fashions, whether or not they are replicated in waking life as historical fact.

Jung (1933/1960) held the position that the world of imagination, symbol, and myth in many ways is closer to the way reality really is than what is referred to as physical, material, “sensory-hard” facts that one can see, hear, feel, smell, and touch. From the perspective of transpersonal meaning, myths are real in every fashion except that of physical fact. The existence of myths presupposes the existence of experience that is not defined as physical fact. In the life of the psyche, a myth is no more or less “true” or “real” whether it happens or not in waking life. Television characters of a favorite western, murder mystery, or science fiction drama, for instance, may attain a level of reality in the mind of viewers that is more real, tangible, and substantial than the lives of the actual actors who portray those characters. As Feinstein and Krippner (1988) put it, “Myths, in this broader sense, are not properly understood as being true or false, or right or wrong. They are ways of organizing experience that may ultimately be judged as more or less effective for the well-being and performance of an individual or group” (p. 4). In those terms, it is futile to question whether or not myths are true, for they simply are. From the perspective of transpersonal meaning, “To be, simply to be, is enough.” Being requires no further justification.

TWO EXAMPLES

The special difficulties in appreciating the power myth and understanding its reason for being can best be clarified by two examples: Charles Darwin’s theory of evolution and the prolonged apparition at Medjugorje. Charles Darwin’s theory is examined to identify mythological elements that may partially account for its mythic status in modern times. The prolonged Marian apparition at Medjugorje illustrates how cultural and personal mythology combine to produce mythical identities in a religious and spiritual context.

Darwin’s Theory of Evolution

It is not sufficiently appreciated or understood how historical facts and scientific theories—like the myths they are expected to describe and explain—are formed and maintained through the use of human imagination (Brann, 1991). Consider the mythic status of imaginative constructs such as Freud’s theory of the unconscious, science’s “Big Bang” theory of the origin of the universe, and Darwin’s theory of evolution that have literally structured generations of people’s experience of themselves and of the natural world. The ideas, feelings, and values that endow Darwin’s theory with its mythic status today are as real and, in some instances, more real than the chair upon which one sits because of its tangible effect on contemporary education, business, religion, psychology, politics, science, child-rearing practices, and social behaviors of all kinds.

Charles Darwin spent more than half his life proving the validity of his theory of evolution, and generations of scientists since have viewed the natural world through its light. Despite the theory’s empirical problems—for instance, the absence of transitional species in the fossil record and the presence of fundamentally discontinuous, highly complex, *non-adaptive* body forms (*Bauplans*) and novel taxa-defining traits (e.g., feathers, fins, scales, wings, the placenta, the pentadactyl limb) that have no antecedent structure in any presumed ancestral form and that remained fixed for millions of years after their evolutionary emergence—that cannot be explained by the gradual, cumulative selection of small adaptive changes that is at the core of evolutionary theory (Denton, 2016; Wesson, 1991), scores of scientists continue to take Neo-Darwinian theories as being a literal interpretation of the origin of species and stubbornly attempt to make human nature conform to the picture of evolution as Darwin conceived it.

There are many theories of the species’ origins other than Darwin’s that have held sway over the imagination of humanity for far longer periods of time and whose

effect upon their culture was arguably equal to or greater than that of Darwin's theory upon our own culture today. Consider the longevity and impact on the early history of human civilization of the God myths of the religions of the Babylonians, Egyptians, and the ancient Greeks, whose effect upon their cultures was arguably as great as Christianity's upon our own. They understood their gods to be quite real—mythical beings who cast their light over historical events because they were responsible for those events. Those theories, like Darwin's, were likewise considered in their time to be a matter of historical fact and based on the evidence of experience and the authority of reason. From the Neo-Darwinism standpoint in the present, those ancient theories are considered myths—pagan stories that have no basis in the world of fact. That conclusion, in my view, follows from a fetish faith in the evidence of the physical senses and ignores the psychic (pertaining to psyche) dimension of emotion, imagination, and dreams that is the source (by hypothesis) of those physical facts of which they are so proud.

If I say that Darwin's theory of evolution is a myth, most readers will interpret this to mean that Darwin's theory has no basis in truth. That is *not* the meaning of the word "myth" that I use here. As an organizer of thought and energizer of action, myth is an indispensable constituent of human experience, thought, and behavior. In the words of philosopher Alan Watts (1963),

Myths are the instruments by which we continually struggle to make our experience intelligible to ourselves. A myth is a large concrete image that gives philosophical meaning to the facts of ordinary life; that is, which has organizing value for experience. . . . The mythical mode of thought is able to convey things which are difficult to express otherwise, and therefore myth still has value for an age of science and scientific philosophy. (p. 3)

The early myths of humanity's origins convey the grandeur and energy of nature and carry remnants of the great sway of nature's own emotional force as it is interpreted through the species' experience. Once the myth becomes standardized and is interpreted too literally, however, and is tied too tightly to the world of physical fact, as Neo-Darwinian theory has become, then nature's manifestations become misread (Cunningham, 2009) and the myth is brought into areas where it does not meaningfully apply (Rose & Rose, 2000).

The Prolonged Marian Apparition at Medjugorje

A contemporary example of the synergy that can occur when cultural mythology combines with personal mythology to create mythical identities in the context of religion and spirituality is the prolonged apparition of the Blessed Virgin Mary (BVM) at Medjugorje in the Republic of Bosnia-Herzegovina of the former Yugoslavia. The Marian apparition was first reported by six Croatian adolescents on June 25, 1981, and continues to this day. No matter what the apparition's status turns out to be in the world of concrete fact, it has given an objectivity to believers' religious sentiments that it would not otherwise have (Cunningham, 2011).

The phenomenon of Medjugorje demonstrates how an apparition that only the six "Seers of Medjugorje" can perceive but which bystanders cannot, nevertheless attains a reality in historical fact because of the physical effect ("fruits") it produces in pilgrims' experience of themselves and their lived world (Margry, 2021). As William James (1902/1936) put it,

The unseen region in question is not merely ideal, for it produces effects in this world. When we commune with it, work is actually done upon our finite personality . . . But that which produces effects within another reality must be termed a reality itself, so I feel as if we have no philosophic excuse for calling the unseen or mystical world unreal. (pp. 506–507)

As a symbolic representation of an inner order of events, the Marian apparition is true; as a literal interpretation of the basic reality of the BVM entity, it is false. The Medjugorje apparition would be considered both true and not true in those terms. The quasi-sensory symbol (i.e., the Marian apparition) is not the basic reality (i.e., the BVM entity) just as the map is not the territory, the menu is not the meal, and the printed word or oral report is not the thought or the emotion that it attempts to convey. They are arguably different orders of reality that interact and overlap, but to confuse them is to commit what Aristotle called a category mistake. The criteria used to measure what is "fact" at one level cannot be used to measure what is fact at another level. When literal interpretations are demanded, then the BVM must be seen to be believed and the methods of objective physical science are brought into an area where such methods do not meaningfully apply.

The problem is in taking the exterior dramatization and quasi-physical personification of the apparition to be

literally and concretely true—a natural enough mistake given that Western culture teaches that only “literal fact” is true. When symbolic realities become interpreted literally or when the symbol is accepted as literal truth—for example, God really did create the material universe and all of its inhabitants in six or seven days as described in Genesis; Moses really did part the physical Red Sea as described in the Book of Exodus; Jesus really was born of a biological virgin as described in the New Testament—then its nature is inevitably misunderstood, and personal difficulties can arise. When the Judeo-Christian myth of God is taken literally as a concrete fact—that is, there really is one white-haired, old, male super individual who exists as God in some remote, isolated heaven, who is kind to believers but threatens hell and damnation to sinners and disbelievers, and who will one day destroy the world—and the person finds that this does not make much logical sense to them, then they are confronted with a dilemma: Either believe the myth or reject the psychic reality that the God concept hints at (as humanity now envisions it) and the strong element of truth that still lies behind the myth.

The problem is in taking the symbol that stands for a reality that is not experienced in usual sensory terms and insisting upon a literal interpretation. “When we accept the symbol as literal truth in a fact world,” wrote trance channel Jane Roberts (1976), “we make lies of them or let them make lies of us, so that they stand between us and the truths they’re meant to represent . . . We end up with romantic pretenses, false in both worlds” (pp. 304, 352). From the perspective of transpersonal meaning, the answer or solution to the dilemma lies in looking behind the symbolism, beyond the inner morality play, for the greater meanings beneath. In the words of transpersonal theorist Ken Wilber (1999), “when myth is consciously used in an allegorical, symbolic, or interpretive fashion, it is actually drawing on higher cognitive faculties, reason to vision-logic, and, in that mode, occasionally stands open to transpersonal glimmers” (p. 110).

CONCLUSION

In discussions concerning the relationship of mythic identities, scientific realism, and the search for transpersonal meaning, the first step is to shun the crude weighing of “mythos” against “logos.” Recognizing the role of personal and cultural mythology in the production and interpretation of the story of our lives and in the analysis of historical documents of a culture brings into view a much broader understanding of the historian’s craft (Williams, 2003). In the words of Samuel and Thompson (1990),

We discover a psychic dimension which recognizes the power of myth and unconscious desire as forces, not only in history, but in shaping our own lives. We open up a history which pivots on the *active* relationship between past and present, subjective and objective, poetic and political. . . . in which some incidents are dramatized, others contextualized, yet others passed over in silence, through a process of narrative shaping in which both conscious and unconscious, myth and reality, played significant parts. (p. 5)

From the perspective of transpersonal meaning, the acknowledgement of a psychic dimension in the creation of historical fact brings an appreciation of the interweaving of myth in and out of history and of the role of emotions, imagination, and dreams in the creation of mythic identity at both the cultural and personal levels. It releases the historian from a slavish dependence upon literal concrete fact and raises new questions about the relationship between the scientific realism of physical fact and the psychic realism of cultural and personal mythology as source material of those facts. Importantly, it opens up further avenues of discovery regarding the basic reality of subjective life and the transpersonal nature of human psychology.

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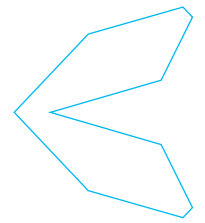
Good editorials are generally characterized as pithy (e.g., Singh & Singh, 2006), but thanks goes to the Editor-in-Chief for inviting me to tell a longer story that reflects my many years of thinking. Address correspondence to: Paul F. Cunningham, Ph.D., 9 Woodward Drive, Milford, NH 03055 Email: pcunningham@rivier.edu or pfcunning@comcast.net

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**RESEARCH
ARTICLE**

Speculations on the True Holy Grail

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HIGHLIGHTS

Good evidence hints that the Holy Grail was not originally about a chalice or ‘cup of Christ’ but instead referred to the historic artifact known as the Shroud of Turin.

ABSTRACT

The Holy Grail was said to be the chalice used by Jesus Christ at the Last Supper and also supposedly employed by Joseph of Arimathea to catch the blood of Christ during his crucifixion. However, the concept of the Holy Grail as we know it is entirely a literary invention by a number of medieval authors starting in the 12th century. As it was combined with the tales of King Arthur, the stories became extremely popular, with their popularity lasting down to the present. What took place at the time to inspire this outpouring of literary works? This paper proposes that the object that inspired the medieval Grail authors was actually the Shroud of Turin, the alleged burial shroud of Christ which was stained with blood. The literary history of the Holy Grail and its role in inspiring the Grail literature is reviewed, as well as the history and the evidence for the authenticity of the Shroud of Turin.

KEYWORDS

Holy Grail, Shroud of Turin, historical analysis, folklore, religious artifacts

INTRODUCTION

The Holy Grail is generally thought of as the chalice (Figure 1) that Jesus Christ used at the Last Supper, and which was also said to be used by Joseph of Arimathea to catch Christ’s blood when his side was pierced on the cross. But despite the many stories surrounding it, there is little evidence the actual chalice inspired the Grail stories, as many of the stories focus on its symbolism rather than speaking of it as a literal object. Like the bread used in Christian communion services, the cup is a symbol of Jesus’ body or essence, and the wine in the cup represents the blood of Christ, which was poured out at his death as the ultimate sacrifice for the sins of humanity. As Jesus said in Luke 22:20 “This cup is the new covenant in my blood, which is poured out for you.”

The Eucharist, the celebration of bread and wine in remembrance of Christ, is thus the richest and most complex

of all religious symbols,¹ and the Holy Grail is typically presented as a gateway to immortality, and a means of securing eternal life for those who “drink” of it.²

Since the time of Christ, his followers have celebrated his death and resurrection in this manner, but the Last Supper cup itself did not become a focus of attention until a thousand years later. The Middle Ages was the era when the Holy Grail was invented as a literary concept. Grail legends and lore have captivated people since then, and the Holy Grail has become one of the most enduring of all symbols. Fascination with the Grail continued down through the centuries to the present and includes works such as the *DaVinci Code* and the 1989 movie *Indiana Jones and the Last Crusade*, with the ancient Templar Knight who utters the famous lines, “He chose poorly,” and, “You have chosen wisely!”



Figure 1. For indeed, Jews ask for signs and Greeks seek for wisdom; but we preach Christ crucified, to Jews a stumbling block, and to Gentiles foolishness. But to those who are the called, both Jews and Greeks, Christ is the power of God and the wisdom of God. ~ I Corinthians 1:22-24. From: <https://www.sears.com/ebros-gift-12001ebrcl2-ebros-merlin-s-holy-grail-the/p-A100910996>; https://indianajones.fandom.com/wiki/Holy_Grail

The Literary History of the Holy Grail

The grail stories tie together the great themes of passion, devotion, romantic love, chivalry, questing, birth, suffering, and death. A grail is always a “serving device” but the concept evolved and was expressed in different ways. The word “grail” comes from the Latin *gradale* meaning “gradually, in stages,” and can mean cup, chalice, dish, tureen, bowl, or platter, but was also conceptualized as a stone, or something ethereal or spiritual that defies explanation, culminating in the Holy Grail—the Cup of Christ containing wine representing his blood.³ Thus the origin of the word encapsulates the evolution and the transitions in its meaning, as well as the complexity of the underlying ideas.

The narrative begins with the Biblical Gospels which inspired an outpouring of literary and artistic works culminating a millennium later in the grail stories and romances of the 12th century. The latter were the most popular and compelling stories of their time—many were associated with King Arthur, and virtually all of them were chivalric tales involving knights on some type of quest. Following are the most significant grail-related writings as well as predecessor works from the time of Christ through the Middle Ages:

The Biblical Gospels (Matthew, Mark, Luke, and John). These are, of course, the stories of Jesus—his life, ministry, death, and resurrection. All of them mention the actions of Joseph of Arimathea (Figure 2) who provided the burial cloth and the tomb in which Jesus was buried.



Figure 2. Joseph of Arimathea catching Christ’s blood from the cross. From: Arthurian Art, <http://www.zendonaldson.com/twilight/camelot/art/stassen/stassen6.htm>

The Doctrine of Addai from the early 4th century (Howard, 1981) and the **Acts of Thaddeus** from the 6th century (Lipsius & Bonnet, 1891; Roberts & Donaldson, 1899, pp. 558–559; von Dobschutz, 1989). These are both historical and hagiographic and tell the story of King Abgar the ruler of the city of Edessa in what is now Turkey, from 4 BC to AD 50. Abgar was suffering from gout and leprosy and had apparently heard of the healings and miracles of Jesus, so he sent an emissary requesting medical help. Jesus washed his face, wiped it on a cloth on which the image of his face appeared, and then then sent one of his disciples to Edessa along with the cloth, which was described both as a towel and as a burial shroud. Abgar was healed of his disease, converted to Christianity, and Edessa became a Christian city.

The Acts of Pilate, from the 6th century (Roberts & Donaldson, 1951). In this story, Joseph of Arimathea was imprisoned by the Jewish authorities on Saturday and then released by Jesus after the Sunday resurrection. Jesus proved his identity by showing Joseph the burial shroud that the latter had provided, and which was still in the tomb (Figure 3). Other writings from this period mentioning Joseph include *The Gospel of Gamaliel*.

An Apocryphon of Joseph of Arimathea, in the Georgian Language (Harnack, 1901; Kluge, 1904). This 8th century manuscript from Russian Georgia is the first known reference to Joseph of Arimathea catching the blood of Christ:



Figure 3. The Garden tomb near the Garden of Gethsemane outside Jerusalem. From: <https://www1.cbn.com/cbnnews/israel/2018/march/he-is-risen-watch-garden-tomb-easter-sunrise-service-live-from-jerusalem>

“I, Joseph climbed Holy Golgotha, where the Lord’s Cross stood, and I collected in . . . the large shroud the precious blood that flowed from His side.” This text also alleges that Joseph and Philip, the disciple of Christ, built a church at Lydda near Jerusalem.

The Mabinogion (*The Red Book of Herges* and *The White Book of Rhydderch*). The Mabinogion is a collection of Welsh tales that date anywhere from the 5th century BC through the 13th century AD. Part of this collection is the tale of Peredur, another name for Perceval, the grail knight, involving the search for the grail. In this story the grail is a platter which holds the severed head of a man who had been killed by a sorceress, probably an allusion to the death of John the Baptist (*The Mabinogion*, www.missglen.net/arthurian/mabinogion/).

Historia Regum Britannie, by Geoffrey of Monmouth in England, written around AD 1136. This is supposedly a history of the kings of Britain, beginning with the Trojans of Homer’s *Iliad* and ending with the Anglo-Saxon kings of the 7th century. Geoffrey used sources that are now lost to us, as well as perhaps adding his own content and spin. This work was very popular in its time and forms the basis of much English lore written later. Some of the kings mentioned are Brutus, who supposedly founded Britain and named it after himself; Lear, later used by Shakespeare; Old King Cole of the nursery rhyme fame; King Lud after whom London was supposedly named; the emperor Constantine, who was crowned emperor of Rome in the English city of York; and most notably, King Arthur. Geoffrey also wrote several books about Merlin, and associated him with King Arthur and Stonehenge, and these works are the source of the later King Arthur tales (Monmouth, ca. 1136). However, Geoffrey did not make any mention of the grail. There

were several other authors in this period or earlier who wrote about or alluded to King Arthur and added various elements to the story, such as the round table and courtly love (i.e., knights enduring hardship and going on quests in order to win the favor of a lady). These include Nennius in *Historia Britonum*, William of Malmesbury in *Historia Regum Anglorum*, Wace in *Roman de Brut*, and Layamon in *Brut*. (History, Literature, and King Arthur, <https://faculty.winthrop.edu/kosterj/engl510/slideshows/arthurev.pdf>, King Arthur in Literature, <http://www.legendofkingarthur.co.uk/literature-king-arthur.htm>).

Le Conte du Graal, by Chrétien de Troyes and others in France, written during the period 1170 through 1240 (Staines, 1990). The name “Chrétien” means “Christian” and may have been a pen name for author, about whom little is known. *Le Conte du Graal* is a collection of poems concerning the ideals of chivalry and knighthood and were in turn based on the earlier *Chansons de Geste*, “songs of deeds,” which were anonymous songs and poems sung by troubadours about the days of Charlemagne. This was the era when chivalry, the Lord and the Lady, courtly love, and *Noblesse Oblige* were at their height, and the grail romances had a large impact on the societies of that day. These works captivated Europe with their concepts of nobility, virtue, honor, loyalty, devotion, and strong notions of the meaning of masculinity and femininity. The city of Troyes where Chrétien lived was also the European headquarters for the Knights Templar. European support for the Knights began there in 1128 by St. Bernard of Clairvaux, and the Templars played a significant role in those times.⁴

The writings of Chrétien were a conscious attempt to reduce the level of conflict that was occurring at the time, and redirect energies into building up society rather than ravaging it. Thus they were a follow-up to the “Peace of God” and the “Truce of God,” the first mass peace movements in history, which were promulgated by the Catholic Church beginning in 987 and 1027 respectively. Some of these literary works were actually commissioned by Henry II, King of France and England, or more likely Eleanor of Aquitaine, his queen, or Marie of France, Countess of Champagne.⁵ These were done for a different and much more prosaic purpose,⁶ nevertheless, one of the main motives of these writings was to elevate the conduct of men-at-arms so that these men would help build up society rather than tear it down.

Chrétien’s stories are set in ancient Britain, where the legendary King Arthur rules from his castle at Camelot with his queen Guinevere—albeit they spoke French and dressed in the European fashions of the Middle Ages rather than 6th century Britain. Chrétien stories are full of romance and magic, but they place Arthur in a supporting/observing role, with others taking the major parts, such as

Le Chevalier de la Charrette (the Knight of the Cart) about Gawain, Lancelot, and Guinevere. Chrétien introduces the grail in an associated tale, possibly the last one he wrote. It is the story of the knight Perceval, who visits the Fisher King in his grail castle. Perceval sees a dish (the grail) being carried by a beautiful girl, accompanied by a bleeding lance and a silver plate. But he fails to ask the all-important question related to the grail's secret and leaves the castle before discovering the grail's true meaning and significance. Chrétien died before the story could be completed, and therefore his ultimate vision of the grail was never revealed (www.princeton.edu/~lancelot/romance.html). Other writers completed the story after Chrétien's death, but other than Robert de Boron, their identities are unknown because they ascribed the writing to Chrétien. It is significant that the actual word used by Chrétien was "graal" (a serving dish), rather than "grail" (a chalice). The latter description would be applied a few years later by Robert de Boron.

Parzival, by Wolfram von Eschenbach written in Germany in the period 1205 through 1216. As previously mentioned, there were a number of authors who were inspired both by Chrétien and by Robert de Boron. *Parzival* is a narrative poem of chivalry and spirituality which tells the story of the last surviving grail knight, Percival, and his quest for the grail. Like Chrétien, Wolfram was also concerned with chivalry and improving the conduct of men-at-arms, but he took a much higher and more spiritual tone and focus. In this poem the grail is defined in mystical, spiritual terms, and is spoken of as being either a dish or a mysterious stone (<https://www.poetryintranslation.com/PITBR/German/Parzivalhome.php>). Wagner's last opera was based on von Eschenbach's work.⁷

Le Roman du Graal (*Joseph d'Armathe, Merlin, and Perceval*), by Robert de Boron in France, from circa 1200 to 1210 (Rogers, 1990; O'Gorman, 1970; Pontifical Institute of Medieval Studies, 1995). He was a poet and cleric employed by Gautier de Montbeliard, the Lord of Montfaucon, who joined the fourth crusade and then returned to France. Previous writing such as *The Acts of Pilate* and the *Apocryphon of Joseph of Arimathea, in the Georgian Language* had supplied various characters and plot elements. Robert de Boron built on and connected these, but most significantly created the Holy Grail as a literary concept. He was the first to designate the grail as holy and to indicate that it was the cup used by Joseph of Arimathea to catch the blood of Christ. This transformed Chrétien's symbol of a common serving dish ("a graal") into a holy chalice ("the Grail") (Ford, 2001).

As mentioned above, Chrétien's version of the Perceval story and his encounter with the Fisher-king was never finished. But de Boron's re-wrote the story, and in his

version Perceval uses the Grail to heal the Fisher-king. In a play on words, the French word for "fish" is "peche" but it also means "sin," so Perceval uses the Grail (i.e., the blood of Christ) to heal the sins of the king (i.e., the "Sinful-king" rather than the "Fisher-king"), who then is able to leave the world and enter heaven. In *Joseph d'Armathe*, de Boron replays *The Acts of Pilate*: Joseph is thrown into prison by the emperor Vespasian and is visited by Jesus in his cell. But in this version of the story Jesus gives him the Last Supper cup which sustains him through long years in prison. At the end of the story Joseph is released after Vespasian is healed of leprosy, not by the cup, but by a cloth containing the image and blood of Christ, in the same way that King Abgar of Edessa was healed of the same disease. De Boron thus fused a number of preceding works and connected the grail with the Shroud in compelling stories with hidden spiritual meanings.

The genius of Robert was essentially to unite the secular world with the divine in the same way that earlier writers such as Augustine connected Aristotle and Plato, the material and the spiritual, with the connection being the blood of Christ, the God-man. This fired the imaginations of others, and a large collection of chivalric and grail-related tales were written. They include the *First Continuation*, a story written around 1200. In this tale, Nicodemus⁸ (Figure 4) attempts to carve a statue of Christ as he had appeared on the cross. But Nicodemus could not complete it because the carving "could not be made by human hands." According to the story, God Himself had to shape this work of art, which is a possible reference to the Shroud.



Figure 4. Christ and Nicodemus. From: St. Joseph of Arimathea, <https://catholicsaintmedals.com/saints/st-joseph-of-arimathea/>

Another grail romance was **Perlesvaus**, written sometime between 1191 and 1225. This story alludes to an Easter ritual from the city of Edessa involving the Shroud (described in more detail below). King Arthur had a vision during mass in which he sees a lady offer her child to the priest. Then it appeared that the priest was holding a man,

crowned with thorns, who was also bleeding from his side, hands, and feet. Finally, the man's body changed back into the child. Later in the story the grail knight Gawain saw the secret of the grail: The chalice changed into a child, and then into the Crucified Christ, with the grail again serving as the vessel used by Joseph to collect Jesus' blood.

Yet another grail romance was *Queste del Saint Graal*, ca. 1225. In this story the grail knight Galahad sees a similar vision alluding to the same Easter ritual: the host from the Eucharist takes on the semblance of a child whose face blazed as bright as fire, who then entered into the bread. A bleeding Christ then emerges and administers the sacrament associating the grail with the Last Supper. All of these later became part of a larger work known as the *Vulgate* or the *Lancelot-Grail Cycle*, circa 1245, which was an attempt to collect all of the tales, add to them, and set them in a meaningful sequence. Beginning with de Boron, these stories associated the blood of Christ with both the Shroud and the Holy Grail.

Le Morte D'Arthur, by Sir Thomas Malory (ca. 1405–1471, www.luminarium.org/medlit/malory.htm), written in England around 1469. The stories about King Arthur and the Holy Grail from the *Lancelot-Grail Cycle* were extremely popular in the Middle Ages, but being written by various authors the narratives were different in style, tone, and content. Malory took all the of plot themes and wrote them into a consistent tale, from the birth of Arthur until his death. Furthermore, he gave the story the tragic and poignant character that we currently associate with King Arthur. Malory referred to the Holy Grail as the "Sangreal." This could mean one of two things depending on how the word is split: "San Greal" meaning "Holy Grail," or "Sang Real" meaning "Royal Blood." Malory may have intended this as a play on words, because if these two meanings are merged, we have a holy chalice that contained the royal blood of Christ.

The literary King Arthur (Figure 5) came from a line of supposedly British Christian kings said to be descended from Joseph of Arimathea. The "Arimathea" portion designates the town where he came from, which is also known as "Ramah" (or "Ramallah" as it is called today). The prophet Samuel in the Old Testament was also born and lived in Ramah, and this was the town referred to in the Gospel of Matthew as "A voice was heard in Ramah—Rachael weeping for her children" in response to King Herod's massacre of the innocents after the birth of Christ.⁹

It is said that Joseph of Arimathea was the great-uncle of Jesus (the Talmud indicates that Joseph was the younger brother of the father of Mary, the mother of Jesus, and thus Joseph was her uncle and Jesus' great-uncle) (Capt, 1983, p. 19). Jesus' father, also named Joseph, apparently died when the boy was still young, and under both Hebrew



Figure 5. King Arthur. From: Tapestry Art Designs, www.tapestry-art.com

and Roman law the next male of kin would become the legal guardian of the family. Joseph of Arimathea would then have assumed that role, which would also explain the fact that Joseph "went boldly unto Pilate . . . and Pilate gave the body [of Jesus] to Joseph" (Mark 15:43-45). According to law, unless the body of an executed criminal was claimed by the next of kin it was thrown into a common grave and all records would be wiped out (Capt, 1983, p. 20).

Tradition indicates that Joseph was a tin merchant. Tin is a necessary ingredient in the making of bronze, a popular metal of antiquity. There are tin mines in Cornwall in southern England which were one of the main sources of tin, and in operation long before the Christian era.¹⁰ So it is possible that Joseph had been there in the course of his trading activities, and it is speculated that he brought Jesus to England when the latter was a boy (the Bible is silent on where Jesus was and what he did from the age of 12 through 30) (Capt, 1983, p. 28). William Blake's poem of 1908 which became known as "Jerusalem" and is now the British national anthem was inspired by this story:

And did those feet in ancient time walk upon England's mountains green?

And was the Holy Lamb of God on England's pleasant pastures seen?

And did the Countenance Divine shine forth upon our clouded hills?

And was Jerusalem builded here amongst these dark satanic mills?

Furthermore, several ancient manuscripts assert that Joseph was commissioned by St. Philip, the disciple of Christ, to take the Gospel to Britain. The date given was AD 63, and it states that Joseph remained in Britain for the rest

of his life (Albanicus). There is also a story that on the way, or possibly on another voyage, he brought Mary Magdalene and Lazarus first to Cyprus and then to Marseilles in Gaul, as described in more detail below (Capt, 1983, p. 37).

The stories of Joseph tell us that he came to Glastonbury in Cornwall, the location of the Isle of Avalon in the King Arthur tales. The original name of Glastonbury Tor, the hill of Glastonbury, was “Ynys yr Afalon,” meaning The Isle of Avalon (Christian, 2021). In ancient times the area was flooded, so the Tor was an island in the “Lake of Avalon,” which is the location of the Arthurian “Lady of the Lake.” It is claimed that the Isle of Avalon is where the graves of King Arthur and his Queen Guinevere are located (Capt, 1983, p. 96). In 1190, the monks at Glastonbury Abbey were digging a grave and, in the process, supposedly discovered a coffin holding the remains of a man with severe head wounds. Beside him was the grave of a woman with a plait of golden hair. Also found was a lead cross bearing the inscription, “Here lies buried the famous King Arthur with Guinevere his second wife, in the Isle of Avalon” (Ford, 1996) (Figure 6). The cross and the plait of hair seem to be rather too convenient and may have been a hoax by the monastery in order to raise money for repairs. Also troubling is that the lead cross disappeared in the 18th century, but a drawing of the cross made by William Camden for the 1607/08 editions of his book, “Britannia” survives (Figure 6). However, there are problems with the relic hoax hypothesis that are described in the above-mentioned article.



Figure 6. A drawing of the lead cross that was said to be found under the graves of King Arthur and Queen Guinevere in Glastonbury. From: https://earlybritishkingdoms.com/arthur/glast_cross.html

If this story about Joseph was true, he was therefore Britain’s first evangelist and founder of the first church in

England¹¹ at Glastonbury (a mud and wattle structure that later became the “Lady Chapel,” the ruins of which can still be seen) (Capt, 1983, p. 45). The land for the church (reportedly “twelve hides”) was said to be given to him by a King Arviragus. Joseph supposedly thrust his staff into the ground on Wearyall Hill, and the staff budded and became the “Glastonbury Thorn,” which has been tended by the monks there for centuries. It was also said that he died and was buried in the Glastonbury area—near his grave is “the Well of Joseph” (Capt, 1983, p. 93–94).

De Boron wrote that Joseph brought the Grail cup with him to England, and other stories indicate that the cup was dropped into what became known as the “Chalice Well.” The water from this well flows out into the “Blood Spring” and has a high iron content, so the red deposits from the well-water are said to symbolize the iron nails used at the Crucifixion (Capt, 1983, pp. 85–89). De Boron also wrote that the table of King Arthur was the successor to the Last Supper table and was a symbol of the banquet that God will prepare after the end of the world. Similar to the Jewish Passover custom of leaving an empty seat at the table for the return of Elijah, one seat at the table was left open for the *Siege Perilous*, the Perilous Seat of the knight who would one day be successful in the quest for the Holy Grail.

The Talmud indicates that Joseph had a daughter named Anna, who would have been cousin to Mary, the mother of Jesus (Harlein Manuscripts, 25–59 f, 193b). It is also said that Anna married into what became a line of Welch kings which ultimately led to the Pendragons and to King Arthur, tying the heritage of the Christian kings of England back to Joseph of Arimathea.

But, despite the elaborate nature of these stories, the early Christianization of Britain is hagiographic and largely based on a scholarly mistake. The error was made by the Venerable Bede, a well-known English author who wrote the *Ecclesiastical History of Britain*. He relied on an associate who reported that while studying the papal files in Rome, he discovered the record of a letter received by Pope Eleutherus of the 2nd century from a King Lucio Britannio. This was interpreted as a British King Lucius asking for assistance in converting his lands to the Faith. No one had previously heard of a King Lucius of Britain (the country was still a Roman province at that time), but Bede took this as evidence that Britain had been evangelized and become Christian in that era. This reference was actually to King Abgar VIII from Edessa in Turkey (considered in more detail below in the history of the Shroud), but as Bede was widely read and quoted, this story was repeated (Scavone, 2010). It grew in the telling and in 1342 John of Glastonbury updated William of Malmesbury’s well-known book *Church in Glastonbury* and inserted an unknown king Arviragus who had been fictitiously invented by Geoffrey of Monmouth

into this history, as the ruler who provided the Glastonbury land for Joseph of Arimathea's church. Did Joseph of Arimathea actually come to Britain as its first evangelist and as the ancestor of royalty? Maybe or maybe not—it is now impossible to separate fact from legend. As with other stories from antiquity there may be elements of truth underlying the myth.

King Arthur was said to have lived in 6th century Britain and supposedly was the descendant of Joseph of Arimathea. Therefore, a higher standard of morality and behavior was expected from Arthur, and in these tales, he is meant to epitomize the ideals of honor, courtly love, servant leadership, and *Noblesse Oblige*. In a total reversal from past notions of rulership, the king was expected to rule for the benefit of his people rather than merely for himself and his cronies, as unfortunately was and still is typical of many leaders. The Round Table (Figure 7) symbolized the equality of all the knights who sat around it (the table had no "head") and that everyone was worthy of being heard. It did not eliminate royal power but placed limitations on it and directed it to serve others rather than being merely self-serving.



Figure 7. The Round Table of King Arthur.

This model for the noble and proper use of power became the essence of chivalry and the core around which these poems and stories were woven. For example, here is the knight's pledge from *Le Morte d'Arthur*:

Then the king established all his knights, and to them that were of lands not rich, he gave them lands, and charged them never to do outrageous-ity nor murder; and always to flee treason; also by no means to be cruel, but to give mercy unto him that asketh for mercy, upon pain of forfeiture of their worship and lordship of King Arthur

for evermore; and always do to ladies, damosels, and gentlewomen succour; upon pain of death. Also, that no man take no battles in a wrongful quarrel for no law, nor for no world's goods. Unto this were all of the knights sworn of the Round Table, both old and young. And every year they were sworn at the high feast of Pentecost.

Despite these high ideals, Mallory's story of King Arthur exposes the baseness and sinfulness of humanity—it begins in treachery and ends in betrayal and tragedy. It starts with Arthur's father, Uther Pendragon, who lusts after Igraine, the wife of the Gorlis, Duke of Cornwall. Uther asks Merlin, the master Druid, for assistance in seducing Igraine, and with Merlin's help Uther succeeds in entering Tintagel Castle on the coast of Cornwall where she lived, and then impregnating her. Her husband Gorlis was away from the castle engaged in a battle and was killed on the same night. Uther subsequently marries Igraine who then gives birth to Arthur. In some versions of the story, the baby Arthur is taken and raised by Merlin, who had forced Uther to agree to give him Igraine's first-born child as payment for his help, thus poisoning the Uther/Igraine relationship and ensuring that Uther's crimes would create strife and turmoil for him, rather than peace and satisfaction. Uther Pendragon himself dies in battle soon afterward, and as his dying act he thrusts his sword into a stone. After his death the country is left without a king because no one was able to draw Uther's sword from the stone, until Arthur grows up and is able to retrieve it. This sword, the Excalibur of legend, thus proves Arthur's lineage and his right to rule.

The betrayal and tragedy at the end of the story involves the adultery of the knight Lancelot with Guinevere, Arthur's wife and queen. Arthur is forced to condemn Guinevere, but Lancelot rescues her, and in the process kills several knights of the Round Table, thus betraying his oath. Finally, the climax of the story is the fight to the death between Arthur and Mordred, Arthur's illegitimate son by his half-sister Morgan le Fey with whom he had had an adulterous fling.

The quest for the Holy Grail is thus a metaphor for Arthur's search for redemption and peace. He had established the Round Table and performed many good works as king, but these were not enough. Arthur is grieved by his own failures and seeks for something beyond this world, something both higher and deeper. The search for the Holy Grail was thus an attempt to go beyond nature and the natural world, to climb higher than the trees, to fly above the eagles, and go beyond the atmosphere. It was an attempt to pierce the magic and the limited power of the Druids as represented by Merlin and the natural world, and to seek for God and heaven.

It is very interesting that Merlin perishes from his own magic used against him by a woman. In some tales he is trapped under a stone, and in others, in an oak tree, and dies. Both of these natural elements, especially the oak tree, were symbols of Druidical power. Merlin, the ultimate Druid, is therefore slain by his own gods and destroyed by the symbols of his own religion. Druidism itself is thus seen as mortal and transient—a false hope—whereas the Holy Grail is immortal and eternal.

Arthur includes others in the search for heaven and beyond, sending his knights on the quest because, like ripples in a pond, the problems in his family affect others, and ultimately the entire kingdom—a metaphor for how the sins of leaders metastasize into the evils of society. But except for Percival and Galahad, all of the other knights fail in the Grail quest, including Arthur himself, who does not find redemption until his death. In the concluding fight with Mordred, a symbol of the evil that had arisen within his own family, Arthur kills his son, but is himself fatally wounded. He returns his sword Excalibur to the lady of the lake in Avalon, surrendering his power and authority, and then dies.

King Arthur may have been a mythical invention of Geoffrey of Monmouth (it was said that Geoffrey needed to fill in the blank spaces in the history of the 6th century). But there is some evidence that the character of Arthur was at least partially based on Artur MacAidan who was not a king, but rather a warlord of the Celts prior to the Saxon invasions that finally ended Celtic power in Britain. The Saxons gradually forced the Celts south and west,¹² and eventually wiped them out. There are hints that the last Celtic leader committed or was involved with a transgression against the people, a betrayal and/or some type of adultery, that led to a spiritual crisis in his life and to conflict in the kingdom (the real Artur MacAidan was said to have had a sister named Morgan). However, the crisis was never resolved—the Celts and Scots went into battle with the Saxons and were badly defeated. Artur was slain and Celtic power in Britain was eventually crushed, never to rise again. Thus the legendary line of Joseph of Arimathea, the Pendragons, and the Christian kings of Britain came to an end in treachery, sorrow, and tragedy.

This is the significance of the tales of King Arthur and the Holy Grail. But the story goes on: The Saxons, Angles, and Jutes who defeated the Celts in the 5th and 6th centuries were themselves defeated by William the Conqueror and the Normans in 1066. Furthermore, legend says that one day King Arthur will rise again to fight for Britain. Other countries have similar stories. For example, in Denmark there is a legend of Holger, a Danish warrior who traveled to many countries but finally came back home and fell into a long sleep. It is said that in a time of national crisis, he will

awake and return to fight for Denmark. In World War II the Danish resistance movement called themselves “Holger Dansk,” and there is a statue of him in the dungeon of Kronborg Castle (“Hamlet’s Castle”) in Helsingor, asleep with a sword in his hands, waiting for the day of crisis at the end of the world.

Sir Thomas Malory, the presumed author of *Le Morte D’Arthur*, lived during the tumultuous period in England known as the “War of the Roses,” and he wrote the story while in prison. He was charged with theft, kidnapping, and rape, but it is unclear whether he was actually guilty or whether the charges were politically motivated. In those times it was disastrous for anyone of nobility to be on the wrong political side, which Malory unfortunately was. In his story he saluted the traditions of chivalry—its highness, nobility, and devotion to protect the weak, but also decried its excesses—continual fighting, cruelty, and struggles for power. So he infused his version of the tale with both the possibilities and the sadness of the human condition.

King Arthur is therefore not merely a symbol of human nobility, failure, and the subsequent quest for God. With the inclusion of the Holy Grail, the story also becomes a paradigm for divine redemption—a symbol of Christ who died a sacrificial death so that those who seek him like the knights Percival and Galahad would find the mercy of God and live.

Contemporary Conceptions of the Holy Grail

In addition to considering the Holy Grail as the Last Supper Cup, it has also been viewed in other ways:

The Holy Grail as the Philosophers’ Stone. The concept of the Philosophers’ Stone (Figure 8) is variously defined and has its roots in the mythic past, and in alchemy, magic, and sorcery. Some allege that a version of the stone was brought to Atlantis when humanity was supposedly spawned by ancient aliens (it was said to be a square of red crystal with supercomputer properties) (Remington, 2021) but most consider it to be associated with alchemy. Alchemy is hard to define because at times it has had both physical, magical, and philosophical aspects. Various alchemical practitioners throughout history have involved themselves in only one or sometimes all of these and have defined what they did in a variety of ways. But alchemy is essentially the search for both health, wealth, and immortality, and as such it is ancient, with its roots stretching back to Babylon, Egypt, China, India, and the Islamic world.

Some practitioners of alchemy focused on promoting health, and alchemy was sometimes comingled with drugs and medical practices (until the 17th century medicine was often viewed as magic). For example, the Chinese

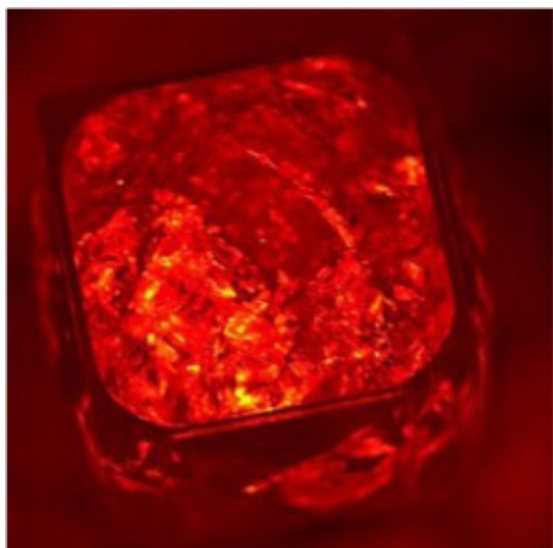


Figure 8. A representation of the Philosopher's Stone. From: Mystic Investigations, <https://mysticinvestigations.com/paranormal/philosophers-stone/>

employed colloidal gold as a drug of longevity and the word “alchemy” came from the Chinese words: kim (gold) and yeh (juice). When adopted in the Islamic world, the Arabs took the word “kimyeh” (gold juice) and added their definitive article “al”, creating the word “al-kimiya,” which then evolved into “alchemy” (Mahdihassan, 1985). Indian-Hindu medicine has long claimed antioxidant and rejuvenating properties for preparations containing gold (Sravani et al., 2017). In the 16th century Paracelsus used gold solutions to treat epilepsy (Ternkin, 1972). Later, a gold-based “cordial” was advised to manage ailments related to “decreases in the vital spirits,” such as fainting, fevers, melancholia, and epilepsy (Fricker, 1996). In the 19th century, gold was used to treat syphilis, and it was noted that gold had much milder side effects as compared to mercury, the usual medicine used against syphilis at that time (Richards, 2002). More recently medications containing gold have been used to treat rheumatoid arthritis, cancer, asthma, pemphigus, and systemic lupus, but there are also a number of potential side effects (Fricker, 1996). In the 16th century the alchemist Paracelsus wrote “Of all Elixirs, gold is supreme and the most important for us . . . gold can keep the body indestructible . . . drinkable gold will cure all illnesses, it renews and restores” (Paracelsus).

Other practitioners of alchemy focused on gaining wealth and tried to develop methods of turning base metals into gold. This aspect of alchemy was known as “chrysopoeia” meaning “the making of gold.” We now know that gold is an element and as such cannot be produced by a chemical reaction process (gold can be refined from ore but transforming other substances into gold would require

a nuclear reaction). But alchemists throughout history have tried to do so, and sometimes claimed success, although any wealth they received was from patrons and from marketing their ideas. Nevertheless, alchemists sought to make the Philosopher's Stone from the following three materials: gold (the prime ingredient), purified antimony, and flux/menstruum which is a secret liquid, said to be the universal solvent, and that supposedly is able to dissolve gold but also retain the capacity to create a crystalline substance. A successful alchemical process supposedly created a type of red-colored, colloidal, gold-antimony crystal (Medina). Movies such as *Harry Potter and the Philosopher's Stone* play on this theme.

The ouroboros and the squared circle (Figure 9). The ouroboros is an ancient symbol where infinity is represented by a serpent or dragon swallowing its own tail—the image is often used in alchemical texts from the Middle-Ages. Contained within the ouroboros is the squared circle, an alchemical symbol delineating the synergy of the four elements of matter resulting in the creation of the Philosopher's Stone (Medina).

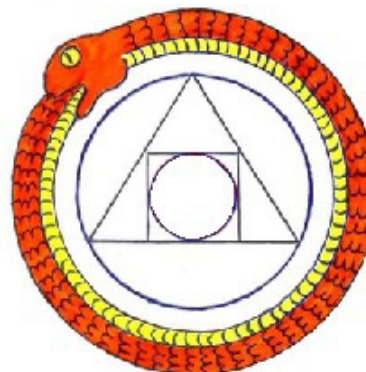


Figure 9. The ouroboros and the squared circle.

Yet other alchemical practitioners focused on the magical aspects of alchemy, which viewed the health and wealth aspects of gold as a paradigm in the search for immortality and the “elixir of life.” This aspect involves portions of the many strains of magic and sorcery, such as hermeticism, divination, theosophy, kabbalism, astral projection, necromancy, spiritism, witchcraft, etc. It is an attempt to gain spiritual and personal power through a variety of methods—seances, casting circles, invoking spirits, and so on.

Another way of viewing the Philosopher's Stone is in purely philosophical and metaphysical terms. According to this view stones and grails don't actually exist, rather they are simply an extended metaphor for a search for meaning (Ball, 2020). In contemporary Western culture this search is especially poignant because God is said to not exist, or

if He does exist then He is irrelevant, so heaven and the afterlife, and perhaps even alchemy and magic, don't really exist either. Science has become God and the scientific pursuit to understand more about the nature of matter and energy has become the grail quest for some. Darwinian evolution has thus become very important as a supposedly scientific replacement for God (Sorensen, 2010). It is certainly important to find new cures for diseases¹³ and to develop better technology, and some would quote the phrase, "It's better to travel hopefully than to arrive." But how can we travel hopefully if we're just on a road with no ultimate or meaningful destination? Is that all there is to life? Others would view Buddhism and Eastern Mysticism as the "grail quest." For Buddhists God is pantheistic and impersonal, and life is viewed as "samsara"—the wheel of suffering. In order to escape we must follow the eight-fold path and somehow live a perfect life so that we can eventually enter nirvana which means that we will be absorbed into the cosmic all (Sorensen, 2021).

The difference between viewing the Holy Grail as the Philosopher's Stone vs. the Last Supper Cup is thus very significant. The Philosophers' Stone is either a humanist or a Buddhistic escape from the world and from the meaninglessness of existence without God, or it is a means to personal power, success, and achievement—to seize and gain health, wealth, and even immortality through one's own efforts. Thus it appeals to the desire to be the "sole captain of our fate" and accountable to no one, dismissing God as irrelevant and unnecessary. We cannot prove or disprove the existence of God, so whatever we believe about the spiritual realm is a matter of faith. In contrast, the Last Supper Cup is an admission of spiritual poverty and the need for the grace of Christ—that health and wealth in this life are a matter of personal effort and discipline, but that we cannot control the spirits and that immortality is only from above. In effect the alchemist/magician says, "I did it!" while those drawn to the Last Supper Cup say, "God did it!"

The Holy Grail as Mary Magdalene. This concept sees the Biblical character of Mary Magdalene (Figure 10) as the Holy Grail. The idea was first proposed in the 1982 book *Holy Blood, Holy Grail* by Michael Baigent, Richard Leigh, and Henry Lincoln and popularized by Dan Brown's 2009 novel and the resulting movie *The DaVinci Code*. The Bible indicates that Mary Magdalene became one of the followers of Jesus after he cast seven demons out of her. She may also have been the Mary of Bethany who poured perfume on Jesus' feet and wiped them with her hair prior to his arrest and trial, as described in John 12 (there is a scholarly debate as to whether "Mary Magdalene" and "Mary of Bethany" were the same person) (Sorensen, 2011a). She then came to the tomb after his burial in order to anoint his body with spices, as was the custom of the day. However,



Figure 10. Jesus meeting Mary Magdalene after his resurrection. From: Jesus revealing himself to Mary Magdalene, https://paintingandframe.com/prints/william_brassey_hole_jesus_revealing_himself_to_mary_magdalene-5220.html

he had already risen from death and appeared to her—she was the first person to see him after his resurrection.

Holy Blood, Holy Grail goes much further and indicates that Mary was in love with Jesus as evidenced by the anointing scene, and that she supposedly became his wife or concubine. The book also alleges that she had one or more children with Jesus and thus her womb was a "chalice," a vessel of Christ in bearing his children. However, there is no support for this whatsoever in the Bible, or in any of the writings of Jesus' disciples, followers, or church leaders. Jesus met and talked with many women, which was unusual for a man, and especially for a rabbi, of that time. But he did this to honor and ascribe value to women and did not have any romantic motives or relationships. Given his identity of universal savior, and his role as the suffering servant, Messiah, King, and the third person of the Trinity, this would not have been possible for him.

The only possible documentary support for Mary Magdalene's alleged intimate relationship with Jesus is a confusing statement from one of the Gnostic "gospels"—the Gospel of Philip—written several hundred years later, and which stated, "The companion of the Savior is Mary Magdalene. Christ loved her more than all the disciples and used to kiss her often on her mouth. The rest of the disciples were offended by this and expressed disapproval. They said to him, 'Why do you love her more than all of us?'" Most assume that the above account, being from a Gnostic writing, is religious fiction, as the Gnostics had their own theological axe to grind. But some have taken it

literally and alleged from the above quote that Mary Magdalene was Jesus' spouse or consort. However, if that were the case, then why would the disciples, who were married men with their own wives, object to him kissing her? Even the Gnostic writings never claim that Jesus and Mary were married, nor do they claim that there was any sexual relationship or that any children were born to them. The Gnostic writings therefore do not provide any "new light" on the Biblical gospels. Gnosticism was simply one more set of theological speculations, at odds with the Bible.

Holy Blood, Holy Grail further alleges that Mary Magdalene traveled to Marseilles in France (called Massilia in Gaul at the time) by boat. As previously indicated, she and Lazarus were said to have sailed with Joseph of Arimathea, and possibly they first stopped on the island of Cyprus.¹⁴ Eventually Mary Magdalene was said to have settled near what is now the town of St. Maximin, thirty-five miles north of Marseille in the Baume mountains. It was also said that she then helped evangelize Provence (i.e., southern France). This idea seems to be supported by the many churches and shrines in Provence and the Languedoc dedicated to her, and at first glance it appears to be quite convincing. She became the patron saint of Marseille, and her supposed remains are kept at the Basilica of St. Maximin. Her coffin is in the crypt of the church, as well as her skull, which is displayed in a reliquary. The skull has been carbon dated to her general time period, and brochures in the Basilica tell the story of Mary Magdalene's voyage to Gaul as historical fact. Every year on July 22, her feast day, there is a procession in her honor, in which the reliquary is paraded through the town. In the mountains near St. Maximin is a site that is claimed to be Mary Magdalene's grotto, where she is said to have gone to pray. There are a few later accounts of the presence of Mary Magdalene and Lazarus in Marseilles. For example, Roger of Howden, who was more-or-less the official chronicler of the Third Crusade, wrote of his visit to Marseilles in 1190, and stated the following: "Marseille is a city situated twenty miles from the mouth of the Rhône, and is subject to the King of Aragon. Here can be found the relics of St. Lazarus, the brother of St. Mary Magdalene and of Martha. After Jesus raised him from the dead, Lazarus became Bishop of Marseilles." (Stubbs) (Figure 11).

As with the story of Joseph of Arimathea in Britain, ascribing the start of Christianity in France to the actions of Lazarus and/or Mary Magdalene has a powerful romantic and historic cachet that many have found irresistible, but the connection is very tenuous. According to the hagiography, a monk named Baudillon from Gaul traveled to the Holy Land on pilgrimage in the late 10th or early 11th century and brought back with him what were said to be the bones of Mary Magdalene which were then kept in Véze-



Figure 11. An artistic conception of the arrival of Mary Magdalene in Marseilles (actually at St. Maries de la Mer) from a carving in the Basilica of St. Maximin (picture by the author).



Figure 12. The Grotto of Mary Magdalene in the Baume Mountains above Marseilles. From: St. Mary Magdalene Cave, <http://decouvertes.fr/content/saint-mary-magdalene-cave>

lay, France (Derheim, 2011) (Figure 12). In 1058 the Pope confirmed the genuineness of the bones as relics and the Cluniac abbey of Vézelay was granted papal recognition, leading to a large influx of pilgrims. Vézelay grew into one of the greatest pilgrimage centers in Europe, thanks to the prestige of its patron saint, the support of the French monarchy, and its ideal location on a main route used by pilgrims from Germany to Santiago de Compostella in Spain where the relics of St. James were kept. The original location of Mary's activities, however, was Provence at the Baume grotto where she supposedly lived a monastic existence for thirty years, as well as the town of St. Maximin (the ground in that town on which St. Madeleine's Basilica was later built, was specifically mentioned in some versions of the legend as her original burial place). The status of the Provençal shrines improved considerably after 1279, when the monks of St. Maximin and the Angevin prince Charles of Salerno miraculously discovered that her

skeleton was still there after all, hidden inside an ancient sarcophagus in the crypt of the church. Thus Charles and his allies attempted and were ultimately successfully in reclaiming the saint's patronage and protection for the county of Provence and the house of Anjou (however, one of Mary Magdalene's fingers is still kept in Vézelay). The cult of Mary Magdalene in England came from the same general period, especially following the Norman (French) Conquest of 1066. There were only a few churches dedicated to her through the 10th century, but by the 15th century there were about 200, as well as an Oxford University college named for her (Reames, 2003). C. S. Lewis, the famous atheist-turned-Christian author, taught at this school, which is known as Magdalene College.

So regardless of the speculations, asserting that Mary Magdalene and/or Lazarus lived and ministered in Gaul is very tenuous. There are no early tales of the activities of either Lazarus or Mary in Gaul as there were for other evangelists, such as St. Patrick in Ireland (AD 460–500). If individuals as significant to the history of Christianity as Lazarus and Mary Magdalene had actually lived in Gaul for many years and were instrumental in the evangelization of the Celts and the Franks, there certainly would have been many stories about them from that time. The complete lack of early evidence does not definitively disprove the tale but places it in the realm of hagiography rather than fact. Victor Saxer, one of the main researchers on Mary Magdalene, has debunked this, as well as the notion that Mary Magdalene's daughter married into a Salic Frank family that eventually became the Merovingian dynasty, a key assertion of *Holy Blood, Holy Grail* (Saxer, 1959).

Since the feminist movement of the 1960s and 70s, Mary Magdalene has become a feminist totem, such as in Margaret Starbird's book *The Woman with the Alabaster Jar: Mary Magdalene and the Holy Grail*. Mary Magdalene was the first person to see the resurrected Christ and thus was said to be the "Apostle to the Apostles." She was also alleged to have been a significant preacher and evangelist in Marseilles, being the first female in that role, so she is "exhibit A" for those who believe that the church has misogynistically suppressed women. As the feminist goal is for women to be made equal to or exceed men in power and authority, there have been concerted attempts to ground these desires in history and archaeology—to demonstrate how women have been methodically suppressed throughout history and show that there were ancient matriarchal and socialistic societies that worshipped a goddess. Feminist works such as *The First Sex* by Elizabeth Davis, *When God was a Woman* by Merlin Stone, and *The Chalice and the Blade* by Riane Eisler, allege that Christianity kept women down which ultimately resulted in the myth of the "nine million burned witches" who were said to be "goddess worshipers

and keepers of an ancient flame" (Sorensen, 2020). However, efforts to establish feminism on an historical basis have been completely unsuccessful, as indicated by Philip G. Davis in his monumental work *Goddess Unmasked: The Rise of Neopagan Feminist Spirituality*,

Not a single [ancient society] provides clear evidence of a supreme female deity; not a single one exhibits the signs of matriarchal rule, or even of serious power-sharing between the sexes; not a single one displays social egalitarianism, non-violent interpersonal and interstate relations, and ecological sensitivity which we have been led to anticipate. In each of these cases, the story of the Goddess is a fabrication in defiance of the facts. (Davis, 1998, pp. 83–84)

One would think that goddess worshipers would be distressed that their religious concepts are based purely on concocted fallacies. However, in accordance with their roots in 19th century Romanticism, these individuals "feel" rather than "think," because thinking is largely logical, left-brained, and therefore male. They subordinate thinking beneath feeling when there is a conflict between the two. As Davis further indicates:

Virtually none of the Goddess books deals directly with factual challenges to their story. Instead, we are most likely to encounter one or both defenses to the Goddess: the irrelevance of men and their opinions, or the irrelevance of truth itself. (David, 1998, p. 85)

Thought and logic (i.e., evidence and arguments that demonstrate the fallacies and deceptions of feminism) is thus a-priori misogynistic and anti-female and can safely be vilified and ignored (the word "misogyny" has been re-defined to mean "anyone who opposes feminism"). As the legal scholar Ann Scales stated, "Feminist analysis begins with the principle that objective reality is a myth" (Scales, 1990).

Regardless of how one feels about Mary Magdalene, there is no evidence whatsoever that she was the bride of Christ, that she challenged men for leadership, or that she was ever a leader in her own right in the vein of male leaders (Sorensen, 2011a). Her essence was submission and obedience rather than power and control. Jesus ennobled women, gave them value equal to men, and involved them in his ministry, all of which were revolutionary for his day. But at the same time he supported male leadership (all of the Apostles were men) and traditional sex roles (e.g., John 4:3-30).

Viewing the Holy Grail as either the Philosophers' Stone or as Mary Magdalene thus are both largely inventions of the 20th and the 21st centuries, despite their supposedly ancient roots. Therefore, they are "born yesterday" and do not have the historical and theological connections to the Holy Grail as does the Last Supper Cup.

The Actual History of the Last Supper Cup

The grail history begins with the Last Supper, followed by the crucifixion of Christ, and the actions of a religious leader named Joseph of Arimathea. The Bible tells us that Joseph was a wealthy man and a member of the Sanhedrin, the ruling Jewish religious council in Jerusalem. Joseph asked Pontius Pilate, the Roman governor before whom Jesus was tried, for the dead body of Christ after the crucifixion. Along with the Pharisee Nicodemus, the man to whom Jesus said, "you must be born again," Joseph took the body of Christ, wrapped it in linen burial cloths, and placed it in a new tomb that he owned. There is nothing more in the Bible about Joseph of Arimathea, and no hint whatsoever that he obtained the cup used at the Last Supper (he was not a participant), or that he was even at the crucifixion, although he may have been there.

It is possible that the actual Last Supper cup could have survived from antiquity. According to one account, in 1910 a silver chalice comprising an unfinished inner cup and a finished outer holder was dug up supposedly at the traditional site of the ancient cathedral in Antioch, the city to which many Christian Jews fled during the persecutions that followed the resurrection of Christ (Eisen, 1923). The plain silver interior bowl was then claimed to be the Holy Grail, and the elaborate shell enclosing it was thought to have been made in the 1st century to honor the Grail. But the authenticity of Antioch Chalice has been challenged, and it is now considered to be a 6th century cup or more likely a standing lamp in commemoration of Christ's words "I am the light of the world" (John 8:12). In any case, there is no record of it being proclaimed as the Last Supper cup before the 20th century when that was done to increase its sale value (Wood, 2008).

According to another account, the Last Supper cup is now located in Spain (Sevilla & Ortega del Rio, 2015). This cup was supposedly seen by pilgrims in Jerusalem in the Church of the Holy Sepulcher beginning in the 400s after that church was constructed under the sponsorship of St. Helena of Constantinople. According to parchments recently discovered at a university in Cairo, after the Muslim takeover of Jerusalem in the 7th century, the cup was given to the emir of Dénia in Spain by the Fatimid Dynasty, and then to Ferdinand I, King of León, who gave it to his daughter Doña Urraca of Zamora. It is now known as the Cup of

Urraca.

One of the problems here is that we have no idea if the cup seen by pilgrims in the Church of the Holy Sepulcher was indeed the Last Supper Cup, or whether it was a replica made later. According to Torres and Ortega del Rio, the first known account that specifically mentions the cup was from AD 570 (Sevilla & Ortega del Rio, 2015). The account also mentions the presence of the sponge and the reed (employed during the crucifixion to give Christ a drink of sour wine), as well as pieces of the cross. But considering the death threats and immense pressure that Christ and the disciples were under at the Last Supper, is it reasonable to think that they would be concerned about the cup used during the seder dinner, which was probably one of several and the property of whoever owned the premises? The same thing is true of the sponge, the reed, and pieces of the cross. On the afternoon of the crucifixion the sky was black, there was a violent storm, and then an earthquake. Also, Roman soldiers controlled the crucifixion, and Jesus was considered to be a common criminal—given the fact that the cross was probably re-used by the Romans for other crucifixions, how reasonable is it that the reed, sponge, and pieces of the cross would have been saved by anyone? Thus, it is much more likely that those items were made during or after the construction of the Church of the Holy Sepulcher, and when it was opened to pilgrims. Throughout history people have desired to have both spiritual and physical elements of religion—to be able to handle and touch actual objects of their faith. So the original intent was probably not to deceive—like pieces of artwork they were meant to be tangible things that could be a focus of devotion, and an aid to visualizing the sufferings of Christ. It was only over time that they acquired the cachet of being genuine which led to the later mania for relics such as "pieces of the true cross," and then to the cynicism with which relics are treated in modern times.

But a more serious problem with the Cup of Urraca as the source of the Holy Grail literature is that the Kings of León never mentioned this relic and it has remained essentially unknown. This is in contrast to the Sudarium of Oviedo, which is the cloth or "napkin" said to cover the head of Christ (the bloodstains on the Sudarium correspond to the Shroud image), and which was brought to Spain in the 6th century. Therefore, it is highly unlikely that this cup could have inspired the Grail stories, regardless of its authenticity. The Cup of Urraca may indeed be ancient, but if so it is probably the relic made for display in the Church of the Holy Sepulcher as indicated above.

There is also no historical indication that the Last Supper cup was used to catch Christ's blood during or after the crucifixion. That was purely a literary concept first stated by Robert de Boron as described above. But there was an

object which did contain the blood of Christ, namely the linen cloths or shroud that was used to wrap his body in the tomb. The shroud is also a relic, and like the Cup of Urraca we should be suspicious and exercise caution about its authenticity. But unlike the relics mentioned above, the shroud contains an unusual image of the entire body of a man who was crucified in the same manner as Jesus. The image is so complex that to this day no one has been able to explain it. Furthermore, there is much historical evidence that the shroud was preserved and still exists—it is known as the Shroud of Turin. It is the author's contention that the Shroud of Turin (Figure 13) is the actual object behind the literary tradition and myths of the Holy Grail.



Figure 13. Face on the Shroud of Turin. From: www.shroud.com

The History of the Shroud of Christ, later known as the Shroud of Turin

As discussed above, The Holy Grail as the Last Supper cup is a literary invention, and its use as the literal grail object is either fictional or is based on another object. There are others who have also proposed that the inspiration for the Holy Grail was actually the Shroud of Turin, such as Ian Wilson (1978)¹⁵ and Daniel Scavone (1996, 2010).¹⁶

But the ideas presented here were independently developed through research for my *Unholy Grail* novel series (Sorensen, 2007a, 2011b) in the period of 1997 through 2007 and are the most comprehensive treatment.

After the body of Jesus was placed in the tomb, a large stone was rolled in front, the tomb was sealed by the order of Pontius Pilate, and soldiers guarded it. When various people came to the tomb the following day, the soldiers were gone, the stone was rolled away, and the tomb was open and empty, except for the linen cloths or burial shroud which had been left behind. The Bible mentions that the Apostle John saw these cloths in the tomb after Christ's resurrection (John 20:3-8)

There is no known historical record of exactly what became of the burial cloths, but there are traditions that an image had appeared on the shroud, a picture of Jesus' body presumably burned into it by the power of the resurrection.

Table 1 lists significant events in the history of the Shroud. The next 8 sections provide extensive details on its history during specific time periods.

Historical Evidence of the Shroud in the New Testament

Woven articles such as shrouds were expensive in ancient times, and the burial cloths used to wrap the body of Christ had been provided by Joseph of Arimathea, a wealthy man who had also supplied the tomb (graves carved out of rock were also expensive). As indicated above, Joseph may have been related to Jesus, and if so, he would have had a right to claim and bury the body. He was both a follower of Jesus as well as a member of the Jewish religious hierarchy, and therefore was thought of as a traitor by the latter, especially because of the mysterious circumstances surrounding the disappearance of Christ's body for which Joseph had made the burial arrangements. The Bible doesn't tell us what happened to him, but he would certainly have been a marked man. Assuming that the cloth was in his possession, he may well have given it to someone else for safekeeping.

The question has been posed of how the ancient Jews buried their dead. Authorities generally believe that the deceased were dressed in their own clothes (Long, 2013). (Many of the following historical references are drawn from John Long's extensive summary of the Shroud's history.) Shroud researcher Dr. Gilbert Lavoie noted that in the Code of Jewish Law from the 16th century, that an individual who died a violent death with blood flowing "should not be cleansed, but they should inter him in his garments and boots, but above his garments they should wrap a sheet which is called sovev [a shroud]." This is a tradition that some Jewish scholars believe goes back to the New

33	Jesus is crucified, buried by Nicodemus and Joseph of Arimathea in burial cloths and a tomb provided by the latter, and then rises from the dead. The burial clothes are mentioned as being seen in the tomb.
ca. 33–38	The burial cloths (i.e., the shroud) is brought to Edessa by Thomas or Thaddeus, and King Abgar V is miraculously healed. Edessa becomes a Christian city. A mosaic tile was made of the face on the Shroud (known as the Keramion) and placed over the city gate. In addition to the Shroud, this tile may have been the model used for future pictures of Christ.
57	Ma'nu VI becomes king of Edessa and reverts the city to paganism. The Shroud and the Keramion are hidden in the city walls to protect them from destruction, and the location was forgotten.
177–212	Abgar VIII ("The Great") becomes king of Edessa. He was a Christian and sought to find the roots of Christianity in the city, but the Shroud was still hidden. He is probably the literary source of the story of King Abgar V.
525	The Shroud and the Keramion are rediscovered during the rebuilding of Edessa after a flood.
544	Edessa is besieged by a Persian army and the Shroud and/or the Keramion purportedly save the city. Following this, the Hagia Sophia church (named after its analog in Constantinople) is constructed to house the Shroud/Keramion and venerate them. The Shroud is shown to the public every Easter, but in an air of secrecy and mystery.
544–944	The appearance of Christ as depicted in Christian art suddenly changes from smooth Greco-Roman to a Semitic man, with the characteristics of the face from the Shroud and/or the Keramion. Syriac artists become the main source of Christian art.
944	One hundred years after the end of the iconoclastic controversy the Byzantine emperor, Romanus Lacapenus has his army sent to Edessa to bring the Shroud and later the Keramion to Constantinople (a copy of the latter was probably brought). The Shroud was received with great ceremony and paraded through the city.
944–1204	The Shroud and Keramion are kept in the imperial relic treasury and periodically presented to private audiences.
1204	The knights of the 4 th Crusade come to Constantinople, supposedly on their way to Jerusalem, but due to a complex and unfortunate series of political events, they sack the city instead. Both the Shroud and the Keramion disappear.
1204–1355	This period is known as the "missing years" of the Shroud, and there are a number of theories as to its whereabouts during that time. The two most popular are, 1) The Shroud was taken by one or more members of the Knights Templar (it may have remained in Constantinople for some period); 2) The Shroud was given to the knight Othon de la Roche, a knight from the Burgundy region of France who became the Lord of Athens in Greece. The Shroud may have been in Greece but was eventually brought to Besançon, the capital of Burgundy. In any case the Shroud eventually became the property of Geoffrey de Charny and his family.
1355	Geoffrey de Charny, a high counselor to King John II the Good of France and the Lord of Lirey and Savoisy, had built a chapel in Lirey to commemorate his rescue from the English. He and/or his wife Jeanne displayed the Shroud to the public and had pilgrim medallions minted to commemorate the display.
1389	Pierre D'Arcis, the Bishop of Troyes, wrote the <i>D'Arcis Memorandum</i> in which he complained to Pope Clement VII that the Shroud being shown in Lirey was a painting and a fake. However, this memorandum has been debunked.
1400–1454	Margaret de Charny, the granddaughter of Geoffrey, allowed the cloth to be publicly viewed on a number of occasions during the period 1400–1453. In 1454 she sold the Shroud to the Duke Louis I of Savoy and received from him the castle of Varambon and revenues of the estate of Miribel as payment.
1464	The sale of the Shroud by the de Charny family to the Savoys is detailed in a document in the Paris archives. Some years later a history of the Savoy family recorded that Louis' acquisition of the Shroud was his greatest achievement.
1464–1578	Later generations of the Savoys periodically displayed the Shroud, built churches to house it, and often took the Shroud with them when they traveled. It was shown in public many times in various places, and was finally moved to Turin, Italy, in 1578.
1694	The Shroud was placed in the Guarini Chapel in Turin where it remains to this day.
1898	The first photograph of Shroud was taken by Secondo Pia, and it was then noticed that the Shroud was a negative image.
1902	The first medical examination of the Shroud image was done at the Sorbonne by Yves Delage and associates.
1978	The STURP research team did an extensive series of tests on the Shroud which demonstrated that it is not an artwork (i.e., not a painting, photograph, block print, rubbing, or any other known artistic technique).
1983	Umberto II, the ex-king of Italy and legal owner of the Shroud, died. In his will he bequeathed it to the Pope and his successors, with the stipulation that it must remain in Turin.
1988	Samples from the Shroud were carbon-dated to the Middle Ages (from the period 1269–1390). However, the results were challenged, and the dating process has been discredited.
2002	The Keramion was discovered in the archives of a museum in Edessa.
2022	Threads of the Shroud were dated with x-ray technology to the time of Christ.

Testament era (Wilson & Miller, 1986). Therefore, if a man died naked as did Jesus he would then be wrapped only in a shroud. Aside from a few fragments, no other known ancient burial cloths from Israel have survived, so we do not have any comparative samples.

Larry Stalley's article referenced below indicates that there are a number of possible references to the shroud in the New Testament (Stalley, 2020), but there are several reasons why there are no direct references to what happened to the burial cloths:

1. Among the Jews, articles associated with the dead were unclean—even stepping on a tomb without realizing it required ritual purification. Burial shrouds would therefore not generally be handled or displayed.

2. The Jewish authorities very much wanted to conceal the fact that Jesus' body had disappeared, and they paid the guards of the tomb to lie about what had happened (Matthew 28:11-15). The Roman authorities would also not want any evidence that Jesus had escaped from the crucifixion that they had performed. So if the existence of such an object became known, it would probably have been seized and destroyed by either the Jews or the Romans.

3. Extreme suffering in those times was considered to be the judgement of God, whereas wealth, military might, and power were typically viewed as marks of God's approval. A good example is the book of Job, possibly the oldest in the Bible, in which Job suffers a series of calamities and winds up sitting in ashes and scraping his boils. His friends could not understand how a wealthy and upright man as he had been could ever experience such disaster—when bad things happened to you it had to mean that God was against you. Therefore, people could easily have wondered how attractive Christianity could be when its founder, the son of God, was displayed as dying in such a humiliating and gruesome manner. A different mindset was required for the Christian message to be understood and appreciated.

4. Related to the previous item is the issue of oriental sensitivity. Christ as depicted on the Shroud is brutally beaten, wounded, and dead. He is also naked, and all of these characteristics were not just disagreeable to the society of that era, they were abhorrent, especially to spiritual and ascetic minds of that time. Even after understanding the message that Christ had suffered and died for the sins of humanity, it was another matter to reveal the grisly details. As a man from Syrian Edessa expressed it:

When he was stripped, the sun and the moon blushed with modesty. As soon as Christ was stripped, all creatures were covered with darkness . . . all creatures wept and cried out with anguish

. . . Since He who clothes all creation was made naked, the stars hid their light" (Savio, 1982).

Rev. Edward Wuenschel, one of the first American Shroud researchers, noted that early Christian artists were very reticent to depict Christ and the crucifixion realistically until after the 13th century, and then only in the West:

Now on the Shroud the effects of Christ's crucifixion are visible in all their stark reality, more vivid and more appalling than in any artistic work. . . . It is reasonable, therefore, to suppose that the Shroud was kept more or less hidden for centuries and a prudent silence observed about its imprint. . . . Those who imagine that the guardians of the Shroud should have gone about waving it like a banner show little understanding of the Christian Orient. (Humber, 1978)

So in conservative regions such as Judea and Syria there was little chance of the Shroud being fully displayed in public, and this was also true of the somewhat more liberal Constantinople when the Shroud was eventually brought there.

Historical Evidence of the Shroud Circa 33–525

A large number of the disciples and other church members left Jerusalem in the persecutions that took place during the period AD 33–67, and during the destruction of the city by the Romans in 67–70. The destination for many was either Antioch, a large city in Turkey on the southeastern coast of the Mediterranean Sea, or Edessa, another city in Turkey around 150 miles to the east.¹⁷ Edessa (now known as Şanlıurfa or simply Urfa) is called "The Blessed City" and "The City of Prophets." According to Muslim tradition, the Biblical figures of Jethro, Job, Elisha, and Abraham lived there or in the surrounding region. Nearby is the ancient town of Harran, reputed to be the birthplace of Abraham and the town from which he set out on his journey to Canaan as described in Genesis 12:1-9 (Dayvault, 2016, p. 108). The population of the area included Syriac, Greek, Armenian, and Arabic speaking peoples as well as a strong Jewish representation.

There are two significant documents providing information about the possibility of the shroud being taken to in Edessa soon after the resurrection of Christ: the *Acts of Thaddeus* written in Greek, and the *Doctrine of Addai* ("Addai" is the Syriac version of "Thaddeus" or "Thomas") from the early 4th century written in Syriac.¹⁸ As mentioned above, they tell the story of King Abgar V Ouchama who

ruled the Osrhoene province of Edessa during the time of Christ, from 4 BC to AD 7, and then again from AD 13 to 50 (Osrhoene was a buffer state between the Roman and Parthian empires until AD 216 when it became a Roman colony). The story is clearly hagiographic, as it has elements of legend, but also has an historical basis.

Abgar was said to be suffering from gout and leprosy and had apparently heard of the healings and miracles that Jesus was performing in Israel, so he sent an emissary requesting medical help. Jesus was said to have washed his face and wiped it on a cloth on which the image of his face appeared. He then sent one of his disciples to Edessa along with the cloth, which was referred to as a *mandylion* (handkerchief). But in the *Acts of Thaddeus* the Mandylion was described, not as a handkerchief, but rather as a cloth which was a *sindon tetrádiplon*, or “burial shroud folded in eight parts” where only the face of Christ would be visible. It also indicated that the facial image on the cloth was extremely faint, like a “moist secretion without pigments or the painter’s art” and this describes what the shroud actually looks like (Scavone, 1996). Scholars have questioned if King Abgar knew that it was a full-length burial cloth or if it was simply a towel or handkerchief. A 10th century codex containing an 8th century account indicated that an imprint of Christ’s body was left on a canvas kept in a church in Edessa, and that “King Abgar received a cloth on which one can see not only a face but the whole body” (Savio, 1957).

Abgar was then gradually healed (Guscini, 2009). In that time cities would typically have a statue of its patron god or goddess placed by the city gate and all travelers entering the city were required to stop there and worship the deity before proceeding into the city (Whanger & Whanger, 1998). After Abgar was healed, it was said that he had the statue of Edessa destroyed; he then replaced it with a mosaic tile bearing the face of Christ which was mounted over the city gate (Wilson, 1978). This tile was known as the “Keramion” a word derived from “ceramic” which in turn came from the Greek *keramikos* or *keramos* (Dayvault, 2016, p. 146). Abgar converted to Christianity as did the rest of the city, which along with Antioch then became one of the first Christian communities outside Jerusalem.

After Abgar’s death in AD 50 his son Ma’nu V became king. However, the latter died soon afterward and his brother or son Ma’nu VI came to the throne in 57. He reverted to paganism, persecuted Christians, and sought to destroy all of the associated relics. Therefore, Edessa became hostile to Christianity until the rule of King Lucius Abgar VIII 120 years later. The Shroud and the Keramion were hidden within the city walls by church officials and forgotten for more than 460 years (Dayvault, 2016, p. 66).

The *Doctrine of Addai* indicates that the King Abgar story was found in the archives of Edessa, and apparent-

ly placed there by King Lucius Abgar VIII (177–212), known as “The Great.” This later King Abgar was a Christian and may have inserted the story of the earlier King Abgar into the Edessan archives as a way of demonstrating an earlier Christian connection to Edessa. He had no doubt heard of the shroud, but it had disappeared and was not rediscovered until three centuries after his time. Therefore, he had never seen it, hence the story of the Mandylion (Figure 16) as an attempt to explain the healing and conversion of the Abgar V in the 1st century by an image of Christ. Lucius Abgar appointed and consecrated Palut as Edessa’s first bishop in 200, and he sought to promote Christianity but without forced conversions. Bardaisan, a contemporary of the king, wrote of the efforts of the latter to replace paganism in his *Dialogus de Fato*. There is also a church in Edessa that dated from 201, which was built after the Daisan River flood mentioned below (Segal, 1970, p. 24). But this was an era of confusing heretical variations of Christianity, and disputes concerning the humanity and divinity of Christ were not settled until the Council of Nicea, which took place a century later in 325. Lucius Abgar therefore sent a letter to the church in Rome, asking for missionaries to come and preach the faith in his city.

This was also a time before the papacy in Rome actually existed. There were churches in Rome established during the 40s AD and these churches had leaders, but it was not until after the Edict of Milan in 313 that the papacy truly began (the first true pope was Sylvester I, 314–335). Nevertheless, Abgar’s letter came to Eleutherus (175–189) the leader of the Roman church at that time, and the correspondence was later recorded in Rome’s 6th century *Liber Pontificalis*—the deeds of the popes (Duchesne, 1886; Loomis, 1916; Harnack, 1904). King Abgar VIII was also a friend of Rome (he added “Lucius” to his royal name in honor of the Roman emperor Lucius Septimius Severus). The Roman historian Dio Cassius (150–235) further wrote that this King Abgar paid a state visit to Rome in the time of Eleutherus (Cary, 1927).

This reference in the *Liber Pontificalis* was the source of the error made by the Venerable Bede, the English author mentioned above, which led to a fictional British King Lucius and to Bede’s account of the early Christianization of Britain. A similar confusion came from the misinterpretation of another early document: Clement of Alexandria, one of the Fathers of the early Church who lived during the same time as Lucius Abgar VIII, wrote that “Thaddaeus and Thomas were buried in Britium Edessenorum” by which he meant “in the Birtha of the Edessenes.” The Daisan River flows around the city of Edessa, and at times it became a raging torrent. In 201 it spilled over the walls and devastated the king’s palace. Many people died in the flood and the king rebuilt his palace on high ground, hence the Syri-

ac word “Birtha” being used to describe it. That word was transliterated into Latin as “Britium” and misinterpreted as meaning “Britain.”

The *Doctrine of Addai* further states that this earlier Abgar sent agents on a mission to the Roman governor at Eleutheropolis in Israel. However, this can only have come from Lucius Abgar’s time, since it was only about AD 200 that the Roman emperor Lucius Septimius Severus renamed the town of Beth Gubrin as Eleutheropolis, to celebrate his granting of municipal status to its people.

Thus the stories of the 1st century King Abgar V in the *Acts of Thaddeus*, the *Doctrine of Addai*, and other writings are clearly hagiographic and are often characterized as legend. J. B. Segal, perhaps the most prominent historian of Edessa, referred to them as, “One of the most successful pious frauds of antiquity” but also added “Nor, indeed, should we reject as wholly apocryphal the account of the conversion of King Abgar to Christianity; the legend may well have a substratum of fact” (Segal, 1970, pp. 69–70). So a more reasonable version of the story is that either Thomas (the doubting disciple of Jesus in John 20:24–29) or Thaddeus (one of the seventy disciples of Christ), brought the shroud bearing Christ’s image to Edessa sometime after the resurrection and during the period of Christian persecution, perhaps around AD 38. Joseph of Arimathea was reputed to have connections in Edessa and may therefore have given the cloth to Thomas or Thaddeus who then performed a miraculous healing of Abgar in the same vein of the healings done by Christ. Abgar then sought to Christianize Edessa and had the Keramion made and placed over the city gate. There is little doubt about the early presence of Christianity in Edessa as well as a cloth showing the face of Christ, which at that time was referred to as the Mandylion (Philip; Barnard, 1968).

Aside from the documents mentioned above, there are other early references to the Shroud. The 2nd century apocryphal *Gospel According to the Hebrews*, somewhat respected by early Christian writers, indicated that Jesus gave his shroud to “the servant of the priest,” or as some scholars suggest, “to Peter.” Other apocryphal books from the same time period such as *Gospel of the Twelve Apostles*, the *Gospel According to Peter*, and *Mysteries of the Acts of the Savior* all mention the Shroud and its whereabouts (Long, 2013).

However, some believe that the Shroud was instead brought first to the city Antioch (Markwardt). This ancient city is now a pile of ruins near Antakya in Turkey, but at the time of Christ Antioch was the third-most important city of the Roman Empire, and it was the location mentioned in the Bible as the primary destination of Christian Jews fleeing from the persecution in Jerusalem (e.g., Acts 11:19–30; Edessa is not mentioned in the Bible). For example, Nico-

las of Antioch was one of the first deacons appointed by the Jerusalem church; after Stephen was stoned to death around AD 37 (Acts 6:8–8:3) and the intense persecution of Christians by the Jewish establishment in Jerusalem began, Nicolas and others moved to Antioch. By the middle of the 1st century, there were two distinct Christian churches there—one primarily for Jews and the other for gentiles. The city also sponsored the great missionary efforts of Paul and Barnabas. The Apostle Peter also lived in Antioch for a while before traveling to Rome, and he may have been the city’s first Bishop. St. Nino, the woman who visited Jerusalem from Antioch in the 4th century, wrote that the burial cloth of Jesus was preserved by Pilate’s wife, given to St. Luke, and then given to the Apostle Peter (Markwardt). However, that cloth may have been the “napkin” that covered the head of Christ, and which later became known as the Sudarium of Oviedo as mentioned above. Unlike Edessa which became hostile to Christians after 57, Antioch long continued as a center for Christianity and therefore would be the most logical place for the relics of Christ to be kept. Christians also suffered there later during the long periods of Roman persecution, so relics such as the Shroud would have been hidden, as in the Edessan story. But given the fact that Christians were welcomed in Edessa for some period of time, as well as the stories of Abgar V and the later rediscovery of the Shroud as described below, the Antioch hypothesis is much less likely (Scavone, 2010).

Historical Evidence of the Shroud 525 to 944

In 525 the city of Edessa was again flooded by the waters of the Daisan River and many people were killed (an account gives the number of 30,000) (Hamdy & Reinach, 1982). This was the same period when fires and an earthquake destroyed most of the city of Antioch. When the walls of Edessa were eventually torn down and rebuilt, the Shroud and the Keramion were rediscovered (Wilson, 1979, pp. 138–139), and to the people of Edessa it was the “lost cloth of legend” (Long, 2013). Then in 544, around twenty years after the flood, a Persian army attacked, perhaps because the city’s defenses had not yet been fully restored. Evagrius, the author of *Greek Ecclesiastical History*, written about 595, tells the desperate attempts to stave off the ensuing siege. When the Persian army built a large wooden siege ramp, the Edessans mined under it in an attempt to burn it down but were not successful. According to Evagrius, “So, when they came to complete despair, they brought the divinely created image, which human hands had not made, the one that Christ the God sent to Abgar . . . Then, when they brought the all-holy image into the channel they had created and sprinkled it with water, they applied some

to the pyre and the timbers. And at once . . . the timbers caught fire." The siege ramp was destroyed, and city saved. According to Evagrius, Edessa was protected by a "divinely wrought portrait" (acheiropoietis) sent by Jesus to Abgar. The cloth was said to be a "holy palladium" with protective properties (Markwardt, 2000). After the Persian invasion had been thwarted, the king of Persia requested that the cloth be used to heal his sick daughter (Drews, 1984, p. 58).

Edessa's main cathedral had also been destroyed in the flood of 525, and a church was built after the attempted Persian invasion to house the Shroud and the Keramion. It was named the "Hagia Sophia" after the famous church that had also been recently built in Constantinople. Like its analog in Constantinople, the Edessan cathedral was said to have been beautiful beyond description, with gold plating, glass, and marble (Segal, 1970, p. 189).

The *Liturgical Tractate*, a 10th century Greek text, describes the Edessan rituals and indicates that no images were permitted in the Hagia Sophia cathedral except the Icon (i.e., the Shroud and/or the Keramion). The Shroud was highly revered but kept in great secrecy—folded in eight, stored in a chest in its own sanctuary, and guarded by an abbot (Wilson, 1979, p. 145). However, every Easter it was shown to the public, but in a secretive way. The Tractate states, "Then, on the Sunday before the beginning of Lent, there was held a special procession in which the Image, still enclosed in its chest, was carried through the cathedral accompanied by twelve incense-bearers, twelve torch-bearers, and twelve bearers of flabella or liturgical fans" (Wilson, 2000, p. 222). The chest in which the Shroud was kept was allowed to be opened and the Image seen only by the archbishop. It was equipped with shutters which were opened on rare occasions, "then all the assembled throng gazed upon it; and every person besought with prayers its incomprehensible power" (Drews, 1984, p. 38). But this was done at a distance through a grille at the entrance of the sanctuary, making it difficult to see the face very well (von Dobschütz, 1899). The Tractate further states, "No one was allowed to draw near or touch the holy likeness with his lips or eyes. The result of this was that divine fear increased their faith, and made the reverence paid to the revered object palpably more fearful and awe-inspiring" (Wilson, 1979, p. 146). During the 1st hour of the ceremony (6 a.m.) Jesus' image was displayed as an infant, at the 3rd hour (9 a.m.) as a child, at the 6th hour (noon) as a youth, and at the ninth hour (3 p.m.) as the crucified Christ (at that point the shroud image was shown) (Scavone, 2010). Exactly how this display was done is not known, but it prefigures a similar ritual done later in Constantinople, as described below.

In reading the *Tractate*, Historian Robert Drews concluded that details make it apparent that "we are dealing

with an object of some size, and not with a small, unframed cloth that the wind could lift and carry" (Drews, 1984, p. 37). Other documentary references include the 1994 translation of Georgian texts found at St. Catherine's Monastery in Egypt which confirmed old Georgian traditions that Assyrian monks evangelized Georgia in the 6th century. Theodosius, one of the monks, was from Edessa where he was "a deacon and monk [in charge] of the Image of Christ," a reference either to the Shroud and/or the Keramion (Wilson, 2010, pp. 135–136). Theodosius and a companion were tasked to paint religious art and are rare examples of known individuals engaging in "icon evangelism" during this era. Additionally, the 6th century *Syriac Acts of Mar Mari the Apostle* (believed to be an early evangelist to the Assyrian region) briefly records the miraculous origins of the Icon (Harrak, 2005). Jesus is said to have made his image on a "sdwn" (linen cloth) (Drijvers, 1998, pp. 21–26).

Syriac documents and traditions continue to shed light on the Image for the next three centuries. An unpublished mid-7th century letter addressed to Nestorian Christians in Edessa was recently disclosed by Archbishop Gewargis Silwa, head of the Church of the East in Iraq, which called Edessa "a sanctified throne for the Image of his adorable face and his glorified incarnation" (Wilson, 2000, pp. 34–35). The Jacobite Patriarch Dionysius of Tell-Machre (a town near Edessa) in the 8th or 9th century records that he remembered the Image of Edessa being in the hands of the orthodox Christian community going back to the late 6th century. His recollections are similar to those of the *Acts of Mari* and tell of Jesus making his "swrt" on a "shwshae-pha" (piece of cloth or towel) (Drijvers, 1998, pp. 21–26). These accounts are almost identical to the image creation account in the *Acts of Thaddeus*. Dionysius recalled a story told to him by his grandfather of how a clever artist, in the employ of the Edessan Athanasius bar Gumoye, had made a copy "as exactly as possible [of the original] because the painter had dulled the paints of the portrait so they would appear old" (Segal, 1970, pp. 213–214). His testimony of having to "dull the paints" suggests the faint negative image of the Shroud face. Other early 8th century texts make it clear that the Edessan Image was a continuing and important religious object. The Church where it was kept was referred to as "The House of the Icon of the Lord" in manuscript BL Oriental 8606 dated to 723 (Drijvers, 1998, p. 28). Another was an unpublished 8th century text known to scholar Hans Drijvers recording a dispute between a Christian monk and an Arab wherein the latter admits he has heard of the image made by Christ and sent to King Abgar (Drijvers, 1998, p. 27). In 730, St. John Damascene, in his anti-iconoclastic movement thesis, *On Holy Images*, describes the Shroud as a *himation*, which is translated as an oblong cloth or grave cloth (perhaps the first docu-

mentary reference to it being a burial shroud) (Dreisbach, 1995). Pope Stephen II (752–757) who probably knew of the King Abgar story, described the Shroud as follows: “Christ spread out his entire body on a linen cloth that was white as snow. On this cloth, marvelous as it is to see . . . the glorious image of the Lord’s face, and the length of his entire and most noble body, has been divinely transferred” (Dreisbach, 1995). Thus, there is a wealth of documentary references to the Shroud being in Edessa in the 6th century and following.

It is well known that in the first few centuries of the Christian era Christian art depicted Jesus in a variety of ways, but most frequently as beardless, in the style of a Greek or Roman man. However, this changed in the 6th century to a more Semitic appearance (beard, moustache, shoulder-length hair parted in the middle, and usually front facing) that was then passed down through the centuries to us today. The model for these are probably the facial image from the Keramion which was in turn based on the Shroud. Some of the earliest of this new type are mosaics in Ravenna, Italy (Wilson, 1979, p. 102) made by Byzantine artists, and which date to the 540s. Ian Wilson noted that conventional academia had no accepted explanation for this change other than “the Byzantine tendency at this period to create rigid artistic formulae that then became the pattern for future generations” (Wilson, 1979, p. 103), but where did this “rigid artistic formulae” come from? In the 1930s the French researcher Paul Vignon observed twenty or so facial peculiarities, subsequently called “Vignon markings,” in many representations of Christ from the 6th century and following. In his opinion, the earliest was found on copies of a mysterious eastern icon, the “Image of Edessa” (Walsh, 1963). These appeared to have little or no artistic function, but nevertheless corresponded to markings on the Keramion and the Shroud, suggesting that it may have been a model for this new version of Jesus’ face. Wilson subsequently recast the markings of Vignon into fifteen characteristics including an open top square on the forehead, one or two “V” shaped markings near the bridge of the nose, a raised eyebrow, accentuated cheeks, an enlarged nostril, hairless area between lips and beard, and large eyes. No picture included all these characteristics, but some contained many of them. Wilson also noticed that a few of them, especially from the forehead, were to be seen on pictures of other saints, probably placed there as a sign of holiness (Wilson, 1979, pp. 104–105). Other significant artworks noted by Wilson include the mosaic in St. John Lateran and a painted panel in the Sancta Sanctorum Chapel of the Lateran Place, which were called *acheiropoietos*, indicating that the model was an image “not made by hands” (Wilson, 1979, pp. 142–143). Some researchers have expressed reservations, noting that non-Christian



Figure 14. Icon of Christ Pantocrator from St. Catherine’s Monastery. [https://en.wikipedia.org/wiki/Christ_Pantocrator_\(Sinai\)](https://en.wikipedia.org/wiki/Christ_Pantocrator_(Sinai))

pictures sometimes have similar markings, but they are so frequently used for the face of Jesus that a Shroud-related model is likely to have been employed.

A good example of the “true likeness” of Jesus is the 6th century Christ Pantocrator from St. Catherine’s Monastery (Figure 14). The Pantocrator or “Christ Enthroned” and sitting in majesty as ruler of the world, was a significant artistic type and a preferred means of depicting him in that era. Dr. Alan Whanger and his wife Mary developed a technique for overlaying and comparing pictures, and then counting the points of congruence (Whanger, 1985). When applying an overlay of the face from the Shroud onto the St. Catherine’s Pantocrator, the Whangers counted 170 points of congruence (they note that 45 to 60 points are sufficient to prove common identity in a court of law) (Whanger & Whanger, 1998, pp. 33–34). This is also true of many other pictures, icons, and images on coins dated from the 6th century onwards. They noted that Christ’s face on one 7th century coin from Constantinople (the Justinian II tremissis) is particularly significant as it was not “naturalized” as other coin images to show what a living Jesus would actually look like. A comparison with the Shroud face strongly suggests that the designer was more concerned with reproducing the image from the Shroud (the Whangers counted 188 points of congruence between the two). In 1979 the sindonologist Gilbert Lavoie visited retiring Harvard University professor Dr. Ernst Kitzinger, one of the giants in Byzantine art history, who made this surprising admission: “The Shroud of Turin is unique in art. It doesn’t fall into any artistic category. For us, a very small group of experts around the world, we believe the Shroud of Turin is the Shroud of Constantinople. You know that the

crusaders took many treasures back to Europe during the 13th century, we believe that the shroud was one of them” (Lavoie, 2000, pp. 73–74).

In contrast to contemporary artists to whom individual expression is all-important, ancient iconographers typically sought to empty themselves of all individualism so that they could create an accurate copy of the model they were using. After prayer and fasting, they would attempt to capture the essence of subject of their work without adding any personal interpretation, as the original was considered to be holy. Thus all of the details of the model would be replicated as accurately as possible, which is why the face on the Shroud and the Keramion (Figure 15) were



Figure 15. The mosaic tile from Edessa believed to be the Keramion.

duplicated with such exactitude (Dayvault, 2016, p. 143).

In 2002 Philip Dayvault traveled to Şanlıurfa in Turkey, the city formerly known as Edessa, to research ancient oil lamps. He was able to gain approval to do research in the basement archives of the main archaeological museum in Şanlıurfa, and there he found what is believed to be the actual Keramion—the mosaic tile created between AD 30 and 50 and placed over a city gate in Edessa (Dayvault, 2016, pp. 124–134). The mosaic is the face of Christ, so it is known as the “ISA Tile” (Jesus is “Isa” in Arabic) with a limestone backing as if it had been mounted on a rock facing and then hacked off (Dayvault, 2016, p. 161 image). The tile was made in the style of an “*emblema*” which is a picture done in mosaic and was frequently used in ancient times for decorating walls or pavements. It was created with small colored tesserae aligned in curving patterns resembling worms, therefore this type of mosaic is known as *opus vermiculatum*. After such mosaics are finished and

dried, they are applied to a stone backing with an adhesive.

Dayvault thinks that it originally had “nimbus” elements over the head of Christ representing his divinity which were broken off by Muslims (they are not allowed to keep representations of Christ, so images of Jesus are often identified as being the Biblical Nimrod) (Dayvault, 2016, p. 179). It was sold to the museum in 1972 by an unknown party, and therefore had probably been kept in the Edessa area throughout its history (Dayvault, 2016, pp. 138–139).

Still standing outside Şanlıurfa are sections of the walls and the western gate of ancient Edessa—the gate through which Thaddeus (Figure 16) was reputed to have entered the city from and over which the Keramion had been placed by King Abgar V. Dayvault found a cave near the top of the wall where the Shroud and the Keramion were said to have been hidden from AD 57 to 525. Within the cave were places where these objects could have been placed (Dayvault, 2016, pp. 220–241). Over the gate was an area of missing stone from which the Keramion could have been removed (Dayvault, 2016, pp. 281–292), but the cave has since been closed off to visitors by Moslem authorities (Dayvault, 2016, p. 269). Dayvault also did extensive comparisons of the ISA tile face to the Shroud as well as to ancient icons and art works described above (Dayvault, 2016, pp. 164–219) and indicated, “Subsequent research determined forensically that the ISA Tile had served as the model for numerous ancient, classical depictions of Jesus Christ” (Dayvault, 2016, p. 136). Thus the Keramion was probably the model used by artists in both Edessa and



Figure 16. A 10th century a painting showing Thaddeus presenting the Shroud which displays the face of Christ, and King Abgar V holding it (Huntsidway, 2014).

Constantinople in the production of sacred art.

The face of Christ from the Keramion and therefore from the Shroud thus became the de facto model for Christian art after 544 (Figure 17). Ian Wilson theorized that some unknown artist studied the face on the Shroud (or more likely the Keramion), made model drawings including the peculiarities noted by Vignon, and then sent copies to others who were engaged in creating religious art (Wilson, 1979, p. 105). The art historian O. M. Dalton noted, "It was the Aramaeans [Syrians] who counted for most in the development of Christian art" including "the cities of Edessa and Nisibis, where monastic theology flourished" (Dalton, 1925). He also stated, "The East had always one advantage over its rival [Hellenistic West] . . . it was the home of monasticism, the great missionary force in Christendom. . . . Monks trained in the Aramaean theological schools of Edessa and Nisibis flocked to the religious houses so soon founded in numbers in Palestine. From the 5th century it was they who determined Christian ico-



Figure 17. *Discovery of the Mandylion*, painting made in 1678 by Fedor Zubov and now in the Moscow Kremlin Museum. It depicts the discovery of the Shroud and the Keramion in Edessa. <https://www.shroud.com/pdfs/Akathist%20to%20the%20Holy%20Mandylion.pdf>

nography" (Dalton, 1925, p. 9).

Thus the cloth known then as the Holy Image of Edessa is a documented certainty no later than the 6th century. But it was almost always kept folded with only the face

visible, and hidden, and the secrecy and mystery involved in handling the Shroud is of great importance in understanding its history—why its identification as the Shroud of Turin has been difficult, and also why this object later fired the imagination of many.

In 2009 the board of the Central Bank of Armenia adopted a new design for their AMD 100,000 Dram bank note (Figure 18). The obverse depicts King Abgar V pointing to a flag bearing a portrait of Christ, and the reverse shows the disciple Thaddeus presenting the Shroud to King Abgar and his family. The latter was taken from a 1580s painting by the Dutch painter Matthijs Bril (Dayvault, 2016, pp.



Figure 18. Armenian bank note with images of Christ and the shroud. <https://www.banknoteworld.com/armenia-100-000-dram-banknote-2009-p-54-unc.html>

249–251).

Historical Evidence of the Shroud 944–1204

The emperor Constantine moved the capital of the Roman empire from Rome to the city of Istanbul in AD 330, renaming it Constantinople after himself. The Roman empire collapsed in the latter part of the 5th century, but Constantinople retained its greatness. In the Middle Ages it was surrounded with high walls, located on the "Golden Horn," and was like a remote and impregnable fairy-tale palace. As a center of art, culture, and commerce it was unrivaled, having preserved the knowledge and experience of the old Roman Empire. Trade poured into it from all quarters, and its palaces, churches, and shrines were the envy of the world. Vikings from Scandinavia who eventually became known as the "Rus" and the founders of Russia

called the city “Mikligard” (the great city), and they grew rich from their trading voyages from Novgorod, down the Dnieper River, to the Black Sea, and then on to Constantinople. What is considered to be the first Russian state was established in Kiev on the Dnieper near the end of the 10th century, which is now the capital city of Ukraine.

Constantinople retained its prominence as one of the major cities of the world for many years. It was also the capital of Byzantium and the seat of the Greek Orthodox Church until it was conquered by the Muslims centuries later in 1453. Moslem forces did take Edessa in 639 and then advanced on Constantinople. But their attack failed, and the city was eventually able to recover. Then the iconoclastic (“image breaking”) controversy of the 8th and 9th centuries took place by those who took the Second Commandment very literally, and much of the empire’s religious art was destroyed.¹⁹ Finally, supporters of iconography, led by the imperial family, triumphed in 843 and pictures of Christ and the saints reappeared. So in 943 in order to celebrate 100 years of the “Triumph of Orthodoxy” the then Byzantine emperor, Romanus Lacapenus, sent an army to Edessa to recover the famous Image from the Moslem infidels. The Muslims in Edessa were ill-prepared for an attack, but the general of the Byzantine army offered the city’s Muslim Emir the promise of immunity from further attack, a sum of money, and the freeing of 200 Moslem captives and for just one thing—the “Mandyion cloth” which was provided. Even so, the Christian population of the city resisted, and a crowd followed the withdrawing Byzantines in protest (Wilson, 1979, pp. 147–150). When Moslem Turkish forces destroyed the Christian civilization in Edessa 200 years later in 1146, they apparently searched for the Shroud and the Keramion. “For a whole year they [the Turkish looters] went about the town digging, searching secret places, foundations, and roofs” (Wilson, 1979, p. 151).

The Shroud was brought to Constantinople on 15 August 944 for the purpose of “obtaining a new and powerful force of divine protection” (Markwardt). The Shroud was first brought to the Church of St. Mary Blachernae in the city’s northwest corner. After celebrating the Mass for the Assumption of the Virgin, a small group of clergy and nobility saw the Shroud, and this event was recorded by a painted miniature, the first of many done over the next 200 years. The 10th century writer Symeon Magister reported that the emperor’s two ruffian sons, who were in attendance, “could see nothing but a [faint] face,” but their brother-in-law and future emperor Constantine VII (an artist himself) could discern various facial features (Scavone, 1989, p. 86). The following day it was officially welcomed, in the words of a contemporary history, with “high psalms, hymns . . . and boundless light from torches” among “a procession of the whole people. . . . It is impossible to de-

scribe in words all the weeping for joy and the intercession, prayers, and thanksgivings to God from the whole city as the divine image . . . passed through the midst of the city” (Wilson, 1979, p. 152). The Shroud’s arrival was thus celebrated with processions, and it was placed in the Pharos Chapel, the imperial treasury for relics located in the palace of the emperor. There is a surviving eyewitness account of that day—the *Narratio de Imagine Edessena*. Gregory Refrendarius, archdeacon of Hagia Sophia in Constantinople, was a member of the clerical committee that arranged for the reception of the Shroud, and in a sermon dated 16 August 944, he mentioned that it was a full-length image of Christ and carried his bloodstains. He even noted the piercing of Christ’s side (Guscin, 2004).

The date of the Shroud’s procession into Constantinople (August 16th) became a feast day and was added to the Orthodox calendar. For the first anniversary a detailed history of the Shroud was written, possibly by the new emperor, Constantine VII. This history was called the “Story of the Image of Edessa” and is the first lengthy description of its survival for 900+ years, as well as being an eyewitness account of its reception the previous year (Wilson, 1979, pp. 272–290). Also known as the “Festival Sermon” it claimed to be based upon “painstaking inquiry into the true facts” from historians and Syrian traditions (Wilson, 1979, p. 273). The Story indicates that King Abgar V suffered from arthritis and leprosy and had heard of Jesus and his miracles. So he sent a messenger to invite Christ to live in Edessa and heal him. Jesus declined but promised to send a disciple after he had returned to his Father; he also “washed his face in water, wiped off the moisture that was left on the towel that was given to him, and in some divine and inexpressible manner had his own likeness impressed on it.” But the author of the Story also discusses another version—that when Jesus was in the Garden of Gethsemane “sweat dropped from him like drops of blood” (Wilson, 1979, p. 278). Thaddaeus was the disciple sent by Christ and he brought the Image to Edessa. Abgar could see “that it did not consist of earthly colors,” to which Thaddaeus replied, “the likeness was due to sweat, not pigments.” The Story goes on to describe that King Abgar put the cloth on a board decorated with gold, and the city was evangelized by Thaddeus while Abgar lived. But under the kingship of his grandson, Christians were persecuted, and the Image had to be hidden within a gate of the city and was then forgotten. Then in 544 during the siege of the Persian army, a bishop had a vision in which the location was revealed, and the Icon aided in the victory described by Evagrius. Another version of the Festival story indicates that “Bishop Eulalius found the icon and the tile [i.e., the Keramion] on which the cloth had miraculously copied itself . . . and Eulalius frustrated the efforts of Chosroes and the Persians, and

Edessa was saved" (Drews, 1984, p. 56). Historians generally dismiss the Story's account of the Shroud's history, but it appears to have been a serious attempt by its Byzantine author to understand its unusual nature and describe its mysterious past.

The Keramion had a somewhat different history. It was allegedly ordered to be brought from Hierapolis, a city near Edessa, to Constantinople in 966 or 968 by Emperor Nikephoros II Phokas, in other words after the Shroud had already been brought there (Dayvault, 2016, p. 159). But a copy of the Keramion may have been brought instead, as the original found by Dayvault as described above was from the Edessa area. Dr. Alexei Lidov, a professor of art history, explains how the Shroud and the Keramion were eventually placed, and the impact this had on Eastern Orthodox churches' "cross-in-square" design: "The two images of Christ—the Mandylion and the Keramion . . . were placed at the apex of the east and west domed arches, exactly opposite each other. . . . The Mandylion-Keramion paradigm is an almost obligatory feature in order to create a sacred space within the church... This unique placement has been replicated in Orthodox churches since at least the 11th or 12th centuries. . . . Nowhere, however, is there to be found an adequate explanation for this unusual juxtaposition of the two most ancient miraculous images of Christ" (Lidov, 2006, pp. 17–18, 24). In regard to placement of the Shroud and Keramion facing each other, Lidov further indicates, "Edessa could serve as such a highly esteemed prototype because it was the only earthly city which formerly received the protection and blessing of Christ himself, expressed to King Abgar. From this point of view, the status of Edessa could be compared to that of Jerusalem" (Lidov, 2006, p. 26).

As described above, the Shroud was kept in a case and folded so that only the face was visible. In addition to the factors mentioned above concerning oriental sensitivity, the authorities in Constantinople had another potential issue: The Abgar story indicated that the cloth contained only an image of Jesus' face. This was apparently solved by either by imprinting a facial image on another small piece of cloth (a Mandylion or handkerchief is also recorded as an independent object in the relic repository) (Wilson, 1978, p. 166), or by using the Keramion (the Edessan mosaic made in the time of King Abgar V) as a shroud representation, i.e., as an icon. Dr. John Jackson, one of the members of the 1978 Shroud of Turin Research Project team (STURP), noted that there are a series of fold marks occurring at one-eighth length intervals on the Shroud of Turin, "which argue strongly for the identification of the Shroud as the Mandylion" (Jackson, 1995, p. 303) (Figure 17). The frequent reference to the "Icon of Christ" may therefore refer to the Keramion, which was a mosaic image of the face of

Christ based on the Shroud. Painted pictures of the Shroud became standard in most eastern churches, and most of the early depictions show Jesus' face in a circular opening of what appears to be an ornate, trellis pattern slipcover or reliquary, similar to how the Shroud was stored (Wilson, 1991, p. 25 a–d). It first appeared in the lists of relics held at Constantinople in 1093 as "the linens found in the tomb after the resurrection" (Wilson, 1998, p. 272). Louis VII, King of France, visited Constantinople in 1147 and reportedly venerated the Shroud, and other visitors and pilgrims during the 11th and 12th centuries left several reports of the "linen cloth with the Lord's face on it," but noted that the object was kept hidden and available only to the emperor (Wilson, 1998, p. 181). In 1201 it was spoken of by Nicholas Mesarites, the overseer of Constantinople's treasury of relics, who wrote, "in this place the naked Lord rises again, and the burial sindons can prove it" (Wilson, 1998, p. 272). Mesarites' description is particularly compelling because of his indication of the nudity of the Shroud figure, which was never done in artistic renderings of Christ.

The Hungarian Codex (Figure 19), dated about 1143, contains a picture of the Shroud displaying the herringbone weave of the cloth as well as burn marks that can currently be seen on the Shroud (it has survived three known fires). The artist employed in 1143 must therefore have been



Figure 19. The Hungarian Codex.

viewing the same cloth that exists today. 1143 is around two hundred years before the date indicated by the carbon dating process of 1988 (Klotz, 2016).

There were several written testimonies of crusaders who saw the Shroud when they came to Constantinople during the 4th crusade, including the knight Robert de Clari, who noted the following:

There was a Church which was called My Lady Saint Mary of Blachernae, where there was the shroud [syndoinēs] in which Our Lord had been wrapped, which every Friday, raised itself upright so that one could see the form of Our Lord on it, and no one either Greek or French, ever knew what became of this shroud [syndoinēs] when the city was taken. (Peter, 2014)

The Shroud was apparently used in a ceremony for private viewing as indicated by de Clari, where it was gradually raised and revealed throughout the day—first the face and finally the entire body (Long, 2010). It thus gained an audience, but it was still considered a sacred object, held in great reverence, and not viewable by the public. Despite its extensive impact, the essence of the Shroud remained elusive. This is reflected in the many terms used to describe it, such as *acheiropoietos* (not made with hands), *mandylion* (handkerchief), *mantile* (towel or tablecloth), *santa toella* (holy towel), *icon* (picture), *imago* (image), *lintheum* (linen cloth), *manutergium* (hand towel), *ektypoma* (figure in relief), *tetrádiplon* (four-doubled or folded in eight), *soudarion* (face cloth), *spargana* (swaddling cloth), *panni* (cloth or garment), *fasciae* (bandage or girdle), *othonai* (linen cloth), *sindon* (fine linen cloth), and *syndoinēs* (burial shroud) (Long, 2010). This confusion was due to several factors:

1. The first story of the Shroud was about King Abgar V and the circumstances of how Christianity was brought to Edessa. The disciple Thaddeus was said to have come there after the resurrection of Christ and healed Abgar with a cloth that had the facial imprint of Jesus. In this story the Shroud was described as a *mandylion* (handkerchief), but the story was probably written by King Lucius Abgar VIII over 120 years later. This was at a time when the Shroud and the Keramion were still hidden, so the latter Abgar only had the traditions that had been passed down to him.

2. The Shroud was typically folded in eight parts (*sindon tetrádiplon*) with only the face visible, so it would have appeared to people as a towel or handkerchief if they had seen it.

3. In a day long before graphics and photography, paintings and mosaics were the primary artistic mediums of oriental societies. As previously noted, after the rediscovery of the Shroud and the Keramion, artistic representations of Christ immediately changed to the more Semitic Shroud face, but more likely they were based on the Keramion (the Shroud is a faint negative image, and therefore

much harder to use as a general model than the Keramion). The latter was therefore probably the model used for the production of religious art in both Edessa and Constantinople. The sacred image of Christ was sometimes described as an “icon” and sometimes as a “burial cloth.” This confusion can be resolved by understanding that the two objects were kept together in both the Hagia Sophia of Edessa as well as in the churches and chapels of Constantinople. So references to the Image of Christ as an “Icon” may refer to the Keramion.

Historical Evidence of the Shroud 1204–1355

Jerusalem had been taken from Moslem hands in 1099 by the knights of the 1st Crusade but was retaken by the forces of Saladin in 1187. A 2nd Crusade (1147–1149) and then a 3rd (1189–1192) had been attempted to recapture Jerusalem but were unsuccessful, so in 1202 a 4th Crusade was organized. But due to a series of unfortunate political events, most of the crusaders never reached the Levant. Transport for the voyage was provided by the Venetians, but they demanded much more than the crusaders could pay. So to compensate Venice the crusaders attacked a Christian town that was a Venetian rival and sacked it. In response, the Pope excommunicated the crusaders, but that information was concealed from the army. As the crusade continued, it was in great need of funding, so the leadership entered into an agreement with the Byzantine prince Alexios Angelos to temporarily divert the army to Constantinople and restore his deposed father Isaac II Angelos to the throne. The intent of the crusaders was then to continue to Jerusalem with the aid promised to them by the Byzantines. On 23 June 1203, the main crusader army reached Constantinople, and several months later Alexios was crowned co-emperor, but in January 1204 he was deposed by a popular uprising and murdered the next month. The Byzantines had long been regarded in the West as duplicitous, so with their patron dead and then being treated as potential enemies, in disgust the crusaders attacked Constantinople and by April 1204 they captured and plundered the city’s enormous wealth. Only a handful of the crusaders continued to the Holy Land. According to historian Sir Steven Runciman, “There was never a greater crime against humanity than the Fourth Crusade” (Runciman, 1954, p. 130).

Relics would sometimes be paraded through the city during times of danger or stress. When in 1037 a severe drought threatened the city “Emperor Michael IV personally carried the Image of Edessa in procession to the Church of the Virgin at Blachernae to plead for rain (Wilson, 2010, pp. 178–179), and the Blachernae Church was apparently

a rallying point for the city. In 1204 the Shroud may then again have been brought forth to reassure the frightened population, and thus was captured by the crusaders.

During the sack of Constantinople both the Shroud and the Keramion vanished as indicated in the quote from de Clari above. There is no indication of what happened to the Keramion and it disappeared from history (i.e., the version kept in Constantinople), but, regarding the Shroud, Theodore Ducas Anglelos, a crusader legate, wrote a letter to Pope Innocent III in 1205 in which he stated:

The Venetians partitioned the treasure of gold, silver and ivory, while the French did the same with the relics of saints and the most sacred of all, the linen in which our Lord Jesus Christ was wrapped after His death and before the resurrection. (Dreisbach, 1995)

With the Shroud disappearing from Constantinople, tantalizing rumors circulated in Europe of a holy object that contained the blood of Christ, especially because most of the crusaders returned home rather than continuing the Crusade. Around the year 1211, the English lawyer and chronicler Gervase of Tilbury wrote his monumental *Otia Imperialia*, remarking in one passage:

The story is passed down from archives of ancient authority that the Lord prostrated himself with his entire body on whitest linen, and so by divine power there was impressed on the linen a most beautiful imprint of not only the face, but the entire body of the Lord.

As indicated above, the grail romances were written in France during this general period and became enormously popular, and the mystery surrounding the Shroud made it even more interesting and compelling. The Shroud then disappeared from view for a period of 150 years following the sack of Constantinople which are referred to as the “missing years.” There are a number of contradictory theories that have been advanced to explain the Shroud’s whereabouts during this period—none of them are conclusive because of the lack of definitive documentary evidence (many church records were later destroyed during the French Revolution of 1789 which was very hostile to religion), but the most compelling theories are as follows:

1. The Knights Templar (Figure 20), one of the most esoteric organizations in history, was associated with the Shroud during this time. The Knights were founded at some point during the period 1113–1118 as a group of initially nine men who dedicated themselves to protect pilgrims traveling to Jerusalem in the aftermath of the first crusade.

Figure 20. A warrior of the Knights Templar. From: www.eternalma.com



In 1128 they were proclaimed a religious order free from secular authority and answerable only to the Pope. Their rules of life as a monastic military group were written by St. Bernard of Clairvaux²⁰ and patterned on the same rules used for the Cistercian order of monks. Because of the public’s intense interest and devotion to the crusades, many donated land and resources to the Templars and sent their sons for training, with the result that the order became very wealthy and influential. The fact that the Muslims had conquered North Africa, Palestine, Spain, the Balkans, Sicily, Southern Italy, invaded France, and had persecuted Christians on pilgrimage to the Holy Land created a large outpouring of support for the Crusades as a means of avenging those defeats. In 1095 Pope Urban II preached to large crowds in support of the 1st Crusade, and when in 1146 Bernard of Clairvaux preached the 2nd crusade in Vézelay, France, an audience of more than ten thousand people came to hear him including King Louis VII of France. The anti-Muslim fervor for crusading lasted for 200 years (1095–1291), with a total of eight official crusades as well as minor ones. The *Reconquista* in Spain to expel the Moslem Moors continued until 1492.

2. It has been alleged that the Knights Templar were, at some point in their history, the keepers of the Shroud and/or the Holy Grail, and given the above evidence that may very well have been the case. Ian Wilson, the most prolific of all Shroud researchers, believed that no text is authoritative of those that profess to document the Shroud during the missing years (Wilson, 2010, p. 198). He concluded that due to the length of time, a group rather than an individual must have been responsible, and that they must have been wealthy with no need to sell or reveal the relic.

By the time of the crusader conquest of Constantinople the Templars had grown large and wealthy (as well as secretive and arrogant) by providing very dependable banking services and investing in numerous other profitable enterprises. The only form of currency at the time was gold and silver, either in bar or coin form, and travel in those times was hazardous with brigands and highway robbers a common problem. Smaller groups were thus hesitant to take sums of money with them. The Templars had precep-

tories (fortified storehouses) in various locations in Europe and the Levant and were the first group in history to provide long-distance banking services, which became a model for later organizations such as the Hanseatic League. For someone who wished to travel, for example, between Paris and Rome, the individual would give gold to the Templars in Paris and receive an elaborate signed receipt. Upon reaching Rome they would surrender the receipt and get back their gold, less a fee. The Templars were thus unwittingly the inventors of paper money, as the receipts eventually became a convenient form of currency. They also had a reputation for scrupulous financial honesty, and harshly treated any member for theft or embezzlement.²¹ Wilson observes “the Order was able to act as guardians, traders and pawnbrokers for the flourishing trade in relics, genuine and false alike, that ensued after the Fourth Crusade.” he also noted that some Templars conducted secret, late night mystery rituals venerating “a certain bearded head, which they adored, kissed and called their Saviour” which may have been the Shroud, even though the rank and file may not have been fully aware of it (the Templars were spread over a wide geographical area) (Wilson, 2010, p. 198). Among the accusations brought against various Knights during their later trial was that they worshiped the head or face of a man, which was called “baphomet.” One of these paintings on a wooden panel still exists in Templecombe, a Templar preceptory in Somerset England, and bears a striking resemblance to the face on the Shroud, although the picture may not have originated from the Templars (Ritchie).

The Templar’s growing wealth, their arrogance, and their penchant for secrecy eventually created powerful enemies, as they operated outside the bounds of the existing political entities of their day. By the 1300s Templars operated many businesses and owned huge estates in France, all of which were free from royal taxation. The French King Philip IV le Bel who despite his “le Bel” moniker (meaning “the fair or beautiful”) was a cruel and avaricious man. The French crown had borrowed heavily from the Templars to finance various military conflicts and Philip wanted to avoid repayment. Also at the beginning of the 14th century, Pope Clement V, fearing attack, moved the papal court from Rome to Avignon in France, beginning the period known as the “Babylonian Captivity” of the Papacy. Clement V was essentially a pawn of the French king, so in 1307 Philip forced him to revoke the papal charter of the Knights Templar and officially disband them. The king then repudiated his debt to them, confiscated all of the Templar assets he could lay his hands on, and had all of the Knights in France arrested and put on trial.²² Seven years later in 1314, the king had Jacques de Molay, the Grand Master of the order, and Geoffrey de Charny, the Preceptor of Nor-

mandy, burned at the stake.²³ There is a story that de Molay cursed both the king and the pope from the flames; both of them died later the same year. Meanwhile, the Templars scattered and some of them fled to Scotland where they reputedly assisted Robert the Bruce in his struggle against the English. Other Templars crossed the Alps into what is now the country of Switzerland, and it is said that they founded the Swiss banking industry with its penchant for financial secrecy, as well as providing military expertise (Butler & Dafoe, 1998). But the story of the Templars coming to either Scotland or America in boats laden with treasure is a myth. As is the case with contemporary banks, most of their resources were illiquid in the form of real estate, loans, and businesses, so stories about their hidden wealth such as the 2004 movie *National Treasure* are interesting but also mythical.

In 1355, a second Geoffrey de Charny, the nephew²⁴ of the de Charny who was burned at the stake with Jacques de Molay in 1314, was revealed as the first documented owner of the Shroud. De Charny and both his wives, as discussed below, were descendants of the crusader forces which looted Constantinople and/or participated in its later administration. There are no known documents describing how de Charny received the Shroud, but he built a chapel in Lirey, France, to house it and made it available for public viewing. Like his uncle, he was probably a member of the Knights Templar, and therefore the Shroud may have been a family heirloom taken from Constantinople during the Fourth Crusade by an ancestor of his family and kept throughout this period at one of the Templar preceptories.

After the events of 1307–1314 when the order in France was destroyed, the remaining Templars continued in far greater secrecy. The Shroud could have been in the possession of the de Charny family or close relatives during the entire period. The latter Geoffrey de Charny was a man of honor and great influence in France—a counselor to King Philip VI and his son, King John II. De Charny was captured by the English after the Battle of Calais in 1349 and ransomed by King John II in 1351. However unlikely, some have suggested that he had the Shroud with him while he was a prisoner and that he hid it in the Templecombe preceptory mentioned above during the period of his captivity. It was also suggested that the wooden panel on which the painting was made was originally the cover of a box in which the Shroud was transported.

In 1350 during the period of the Black Death which killed a large percentage of the population of France, John II “the Good” became king. He attempted to establish a new Templar-like organization called the “Order of the Star” devoted to the same chivalric ideals. Geoffrey was among 500 knights from across France called to join, and apparently was one of its main leaders. It has been speculated

that Geoffrey may have sought to revive the Templars with plans to use the Shroud to rally influential knights (Wilson, 1979, p. 198). Several years later, de Charny was back in combat for his king, and he was given the highest honor of carrying the Oriflamme, the banner of the king, into battle. He was killed at the Battle of Poitiers in 1356, shielding King John II from the attack of the English, and when he fell the Oriflamme was still in his hands (Viardi, 1899; Vidier, 1907–1910). Many other French knights died with Geoffrey, spelling the doom of the Order of the Star as well as the end of 1300 years of quasi-secret Shroud possession. The cloth's owners then decided to share it with the wider Christian public.

3. According to Greek documents (Crispino, 1982, p. 27), the Shroud could have been kept in Constantinople for some period of time and later passed on to French King Louis IX ("Saint Louis"). After de Charny's chapel was rebuilt in the 16th century, a manuscript was composed testifying that: "The members of the [Lirey] chapter assert that Geoffroy I, after his liberation from the English, received the Shroud at Amiens from Philip VI." A tablet placed in the church added, "Geoffroy, knight, Count of Charny and lord of this place Lirey . . . received from King Philip as recompense for his valor, the Holy Shroud of Our Lord . . . to be placed in the church which he hoped to build" (Scavone, 1993, pp. 208–209). Scholars have challenged these assertions, but it is known that after the events of 1204, Baudouin II de Courtenay, the third emperor of Constantinople, was desperate for cash to pay his army (a perennial problem for medieval rulers). In the years between 1237 and 1247 he obtained loans from the Venetians and his cousin, King Louis IX of France, and in return, gave up many relics which were delivered to Louis' new Sainte-Chapelle church in Paris. These reportedly included a *sanctam toelam tabule insertam*, a "holy towel inserted in a frame" (Crispino, 1985, p. 25). In giving the Shroud to de Charny, King Phillip may have provided what he thought was only an odd, faint painting of Jesus' face. If so, then the Shroud was a de Charney family secret which could explain their documentary silence. Perhaps after they discovered that they had Christendom's greatest relic, they would rather the king not learn the astonishing truth and demand its return. For the next one hundred years they and Geoffrey's granddaughter, Marguerite, kept the details secret (Crispino, 1988, pp. 30–31).

4. The Shroud could have been taken by family members of Jeanne de Toucy, the first wife of Geoffrey de Charny. She was the niece of a churchman in the Cathedral of Reims, and some of her family were said to be friendly with the emperor in Constantinople. She died around 1350, and in 1352–1353 Geoffrey de Charny married Jeanne de Vergy.

5. The group who took possession of the Shroud may

have been the Cathars, or possibly Cathar members of the Knights Templar, who were a Gnostic sect from the French Languedoc. The Cathars had given large tracts of land to the Knights Templar, and a number of Knights had taken up the Cathar religion or became sympathetic to them, which perhaps contributed to the Templar downfall in 1307 (the Cathars were the main target of the Albigensian Crusade of 1209–1229). There were also Gnostic religious groups related to the Cathars in Constantinople at the time of the 4th Crusade in addition to any Templars with Cathar leanings. The Cathars did not believe in the literal person of Christ, and therefore were opposed to relics and would not have displayed an artifact depicting Christ's humanity and death. Nevertheless, like the Edessans and the Byzantines before them, the Cathars could have taken the Shroud from Constantinople as a palladium—a means of protection. Protection was necessary because in 1198, Innocent III became pope. He was a fanatical opponent of all groups considered to be heretical and did not hesitate to use military means to enforce his will (he was also the pope who initiated the 4th Crusade). After unsuccessful attempts to convert the Cathars, he launched the Albigensian Crusade against them in 1209 in order to eradicate them. Part of the rationale for the destruction of Constantinople had been to "rescue the relics of Christ from the Greeks," and if the Shroud, the most important relic of all, was thought to be in Cathar hands, it would have been one more reason to assail them.

There is an account of Amaury de Montfort, the Catholic leader of Albigensian Crusade, declining a Cathar invitation to come and see the body of Christ "which had become flesh and blood in the hands of the priest." Over the next several decades the Cathars were repeatedly attacked and driven back, and in 1243–1244 the Cathar leadership made a last stand at their mountaintop fortress of Montsegur in the Pyrenees. Throughout the Albigensian Crusade, the fortress of Montsegur was rumored to contain a mystical Cathar treasure that exceeded all material wealth, and which gave the fortress supernatural protection. On 16 March 1244, just preceding the final storming of the fortress by Catholic forces, it was rumored that several Cathar men escaped during the night by descending the steep and sheer western face of Montsegur by rope. According to tradition, they took with them unspecified Cathar treasures which may have included the Shroud. In the story of *Parzival*, which was written in the period 1205–1216, Wolfram von Eschenbach indicates that the Holy Grail was kept in a mountain fortress in the Pyrenees, and in another poem he named the Lord of the Grail Castle as "Perilla." At that time, Raymond de Perella was the Lord of Montsegur. The Cathar escapees from Montsegur supposedly carried their treasure to a valley in the Sabarthes region of the Pyrenees

south of Montsegur. If this story is true, the Shroud was kept there for the next 100 years by persecuted Cathars who were systematically hunted down and either killed or forced to recant by the Inquisition. Then in 1347 the Black Death swept across Europe. In some communities of southern France, more than ninety percent of the people perished, and the Languedoc, already suffering from famine and war, was devastated. Aside from isolated individuals and those who had fled to Spain, the Cathars were essentially wiped out. The Shroud was perhaps discovered among the confiscated and forfeited personal goods of a Languedoc heretical family, and Geoffrey de Charny, who had some degree of authority in that area of France, may have acquired legal title to the relic by right of royal grant.

Among the Cathars, title to the Shroud could not have legally passed from one generation to another, because according to the law of that time, heretics, their sympathizers, and their descendants were prohibited from making a will or receiving a legacy. In addition, all personal property of heretics and their descendants was subject to confiscation and forfeiture to the crown. There are records in Paris that in the spring of 1349, de Charny's royal annuity was modified to include forfeitures that might occur in the Languedoc regions of Toulouse, Beaucaire, and Carcassonne, which were all cities in the Languedoc with Cathar leanings. The Cathar hypothesis would also help to explain de Charny's silence on how the Shroud had come into his possession.

Regardless of his method of obtaining the Shroud—either by inheritance or by forfeiture from a Cathar family—he would have had to obtain papal permission to display it as the Shroud of Christ. There is a letter from de Charny to pope Clement VI in which de Charny reports his intentions to build a church at Lirey to honor the Holy Trinity, who answered his prayers for a miraculous escape in 1352 while he was a prisoner of the English, but there is no record of de Charny obtaining papal permission to display the Shroud at the church. If the Shroud had been in Cathar hands, however, the possible reasons for papal silence are compelling: Once it was understood that the Shroud may have come from a Languedoc forfeiture, it would have been clear that the Cathars and their descendants had been the Shroud's keepers since the sack of Constantinople. Disclosure of this information would embarrass the Catholic Church, raise questions about the motives for the Albigensian Crusade, create sympathy for the Cathars for preserving Christianity's most precious relic, interfere with the Church's ongoing prosecution of heresy, and possibly expose the Shroud to attack as a forgery or idol of heretics. In addition, had it become known that the cloth was only recently discovered among the personal effects of Black Plague victims, it may have aroused fear of contamination

and a call for its destruction.

Finally, disclosing the Shroud's history could have generated a demand from the Byzantine Emperor or the Eastern Orthodox Church that it be returned to Constantinople. The pope may therefore have required the perpetual silence of the de Charny family in return for allowing the Shroud to be publicly displayed, as he did later in the case of Bishop D'Arcis, as discussed below (Markwardt, 1997, 2000).

It should also be noted that the "Cathar explanation," although completely lacking in any historical documentation, provides the basis for much of the current fame of the Cathars. In the 20th century, interest in the Cathar religion was revived by Otto Rahn, the German homosexual mystic and Obersturmführer in the Nazi SS, who wrote two Grail novels that were bestsellers in Germany (*Kreuzzug gegen den Gral*, "Crusade Against the Grail" in 1933, and *Luzifers Hofgesinf*, "Lucifer's Court" in 1937). Rahn spent many years researching the Cathars and was convinced that von Eschenbach's *Parzival* was based on the Holy Grail and was an object that had been kept at Montsegur. Rahn was responsible for developing and popularizing the story of the three Cathar men who supposedly escaped from Montsegur prior to its fall in 1244 carrying with them the unspecified treasures of the Cathars. Heinrich Himmler, the head of the SS and Rahn's boss, was fascinated by the occult, and became very interested in Rahn's work. He apparently informed Hitler, who also became interested in the Grail as a divine source of power. Hitler created Nazi Ahnenerbe SS as a research institute to investigate Montsegur and the Grail. Rahn at first was a darling of Himmler, but apparently had a falling out with the German command—he resigned from the SS in 1939. Later in the same year, under mysterious circumstances, Rahn's body was found frozen to death in the Tyrolian Alps, and his death was officially ruled a suicide. His life and work was supposedly one of the inspirations of the highly popular 1981 movie *Indiana Jones and the Raiders of the Lost Ark*.

6. Despite the intriguing nature of the above possibilities, there is very little documentary evidence for them. As stated by professor and Shroud researcher Daniel Scavone, "Historiography proceeds by documents." He notes that documents suggesting a shroud remained among the Constantinople relics after 1204 are better understood that none was found, no shroud was documented as leaving the city for Louis IX's Sainte-Chapelle, no inventory ever placed it there, the Knights Templars made no claim to having the shroud of Christ, and none claimed that their idol was a shroud or even on cloth (Scavone, 2008, pp. 1–3). Therefore, the possibility with the most documentary evidence, but which is also contested, was that the Shroud was given to Othon de la Roche, a knight from the Burgundy region of France. Othon commanded the district of Blachernae in

Constantinople where the Shroud was kept, and after the sack of the city, he was said to have been given the Shroud, as well as the duchy of Athens in Greece for his leading role in the crusade (De Cremiers, 1991). Othon then became the Duke of Athens and Sparta and supposedly took the cloth with him to Greece. The above-quoted letter from Theodore Angelos to Pope Innocent III indicated that Athens was where the Shroud had been taken. The cloth was seen there according to two eyewitness accounts, by a letter of Theodore of Epirus dated 1 August 1205, and in 1206 by Nicholas of Otranto, abbot of the monastery of Casole (we “saw with our own eyes” Christ’s burial linens) (Scavone, 2008).

In 1219 an agent of the Byzantine emperor and ally of Othon went on a mission to Burgundy with a safe conduct pass and an armed guard, and it is possible that he carried the Shroud with him and gave it to Ponce de la Roche, Othon’s father. Alternatively, it could have been brought to France by Othon himself when he returned to Burgundy in 1224. His contemporary descendants still live in his castle at Ray-Sur-Saone near Besançon, and among heirlooms of



Figure 21. A box kept by the family of Othon de la Roche at the family residence of Ray-Sur-Saone. It was said to be constructed from pieces of an original box which was used to transport the Shroud to Besançon. From: <https://biblearchaeology.org/the-shroud-of-turin-list/2332-the-shroud-of-turins-earlier-history-part-four-to-little-lirey>

the family is an ornate box that according to family tradition, transported the Shroud from Athens to Besançon, as shown in Figure 21 (Piana, 2007, pp. 2–3).

It was customary for relics to be donated to local churches, and a manuscript known as “MS 826” which was placed in the Besançon archives about 1750, claims that Othon’s family passed the Shroud to Bishop Amadeus de Tramelay, the Archbishop of Besançon, to be kept at St.

Stephen’s Cathedral (also known as the Cathedral of St. Etienne) in Besançon (Scavone, 1989, p. 98). Amadeus was possibly an ex-member of the Knights Templar, as he was related to Bernard de Tramelay, the fourth Grand Master of the Templars. The Shroud was used at the cathedral in Easter and Ascension rituals from the 1200s through the mid-1300s (Scavone, 1993, pp. 194–195), but in 1349 a fire burned down the cathedral and destroyed the church records. However, before the cathedral went up in flames, the Shroud was removed.

Othon’s granddaughter, Elizabeth de la Raye, had married into the powerful de Vergy family, and her great-granddaughter, Jeanne de Vergy, married Geoffrey de Charny sometime in 1350–1353. Besançon, the leading city of Burgundy, was on the border between what at the time was France and Germany and was therefore a hotbed of politics. Located in the “Franche-Comté” region it was still nominally part of the Holy Roman Empire (i.e., Germany), but a large portion of the population, including the de Vergys, desired a union with France. Some have suggested that Jeanne, using the cathedral fire as cover, may have executed a family ploy to keep the Shroud in French hands (Scavone, 1993, p. 207). After Jeanne’s marriage to de Charny, she brought the cloth with her into his family.

Despite the additional documentary evidence for this possibility, the evidence is relatively thin and controversial. Much of this is due to fires but even more so to the destruction of church records during the French Revolution. For example, there are documents referring to a manuscript in a Spanish library indicating that Jerome Turrita, an Aragon nobleman, was present when the Shroud was given to Othon de la Roche (Scavone, 1993, pp. 192–193). Such a manuscript would be of great importance, but the original is not extant, prompting caution on the part of contemporary researchers. But in any case, the Shroud came into the possession of Geoffrey de Charny, the Lord of Savoisy and Lirey, and high counselor to the King of France.

Historical Evidence of the Shroud 1355–1400

Depending on which of the above versions of the story is chosen, Geoffrey de Charny probably acquired the Shroud at some point between April 1349 and January 1354. Either he or his wife arranged for it to be shown for the first time in Europe, beginning around 1355. He had built a church in his hometown of Lirey, a small town near Troyes in France, and named the church “The Annunciation of St. Mary” in praise to God for his 1351 rescue from the English. This was the site where the Shroud was first shown to the European public, and the first undisputed historical representation of the Shroud was created at



Figure 22. The lead medallion made to commemorate the first Shroud display in 1355. It was found in the Seine River when the river was being dredged in 1855 and is now kept in the Cluny Museum in Paris. Hundreds of assorted medallions from the 1300s were found in the mud next to the Pont au Change bridge, on the north side of the Ile de la Cite where the Cathedral of Notre Dame is situated (Foster, 2012). From: <https://biblearchaeology.org/the-shroud-of-turin-list/2332-the-shroud-of-turins-earlier-history-part-four-to-little-lirey>

that time—a small pilgrim medallion picturing the Shroud and the coats of arms of both the de Charny and the de Vergy families (Figure 22).

De Charny died in battle the following year, and Jeanne de Vergy, his widow, either began or continued the Shroud displays at Lirey. As in the case of other relics, a fee was charged to view the Shroud, possibly because Jeanne de Vergy was in financial straits after the death of her husband. Many pilgrims came to see it, and in June of 1357 twelve bishops granted indulgences to pilgrims visiting the church (Fossati, 1983, p. 25). But the Vatican had for some time attempted to curb abuses related to relics (in 1215 the 12th Ecumenical Council, Fourth Lateran, placed restrictions on the use of relics including the statement that “new ones could not be venerated without church authorization” [Piana, 2007, p. 5]), and the displays in Lirey were eventually stopped.

By 1389 Jeanne de Vergy was remarried to Aymon of Geneva, the uncle of the Avignon Pope Clement VII. The family then decided to re-exhibit the Shroud, but this required ecclesiastic approval. Due to Aymon’s influence with the Pope, they appealed directly to the papal legate, Cardinal Pierre de Thury, circumventing Pierre d’Arcis, the local Bishop in Troyes. It is at this point that the undisputed documented history of the Shroud begins, ironically with a complaint about its authenticity.

Bishop d’Arcis strenuously objected to this exhibition, and after writing to King Charles II and getting nowhere, he wrote the now-famous *d’Arcis Memorandum* to Pope Clement VII. In his memorandum Bishop d’Arcis referred to the Archbishop Henri de Poitiers, who had supposedly concluded that the Shroud was a forgery some “thirty-four years or thereabouts” previously (i.e., about 1355) and had supposedly conducted an inquest into the Shroud at that time. Here is the text of the relevant portions of the memorandum:

The case, Holy Father, stands thus. Some time since in this diocese of Troyes the Dean of a certain collegiate church, to wit, that of Lirey, falsely and deceitfully, being consumed with the passion of avarice, and not from any motive of devotion but only of gain, procured for his church a certain cloth cunningly painted, upon which by a clever sleight of hand was depicted the twofold image of one man, that is to say, the back and the front, he falsely declaring and pretending that this was the actual shroud in which our Savior Jesus Christ was enfolded in the tomb, and upon which the whole likeness of the Savior had remained thus impressed with the wounds which he bore . . .

The Lord Henry of Poitiers, of pious memory, then Bishop of Troyes, becoming aware of this, and urged by many prudent persons to take action, as indeed was his duty in the exercise of his ordinary jurisdiction, set himself earnestly to work to fathom the truth of this matter. For many theologians and other wise persons declared that this could not be the real shroud of our Lord having the Savior’s likeness thus imprinted upon it, since the holy Gospel made no mention of any such imprint, while, if it had been true, it was quite unlikely that the holy Evangelists would have omitted to record it, or that the fact should have remained hidden until the present time . . . Eventually, after diligent inquiry and examination, he discovered the fraud and how the said cloth had been cunningly painted, the truth being attested by the artist who had painted it, to wit, that it was a work of human skill and not miraculously wrought or bestowed. Accordingly, after taking mature counsel with wise theologians and men of the law, seeing that he neither ought nor could allow the matter to pass, he began to institute formal proceedings against the said Dean and his accomplices in order to root out this false persuasion. . . . They, seeing their wickedness discovered, hid away the said cloth so that the Ordinary could not find it, and they

kept it hidden afterwards for thirty-four years or thereabouts down to the present year. [But it was said by them that the shroud] had previously been much venerated and resorted to in that church, but on account of the war and other causes, by the command of the Ordinary, had been placed for a long time in safer keeping. . . .

Accordingly, most Holy Father, perceiving this great scandal renewed amongst the people and the delusion growing to the peril of souls, observing also that the Dean of the said church did not keep within the terms of the Cardinal's letters, obtained though they were by the suppression of the truth and the suggestion of what is false, as already explained, desiring to meet the danger as well as I could and to root out this false persuasion from the flock committed to me, after consultation with many prudent advisers, I prohibited the said Dean under pain of excommunication, by the very act sufficiently published, from exhibiting this cloth to the people until otherwise might be determined. . . . The scandal is upheld and defended, and its supporters cause it to be spread abroad among the people that I am acting through jealousy and cupidity and to obtain possession of the cloth for myself, just as similar reports were circulated before against my predecessor.

This memorandum was later used to "prove" that the Shroud was a fake because it states that an artist had confessed to painting it. Clement VII, who was Pope at the time, never ordered an investigation of the Shroud (the d'Arcis memorandum as such may never have been sent to the Pope, as it came only from the archives in Troyes). Furthermore, the artist mentioned by d'Arcis was never identified and no claim of authorship was ever made.

D'Arcis also indicated in his memorandum that the Shroud was perhaps involved in some scandal and that the church would somehow be gravely damaged ("the delusion growing to the peril of souls") if the exhibition were allowed to proceed. It is unclear how souls could be in peril through simply viewing the Shroud, and therefore the scandal may possibly have been related to the Knights Templar, who had been put on trial eighty years previously. One of the charges in their trials was that Templar members had worshiped the devil as well as an idol named "baphomet," and d'Arcis may thus have been associating the Shroud with the Templar trials and hinting that it was the source of the baphomet image.

However, d'Arcis' testimony is suspect from several perspectives. First, he was apparently resentful because

Jeanne or Geoffrey II her son had gone over his head in seeking approval from the papal legate, and the priests of the Lirey church had apparently not gotten his approval before putting the Shroud on display. Second, d'Arcis may well have wanted the revenue coming to his cathedral in Troyes instead (Lirey is a small town located approximately 20 miles from Troyes). It is also known that the nave of the Troyes Cathedral collapsed in late 1389 at the same time that the memorandum was written. This accident damaged and/or destroyed many of the relics kept there, which was one of the main sources of church fundraising. D'Arcis may therefore have been seeking to recoup and raise funds for reconstruction by forcing the de Charnys to bring the Shroud to his cathedral, or by paying him a portion of the proceeds to keep him quiet. People at the time apparently believed the same thing, as in his memorandum d'Arcis himself alludes to those who were questioning his motives ("it is spread abroad . . . that I am acting . . . to obtain possession of the cloth for myself"). Furthermore, there are royal records that the bailiff of Troyes was sent to Lirey to seize the Shroud and bring it to Troyes several months before d'Arcis wrote his letter to the pope, indicating that the bishop may have previously tried to use secular authority to take the Shroud for his own purposes.

Even more significant is the only known correspondence from Archbishop Henri de Poitiers, the churchman who supposedly held an inquest on the Shroud in 1355, to Geoffrey de Charny, the text of which is below. This letter makes no mention of the Shroud or any concerns about its being displayed (however, the reference to a "divine cult" is a probable indication that Henri was aware that the Shroud was being shown), and instead it is a letter of congratulations and appreciation to de Charny. D'Arcis' reference to a Shroud inquest by Henri de Poitiers is therefore cast into doubt.

Henri, by the grace of God and of the Apostolic See, confirmed bishop elect of Troyes, to all those who will see this letter, eternal salvation in the Lord. You will learn what we ourselves learned on seeing and hearing the letters of the noble knight Geoffrey de Charny, Lord of Savoisy and of Lirey, to which and for which our present letters are enclosed, after scrupulous examination of these letters and more especially of the said knight's sentiments of devotion, which he has hitherto manifested for the divine cult and which he manifests ever more daily. And ourselves wishing to develop as much as possible a cult of this nature, we praise, ratify and approve the said letters in all their parts—a cult which is declared and reported to have been canonically and ritually pre-

scribed, as we have been informed by legitimate documents. To all these, we give our assent, our authority and our decision, by faith of which we esteem it our duty to affix our seal to this present letter in perpetual memory. Given in our palace of Aix of our diocese in the year of Our Lord 1356, Saturday, the 28th of the month of May.

Alternatively, d’Arcis may have honestly believed the Shroud to be a painting and therefore a fake, as others erroneously believe even today, although it is unclear whether he had personally examined it. There have been many painted copies of the Shroud made throughout history, and d’Arcis may have mistakenly thought the relic at Lirey was one of them. For example, a copy of the Shroud was painted for the Besançon cathedral (Figure 23) and displayed in place of the original after the fire of 1349, and it may be to this or to another painted Shroud copy to which d’Arcis’ memo actually refers. The artist of the “Besançon Shroud” is unknown but he may have been known to Bishop d’Arcis and been the artist to whom d’Arcis referred. This painted version of the Shroud may have been a replacement for



Figure 23. The Shroud of Besançon. It was a painted copy of the Shroud from Besançon’s rebuilt St. Stephens Cathedral, displayed ca. 1377, and became famous throughout France until it was destroyed during the French Revolution. This may have been the painted shroud to which d’Arcis actually referred (Marino, 2022). From: <https://www.academia.edu/s/6eb16ace4f>

the actual one taken by Jeanne de Vergy (Scavone, 1993, p. 213).

In any case, a series of correspondences eventually ensued between Clement VII, d’Arcis, and the de Charnys. The final result was a papal order to d’Arcis requiring him to be silent and refrain from any further attacks under pain of excommunication, and another to the de Charnys and the Lirey church allowing them to display the Shroud but with the stipulation that it could not be claimed as the true Shroud of Christ. The next year Clement reversed himself and issued a papal order granting new indulgences to those who visited the Lirey church and its relics, thereby signaling that he considered the Shroud to be genuine. Far from debunking the Shroud, the *d’Arcis Memorandum* has thus become additional evidence to establish its authenticity.

Historical Evidence of the Shroud 1400–1464

After the death of Jeanne de Vergy and her son Geoffrey II, the Shroud came into the possession of her grand-daughter, Margaret (or Marguerite) de Charny. Margaret kept secret the history of the Shroud perhaps because of all of the previous controversy, admitting only that it was “conquis par feu messier” (acquired by the late sire) Geoffroy de Charny (Crispino, 1988, p. 31). But she allowed the cloth to be publicly viewed on a number of occasions during the period 1400–1453. In 1453–1454 she sold the Shroud to Duke Louis I of Savoy and received from him the castle of Varambon and revenues of the estate of Miribel near Lyon for “valuable services” to him.

Historical Evidence of the Shroud 1464–Present

Meanwhile the Lirey churchmen, missing the revenue that had been generated by the Shroud, were attempting to get it returned to them. So in 1464 Duke Louis I of Savoy agreed to pay them an annual rent, to be drawn from the revenues of the castle of Gaillard, near Geneva, as compensation for their loss of Shroud revenues. This agreement was drawn up in Paris and is the first known document indicating that the Shroud had become the property of the Savoys. The agreement specifically notes that the Shroud had been placed in the church of Lirey by Geoffrey de Charny, Lord of Savoisy and Lirey, and that it had then been transferred to Duke Louis I by Margaret de Charny. Twenty years later a history of the Savoy family recorded that Louis’ acquisition of the Shroud was his greatest achievement. Later generations of the Savoys periodically displayed the Shroud, built churches to house it, and often took the Shroud with them when they traveled. It was shown in public many times in various places, and was finally moved

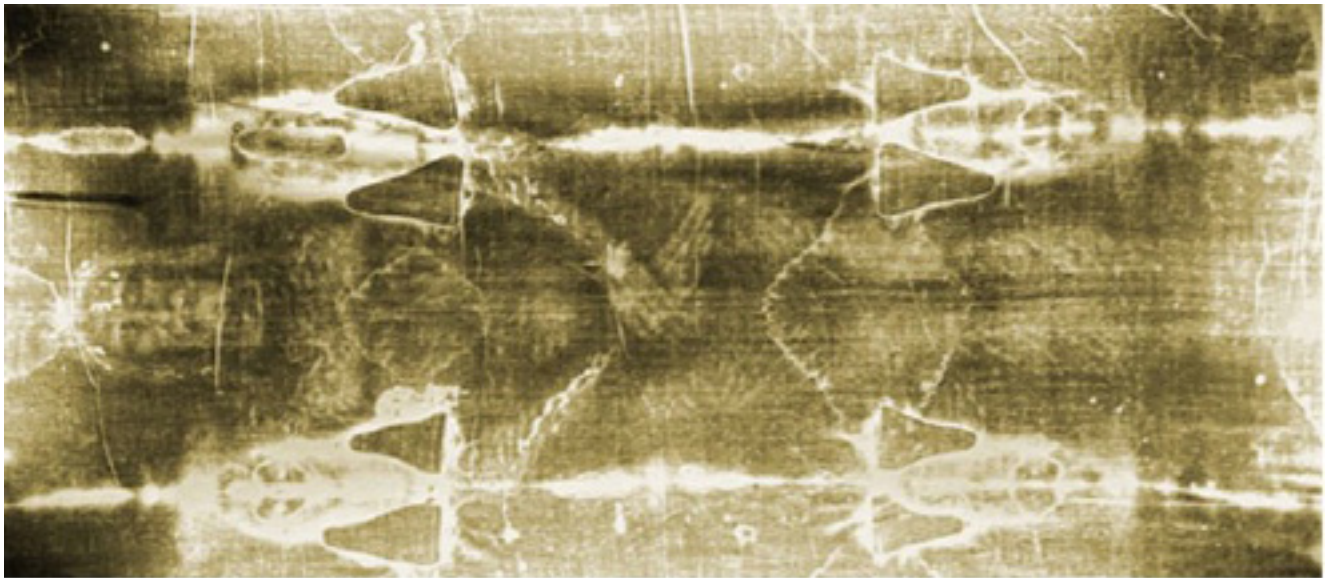


Figure 24. The Shroud of Turin. From: www.shroud.com

to Turin, Italy, in 1578. In 1694 the Shroud was placed in the Guarini Chapel in Turin where it remains to this day (Markwardt, 1998).

In 1983 Umberto II, the ex-king of Italy and legal owner of the Shroud, died. In his will he bequeathed it to the Pope and his successors, with the stipulation that the relic must remain in Turin.

The Catholic Church provided for public viewing of the Shroud at twenty-five-year intervals although the policy later changed. In 2010 the author viewed the Shroud of Turin, and the current policy is that it will be publicly viewable at ten-year intervals.

The Shroud of Turin

The Shroud of Turin (Figure 24) is a piece of ancient linen, approximately fourteen feet long and four feet wide, imprinted with an image of a naked, tortured, and crucified man (Bucklin, 1997). It contains both dorsal and ventral images; in other words, the man was placed on one end of the cloth, and it was folded over the top, and therefore there are images of both his front and back sides. There are blood stains on his scalp, feet, wrists, and right side, and lacerations over the entire body, particularly on his back (Schwartz, 2000).

Scientific scrutiny of the Shroud image began in 1900 at the Sorbonne. Under the direction of Yves Delage, professor of comparative anatomy, a study was undertaken of the physiology and pathology of the apparent body imprint and of the possible manner of its formation. The image was

found to be anatomically flawless down to minor details: the characteristic features of rigor mortis, wounds, and blood flows provided conclusive evidence to the anatomists that the image was formed by direct or indirect contact with a corpse . . . On this point all medical opinion since the time of Delage has been unanimous.

Of greatest interest and importance are the wounds. As with the general anatomy of the image, the wounds, blood flows, and the stains themselves appear to forensic pathologists flawless and unfakeable. Each of the different wounds acted in a characteristic fashion. Each bled in a manner which corresponded to the nature of the injury. The blood followed gravity in every instance (Bucklin 1961:5). The bloodstains are perfect, bordered pictures of blood clots, with a concentration of red corpuscles around the edge of the clot and a tiny area of serum inside. Also discernible are a number of facial wounds, listed by Willis (cited in Wilson 1978:23) as swelling of both eyebrows, torn right eyelid, large swelling below right eye, swollen nose, bruise on right cheek, swelling in left cheek and left side of chin.

The body is peppered with marks of a severe flogging estimated at between 60 and 120 lashes of a whip with two or three studs at the thong end. Each contusion is about 3.7 cm long, and these are found on both sides of the body from the shoulders to the calves, with only the arms spared. Superimposed on the marks of flogging on the right

shoulder and left scapular region are two broad excoriated areas, generally considered to have resulted from friction or pressure from a flat surface, as from carrying the crossbar or writhing on the cross. There are also contusions on both knees and cuts on the left kneecap, as from repeated falls.

The wounds of the crucifixion itself are seen in the blood flows from the wrists and feet. One of the most interesting features of the Shroud is that the nail wounds are in the wrists, not in the palm as traditionally depicted in art. Experimenting with cadavers and amputated arms, Barbet (1953, 102–120) demonstrated that nailing at the point indicated on the Shroud image, the so-called space of Destot between the bones of the wrist, allowed the body weight to be supported, whereas the palm would tear away from the nail under a fraction of the body weight. Sava (1957, p. 440) holds that the wrist bones and tendons would be severely damaged by nailing and that the Shroud figure was nailed through the wrist end of the forearm, but most medical opinion concurs in siting the nailing at the wrist. Barbet also observed that the median nerve was invariably injured by the nail, causing the thumb to retract into the palm. Neither thumb is visible on the Shroud, their position in the palm presumably being retained by rigor mortis.

Between the fifth and sixth ribs on the right side is an oval puncture about 4.4 x 1.1 cm. Blood has flowed down from this wound and also onto the lower back, indicating a second outflow when the body was moved to a horizontal position. All authorities agree that this wound was inflicted after death, judging from the small quantity of blood issued, the separation of clot and serum, the lack of swelling, and the deeper color and more viscous consistency of the blood. Stains of a body fluid are intermingled with the blood, and numerous theories have been offered as to its origin: pericardial fluid (Judica, Barbet), fluid from the pleural sac (Moedder), or serous fluid from settled blood in the pleural cavity (Saval, Bucklin).

So convincing was the realism of these wounds and their association with the biblical accounts that Delage, an agnostic, declared them “a bundle of imposing probabilities” and concluded that the Shroud figure was indeed Christ. His assistant, Vignon (1937), declared the Shroud’s identification

to be “as sure as a photograph or set of fingerprints.” (Meacham, 1983)

As indicated above, there is another very old piece of bloodstained cloth which is alleged to have been the cloth used to cover the face of Christ after his crucifixion. It is known as the “Sudarium of Oviedo,” was brought to Spain in the 7th century, and has been kept in the Spanish town of Oviedo since the 8th century. The Sudarium was studied in 1999, and the team studying it concluded that the Sudarium and the Shroud both covered the same injured head (Guscin, 1997). The Sudarium may have been the “napkin” or the cloth covering Christ’s head/face that was mentioned in the Gospel of John account, in John 20:3-7.

Problems with the Authenticity of the Shroud of Turin

The Shroud of Turin is purported to be the literal burial shroud of Jesus Christ. Its authenticity has thus aroused intense debate and sometimes hostile rhetoric between those who believe that the Shroud is authentic—or at least believe that it is the actual burial shroud of a crucified man who may or may not have been Jesus—and those who do not. Many attempts have been made by skeptics to challenge its authenticity on various grounds, as well as to develop alternative theories to explain how the images on the Shroud could have been faked or generated by a variety of mechanisms. For example, some have alleged that the Shroud is a painting by Leonardo DaVinci or another artist (Piczek, 1996; <http://www.unholygrail.net/blog/index.php/the-true-holy-grail/-To-34>). But despite periodic claims, no theory capable of explaining all of the characteristics of the Shroud image has yet been developed that can satisfactorily explain how the image could have been a forgery. The Shroud of Turin is therefore the most highly studied relic in the history of the world.

Considering the shady history of religious artifacts and the many fraudulent attempts to make money at the expense of credulous and naïve worshipers, it is therefore very appropriate that the Shroud of Turin be approached with an attitude of skepticism. François de Mely claimed in 1902 that there were forty-two medieval shrouds of Christ, and he even named the towns whose inventories mentioned them. But these were either simply pieces of cloth or artistic copies of the Shroud of Turin, and a number of these copies still exist (Scavone, 1999).²⁵ Nevertheless, the evidence for the authenticity of the Shroud is so comprehensive and compelling that if it were an object with no religious overtones, there would be little serious doubt as to its authenticity. But being the purported burial cloth of Jesus Christ and a possible witness to his resurrection, hence to Christ’s deity and the truth of Christianity, the Shroud

raises powerful passions in both those who believe and those who disbelieve. Accepting and especially rejecting the authenticity of the Shroud is therefore often an issue of faith and religious, or anti-religious, conviction. However, those who seriously seek to study the Shroud must approach it with an open mind and lay aside their religious persuasions as they examine the evidence. There are still questions for which no answer has yet been provided, as follows:

1. There is a lack of documentary evidence for the Shroud's existence in Biblical times. The first record of the Shroud's existence was in Edessa possibly around AD 38 as described above, but the evidence is not definitive.

2. The Shroud is one long piece of cloth, which is at variance with the burial cloths typically used by 1st century Jews, and possibly in disagreement with some of the details in the Biblical accounts of Christ's crucifixion and resurrection. However, this could also be viewed as evidence for the Shroud's authenticity, as a forger would presumably have tried to make his work fit with the Biblical accounts and with known burial customs. Also, the burial was hurried as it was near sundown on Passover; the body was transported to the tomb and the burial performed by only two individuals—Joseph of Arimathea and Nicodemus. The cloth was also supplied in haste by Joseph of Arimathea, and he may have had only one long piece of linen available to wrap the body.

3. The Bible indicates that Jesus' body was buried with myrrh and aloes, but neither of these substances could be detected on the Shroud, although at least one eyewitness historical account from around AD 1000 indicated that the cloth "smelled of myrrh." However, as indicated above, the burial of Christ was hurried, so the use of burial spices may have been minimized. It has also been alleged that the Shroud has at various times been washed and/or dipped in oil or other substances, which could have removed any myrrh or aloe residues.

4. Objections have been raised regarding the height of the man—between 5'11" and 6'1"—as most men of the time were shorter.

5. Concern has been expressed about formation of the image with regard to the way that the body was wrapped in the cloth, for example the lack of creases in various parts of the Shroud image (however, the lack of creases may also be due to the haste in which the burial was performed). Also, there is no image on the sides of the cloth where it was presumably wrapped around the shoulders, arms, and legs of the dead body. This would seem to negate the possibility of the image being formed by some type of radiation from the corpse that possibly occurred during Christ's resurrection. Assuming that radiation was responsible for producing the image, it would presumably have been emitted in all direc-

tions, unless the radiation for some reason was only emitted only in a vertical direction (see below).

6. Some have discovered what they allege to be writing on the Shroud, as well as images of coins that were supposedly placed over the eyes. They are discussed in articles such as one by Mark Guscin (Guscin, 1999). But these are typically discounted as visual artifacts and as evidence of "believer bias" by others. So this potential support for the Shroud is not very valid (Jones, 2013; Jordan, 2013).

7. Muslims deny that Jesus was the Son of God and therefore deny the validity of the Shroud on the basis of their belief (Shah, 2011).

8. Many have wondered how a piece of linen could have survived intact through so many centuries, and still bearing a visible image. However, these are arguments from silence and are not substantive enough to cause serious doubts about the Shroud's veracity. As one Shroud researcher indicated,

It has been my contention that, while the lack of historical documentation is a difficulty, the evidence from the medical studies must be treated as empirical data of a higher order. The dead body always represents a cold, hard fact, regardless of a lack of witnesses or a freely offered confession of murder. With anatomists and forensic pathologists of the highest caliber in Europe and America (many of whom are also well versed in the history of art) of one mind for 80 years about the image as a body imprint, one is on firm ground in characterizing the Shroud as the real shroud of a real corpse. The direct testing of the last 20 years goes farther in demonstrating that the relic is a genuine grave cloth from antiquity rather than the result of a medieval forger's attempt to imprint the cloth with a smeared corpse. Fleming (the medieval textile expert who examined the Shroud) concurs, with the conclusion that 'it is the medical evidence that we are certainly looking at a gruesome document of crucifixion which satisfies me that the Shroud is not medieval in origin'. (Meacham, 1983)

9. One of the long-standing beliefs of skeptics was that the Shroud was a painting done by a medieval artist. The strongest contemporary proponent of this hypothesis was Dr. Walter McCrone, now deceased, who was a consultant to the original Shroud investigatory team (known as STURP, "Shroud of Turin Research Project") in 1978. However, his painting hypothesis was not based on examination of the Shroud itself, as he never saw it, but only on his analysis of sticky tapes, which were used to take samples

of surface materials from the cloth and then sent to him for analysis. McCrone had previously been instrumental in debunking the “Vinland Map” which was supposedly the earliest depiction of the New World, showing a section of North America’s coastline southwest of Greenland (Cummings, 2021). Archeological discoveries at L’Anse aux Meadows in Newfoundland during the 1960s have since confirmed that the Vikings had built settlements in the Americas long before Columbus sailed, but the Vinland Map was a forgery proved by the analysis from McCrone’s laboratory. After that success he apparently wanted to enhance his reputation by debunking the greatest relic of all time, so he broke an agreement that the team had made to delay publishing individual results until a team report had been produced. McCrone published first in order to discredit the Shroud, alleging that it was a painting done by a medieval artist. But it is his conclusions that have been discredited by a wealth of subsequent investigation.

Much publicity has been generated by the assertions of McCrone (1980), a former STURP consultant, that the image is a painting, judging from the microscopic identification of traces of iron oxide and a protein (i.e., possible pigment and binder) in image areas. The STURP analysis of the Shroud’s surface yielded much particulate matter of possible artists’ pigments such as alizarin, charcoal, and ultramarine, as well as iron, calcium, strontium (possibly from the soaking process for early linen), tiny bits of wire, insect remains, wax droplets, a thread of lady’s panty hose, etc. (Wilson 1981). However, this matter was distributed randomly or inconsistently over the cloth and had no relationship to the image, which was found to be substanceless, according to the combined results of photomicroscopy, X-radiography, electron microscopy, chemical analyses, and mass spectrometry. McCrone’s claims have been convincingly refuted in several STURP technical reports (Pellicori & Evans, 1980, p. 42; Pellicori, 1980, p. 1918; Heller & Adler, 1981, pp. 91–94; Schwalbe & Rogers, 1982, pp. 11–24). The results of previous work by the Italian commission also run totally counter to those claims (Filogamo & Zina, 1976, pp. 35–37; Brandone & Borroni, 1978, pp. 205–214; Frei, 1982, p. 5). Undaunted, McCrone continues to stake his reputation on the interpretation of the Shroud image as a painting. (Cummings, 2021)

McCrone’s conclusions are largely based on his examination of material obtained from the Shroud on Mylar sticky tapes by the STURP group in 1978. There are, indeed,

linen fibers with paint pigments on them on these tapes, but it has apparently eluded McCrone that these are fibers which translocated to the Shroud from the some fifty-five medieval painted “true copies” which were laid by the artist directly on top of the Shroud as a “brandum.” These pigmented fibers have nothing to do with the images on the Shroud other than their proximity to some of the body images, which one would expect considering their origin (Whanger, 1998).

Walter McCrone continued to defend his painting hypothesis (McCrone, 1999) despite the overwhelming evidence against it, because admitting the fact that he had been wrong would have destroyed his reputation and possibly put his lab out of business.

10. Carbon dating tests were done on the Shroud in 1988, and the results indicated a date in the Middle Ages, from 1269 to 1390, which is the main reason why many think that the Shroud is not genuine. When the dating results were published, secularists breathed a sigh of relief, and concluded that the Shroud was a fake and could be safely ignored. But if anyone doubts that there is dishonesty and politics in science, the C14 dating of the Shroud should disabuse them. The procedures were questioned even before the results were announced, and from beginning to end the process was filled with deception, political maneuvering, arrogance, inflated egos, and mistakes. Joseph Marino, a prolific Shroud researcher, compiled a thorough assessment in his book, *The 1988 C-14 Dating of the Shroud of Turin: A Stunning Expose*, in which he documents what took place (Marino, 2020).

— Willard F. Libby who invented the carbon dating process in 1947, indicated that he felt the Shroud was not a good candidate for C14 testing because of its long history of being handled and damaged by fire (Marino, 2020, p. 2). Radioactive dating is presumed by the public to return hard and accurate dates but has been repeatedly shown to be wildly inaccurate at times. For example, the Greek archaeologist Spyros Iakovidis stated: “I sent a certain amount of the same grain sample to two different laboratories in two different parts of the world . . . The readings differed by 2,000 years... I feel that this method is not to be trusted” (Marino, 2020, p. 698).

— In 1973, five years prior to the STURP investigation, a sample was taken from a corner of the Shroud (known as the “Raes” sample) and several people including Walter McCrone wanted to have C14 dating done on that sample despite research that already concluded the edges of the Shroud had been rewoven in that area. Dr. Harry Gove, a leader in the latest dating technology and who desperately sought to have his lab involved, was quoted as saying “I sometimes think that McCrone dreamed of becoming history’s greatest iconoclast” (Marino, 2020, p. 5). He also

wrote, “I was determined to prevent their [the STURP team’s] involvement in carbon dating the shroud, if that were ever to come about.” The man remained hostile to the team who had done the most intensive scientific investigation of the cloth in history (Marino, 2020, p. 8).

— In 1985–1986 a group of about twenty experts in various aspects of carbon dating held a series of meetings for the sole purpose of setting up a protocol for carbon dating the Shroud, knowing that this would be the most complicated and controversial carbon dating ever done. Among the group’s recommendations were the taking of seven samples from seven different places, the use of seven laboratories and two techniques, the careful analysis of the samples to determine their characteristics and contents before the carbon dating itself, the use of careful controls, and the collating and tabulation of the test results before releasing the information to the public to eliminate as many potential doubts as possible. All of their recommendations were ignored.

— For reasons that remain very unclear but are suspicious to many of us, shortly before the taking of the sample in 1988, the protocol was completely discarded by the then scientific adviser to the then Cardinal, the Archbishop of Turin, who is custodian of the Shroud. The adviser allowed only one sample to be taken, he (instead of the recommended textile expert) determined where the sample would be removed, he used only three of the laboratories and only one of the test methods. Many objected to this violation of the protocol but were told basically to get lost if they didn’t like it.

When we heard where the single specimen was taken from, we were appalled, as he chose the worst possible site on the Shroud, even though he had been advised to stay away from such areas. The specimen was taken from the lower edge of the Shroud on the side that has the seam running its full length (the anterior aspect), next to the missing corner. This is visibly the dirtiest area on the Shroud (having been handled by this corner on numerous occasions over the centuries), and it is also at the edge of burn marks and a water stain from 1532. The sample taken included the seam which was added at an unknown date probably to help reinforce the Shroud fabric. The seam and some extraneous fibers were trimmed from the specimen. Contrary to the common idea that three different specimens were tested, three pieces were cut from the one specimen, one piece being given to each of the three laboratories so that the single specimen was tested three times, and only by a single technique (AMS). (Whanger, 1998)

— Through a complicated series of political wranglings and machinations between Vatican officials, Gove, and other parties, all members of the 1978 STURP research team were eliminated from involvement, including Dr. Robert Dinegar who had been originally selected to lead the effort (Marino, 2020, p. xvi). Marino elaborates, “Given that an enormous amount of publicity, grants, other financial considerations (e.g., Oxford eventually was given a one-million-pound donation to establish a chair) and a perceived battle between science and religion were involved, the Shroud dating was a prime candidate for passion ruling an experiment” (Marino, 2020, pp. 408-409).

Gove complained that the STURP team were all “religious zealots” although it also seems that a number of “anti-religious zealots” were also involved including Gove himself. Another example was David Sox, a cheerleader for Gove and a passionate Shroud denier, despite or perhaps because of the fact that he was an Episcopal priest. He wrote his Shroud book *The Shroud Unmasked—Uncovering the Greatest Forgery of All Time* even before the dating results were released (Marino, 2020, p. 454).

There were a number of irregularities in the handling of the samples and in the people involved, even with regard to the modified protocol. William Meacham, an archaeologist on the team, subsequently wrote a book, *The Rape of the Turin Shroud: How Christianity’s Most Precious Relic was Wrongly Condemned and Violated* (Marino, 2020, pp. 33–36).

— After the testing was done in October 1988, an article alleging that the Shroud was a medieval fake was published in *Nature* even before the data was available (Marino, 2020, p. 478). The raw data from the labs was not released until 2018, thirty years after the testing, and required a Freedom of Information Act request to obtain it from the British museum (Marino, 2020, p. 708). After the British Museum was forced to release the raw data it became obvious why the Museum had stonewalled prior requests—all of the anomalies of the results were then revealed. One of the labs involved belatedly admitted (thirty years after performing the testing) that the original conclusions should have been disqualified: “A statistical analysis of the *Nature* article and the raw data strongly suggests that homogeneity is lacking in the data, and that the procedure should be reconsidered” (Casabianca et al., 2019). Thomas de Wesselow, an expert on medieval art, provided the following summary: “The carbon dating of the Shroud will probably go down in history as one of the greatest fiascoes in the history of science. It would make an excellent case study for any sociologist interested in exploring the ways in which science is affected by professional bias, prejudices, and ambitions, not to mention religious and irreligious beliefs” (De Wesselow, 2012, pp. 160–172). The process did

become the subject of a doctoral thesis: *The Socio-Politic of a Relic: Carbon Dating of the Turin Shroud* (Laverdiere, 1989).

— A definitive answer to the dating controversy and its coup de grace came from a study released on 20 January 2005, in which Raymond Rogers, a scientist from the Los Alamos National Laboratory and one of the original members of STURP, conclusively demonstrated that the sample used for the carbon dating tests was taken from a rewoven area of the Shroud, and therefore did not represent the original fabric (Rogers, 2005).

The 1988 Shroud carbon dating tests and results have thus been discredited.

Evidence for the Authenticity of the Shroud of Turin

Even admitting any questions of carbon dating, the amazing image on the Shroud must still be explained. In the words of Shroud researcher John Walsh, “The Shroud of Turin is either the most awesome and instructive relic of Jesus Christ in existence . . . or it is one of the most ingenious, most unbelievably clever products of the human mind and hand on record. It is one or the other; there is no middle ground” (Meacham, 1983). Following are characteristics of the Shroud, which argue for its authenticity:

1. The first recorded showing of the Shroud was in 1353–1357, and it was publicly displayed many times after that, so if it were a forgery, it must have been done prior to that period with the technology available in that era. Leonardo DaVinci, who has sometimes alleged to have been the artist, was born in 1452 (Piczek, 1996). The carbon dating procedures performed on the Shroud which dated it to the period 1269–1390 have been discredited as described above.

2. The picture on the Shroud is actually a negative image and must be photographically inverted to see the positive image. Concepts of negative images were certainly known in the past; for example, the mold that is used to cast a statue is a “negative image.” But no true negative images were seen until the invention of photography around 1826. In fact, this aspect of the Shroud was only noticed when the Shroud was first photographed in 1898 (Piczek, 1997). Therefore, how could a medieval artist have even conceived of a negative image or have been able to render it?

3. The Shroud is linen, and raw unprepared linen repels water and is difficult to paint. Furthermore, there is no artistic “style” to the image, no pigments and no brushstrokes. It is “photographic” in nature rather than “artistic” (Piczek, 1997; <http://www.unholygrail.net/blog/index.php/the-true-holy-grail/-To-44>). Furthermore, the image lacks the sharp outline and color of a painting, as it is a

fairly uniform sepia-yellow in color. The “lines” making up the image are approximately 1/100 the width of a human hair, making it impossible for the image to be painted by an artist. As indicated above, only one contemporary researcher has claimed that the image was produced by paint (Dr. Walter McCrone), but others have demonstrated conclusively that the actual Shroud image is not created from pigment (Piczek, 1995; <http://www.unholygrail.net/blog/index.php/the-true-holy-grail/-To-46>). The Shroud was apparently used as a template for medieval painters, and thus there are traces of pigment and iron oxide on the surface, as described in the quote above. Microscopic examination found no evidence of capillarity action (i.e., soaking up of a liquid) in the fibers. This indicates that the image was not caused by the application of a liquid such as an acid, or by an organic or inorganic chemical in liquid form. This would include paint, dye, or stain.

4. The Shroud figure is naked, which would have been repugnant and unacceptable for a medieval artist in depicting Christ.

5. The plethora of artistic depictions of Jesus from the 1st through the 16th centuries showed him as being nailed to the cross through the hands, whereas in the Shroud image he is nailed through the wrists. As indicated above, nailing through the hands would not have supported a man’s weight, and the purported artist would have had to have known this fact and gone against all artistic precedent.

6. Unlike paintings, the Shroud image has three-dimensional holographic-type qualities encoded within it, as

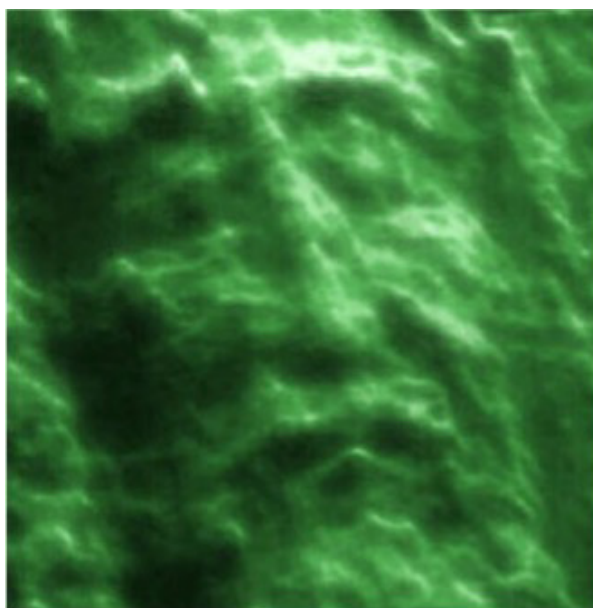


Figure 25. A 3D rendering of the face of the man on the Shroud. (Photo from Joy of the Lord, www.pinterest.com)

the strength of the image is proportional to the distance from the associated body part. For example, the nose area is shown very strongly, but the eyes less so (Schumacher, 1999). Therefore, a three-dimensional “map” can be created showing the face and other parts of the body in bas-relief, as shown in Figure 25.

7. The man’s head and knees are slightly bent, and therefore the image has foreshortening in it. The concept of foreshortening was first discovered and used by the Renaissance painters sometime after the Shroud was first shown (Piczek, 1995).

8. The three-dimensional aspect of the image also explains why it cannot be a block print. Complex carved wood block printing had been done for some time, but only on a flat sheet of paper or canvas. A three-dimensional block print would distort the image as well as producing smears (Piczek, 1995).

9. The Shroud images can be seen in front lighting but cannot be seen if lit from behind. This indicates they were not generated by the application of any substance to the front surface of the cloth, meaning that the image could not be a rubbing, a dusting, or a print.

10. The image coloration makes it appear to be a scorch (i.e., due to contact of a hot object with cloth). However, this type of scorch will fluoresce under ultraviolet light, but the Shroud image does not fluoresce, indicating that it was not produced by scorching. A scorching process would also have discolored the linen fibers of the Shroud all the way through, rather than only on the fiber surface, as the image is only on the interior surfaces of the cloth.

11. The “light source” seems to come from within or behind the image rather than from an external point, as would be the case with photographs, which are created by light reflected from the surface of an object. The edges of the image seem to “melt away” and are not sharp as they would be in the case of an actual photograph. In addition, there are no shadows in the image as would occur in a photograph, nor have any silver or silver-related (i.e., light-sensitive) compounds been detected on the Shroud (Schwartz, 2000).

12. The medical opinion on the Shroud since it was first seriously examined in 1900 has been unanimous—that the image was produced from a real man who had been tortured and died in the same manner as did Jesus in the Gospel accounts. Given the contusions, whip marks, blood flow, etc., the general medical conclusion is that the image is unfakeable.

13. A number of researchers have demonstrated the presence of blood on the Shroud and some have done testing on the DNA in the blood. The blood was shown to be from a human male who had experienced extreme trauma (Ford, 2000). Dr. McCrone claimed that there is no blood

on the Shroud, but he never examined it, and he was the same individual who fallaciously claimed that the image was painted. There have been a few attempts to discredit the blood stains, but they have been dismissed (Borrini, 2019, pp. 137–143).

14. The Shroud contains pollen and plant images from plants that grow in the Jerusalem area (Dannin, 1998).

15. A recently advanced hypothesis is that the Shroud is a medieval photograph done by Leonardo DaVinci and taken with a *camera obscura* using actual cadavers (Allen). According to this hypothesis, the Lirey Shroud of the 1350s was a painted and counterfeit relic; after the Savoy family acquired it in 1464 they supposedly discovered that they had purchased a fake and then commissioned Leonardo DaVinci to create what would presumably be a more realistic fake by using the photographic method stated above. This effort, which has no historical support whatsoever, supposedly produced the Shroud we have today. However, the optical characteristics of the Shroud as stated in the paragraph above on photography, as well as other physical and historic factors, makes this hypothesis untenable (Sorensen, 2005).

16. Another image-formation method proposed was the exposure in sunlight of a piece of cloth soaked in bleach placed under a large piece of glass, over which a painted version of the Shroud is laid. This method supposedly produces an image similar to the Shroud, but has at least two fatal flaws: 1) it requires a large flat piece of glass, at least 6’ x 3’, which did not exist in the Middle Ages; and 2) the chemistry of the Shroud image is completely different than one that would be produced by such a method, because it has been demonstrated that in the real Shroud the image is deposited only on the surface of the fibers (Rogers & Arnoldi). The depth of the image is therefore very thin (Adler, 1999).

17. Some years ago the Shroud was cleaned, and the backing material was removed. Another faint facial image was then discovered on the back side of the cloth matching the main facial image, making it virtually impossible for the Shroud to be a fake (<http://www.unholygrail.net/blog/index.php/the-true-holy-grail/-To-57>). This was not previously detected because of the backing material that had been sewn on the Shroud at some point during the Middle Ages.

18. Scientists have recently developed a new method of dating ancient textiles using a technology known as WAXS (Wide-Angle X-ray Scattering) which operates by detecting the degree of structural degradation of threads from a cloth. In contrast to carbon dating, this method is non-destructive and can be done on very small samples (0.5 mm). A number of cloth samples have been dated with this technology, and when one of the threads from the “Raes” sample of the Shroud was analyzed, the date

returned was similar to that of a linen fragment from the Siege of Masada, which took place in 55–74 AD. This analysis thus places the Shroud in the era of Christ's death and resurrection, ca. 30 AD (De Caro et al., 2022).

19. Despite many attempts, no theory of image formation has as yet been advanced that successfully explains how the Shroud could have been a forgery (Sorensen, 2007b). It is questionable that even with today's technology a body imprint could be generated with all of the characteristics of the Shroud of Turin.

There are many shroud-related internet resources, but a good starting place for anyone looking for detailed historical and scientific information is the Shroud of Turin website (Schwartz, 2000) maintained by Barrie Schwartz who was the videographer for the 1978 STURP team.

The question remains, how was the image generated? Ray Rogers, one of the STURP team members, believed that it was created by a chemical reaction between the cloth and the body fluids, and/or vapors from the corpse (Rogers & Arnoldi, 2003). However, there is no evidence that any human body has ever encoded high resolution images of itself onto the surface of any clothing in all of human history (aside from the Shroud), and our current understanding of the laws of science does not include any mechanism for this to happen. Therefore Roger's answer is unacceptable for the generation of the Shroud image.

Robert Rucker, in his article *The Role of Radiation in Image Formation on the Shroud of Turin* (Rucker, 2020), notes that the images on the Shroud are a unique phenomenon, and there has been a complete failure to propose any naturalistic method by which the images could have been created. Scientists may therefore be barking up the wrong tree, and instead need to think outside their naturalistic boxes. Rucker makes the following points:

— The image is a uniform sepia color, and a mechanism was necessary to discolor only the top portion of the linen fibers, as the thickness of the image is only 0.4 microns deep, less than a wavelength of light. In other words, only the outer surface of the fiber was discolored—the inside was unaltered as indicated above. Furthermore, the discoloration was not due to pigment but rather to a change from single to double electron bonds of some of the carbon atoms on the surface molecules. The Shroud has survived several fires, but the high temperatures did not cause any change in the image as would be the case if the image was chemically generated.

— The mechanism for this was probably a static discharge (a "lightening rod" effect) due to radiation emitted by the body within the Shroud which probably occurred during the resurrection event. Researchers have indicated that the image shows bones close to the surface (teeth, vertebrae, and hand and skull bones). Therefore, radiation

from within the body would be the only way that such an image could be created.

— It is known that bursts of protons and high energy infrared and ultraviolet light can create discolorations in cloth. However, such radiation is typically emitted in all directions, which should seemingly have caused images on the sides of the cloth as well. The Shroud images are only vertical, as there is no image from the sides of the corpse. The body of Christ was said to disappear or "collapse" during the resurrection which was likely the cause of the radiation penetrating the Shroud. If the radiation occurred at the end of the collapsing process, the cloth would also have collapsed, resulting in only vertical images that seem to "melt away" at the edges.

— Radiation from the body within the Shroud traveled only a short distance and affected only the top molecular layers of the cloth. Body parts that were not in contact with the cloth, such as the eyes, show little detail, so air gaps served as a blocking mechanism. Also, no image exists under the places where blood appears on the Shroud, so the presence of blood absorbed the radiation that otherwise could have produced an image.

— Rucker suggested that if a burst of neutrons occurred, this could also have potentially increased the C14 content of the Shroud (i.e., by creating more radioactive carbon atoms) resulting in a later date being returned by the dating process (Rucker, 2018).

— Quantum physicists currently espouse "string theory" as the best method of explaining sub-atomic phenomena. In this theory, everything including all matter and energy (protons, neutrons, photons, quarks, etc.) are composed of much smaller components known as "strings." All of the characteristics of both matter and energy (mass, charge, chemical and nuclear reactions capabilities, etc.) are caused by the nature and the possibilities of these combinations of strings, which in turn make up our physical reality. For example, the elements iron and copper are metals whereas oxygen and nitrogen are gases. In other words, everything in our physical cosmos is caused by the large variety of string combinations, which operate under a series of strict rules in generating subatomic entities such as protons and photons (i.e., it is not clear whether they are fundamentally "particles" or "waves" as they seem to have properties of both). String theory also posits that there are ten dimensions which are beyond our known dimensions of length, width, height, and time. The additional dimensions are said to be "wrapped" within a "Planck-length" distance of the known dimensions (a Planck-length, named after the quantum physicist Max Planck, is the shortest possible length of anything and is approximately 0.000,000,000,000,000,000,000,000,001 meters). If someone were to travel or transition into one of these

dimensions, perhaps like the teleporting capability shown in the *Star Trek* series, the process could have caused a release of energy which produced the Shroud images.

— The possibility that the Shroud image was generated by radiation emitted during the resurrection process should not be objected to as either unscientific or even startling. An essential axiom of science is that researchers must be open to new phenomena and new information even if it conflicts with current understanding so that our conceptions of how things work can be modified and expanded to cover everything that we observe. Therefore, it is important for us to understand how the Shroud images could possibly be formed so that we have a correct view of reality.

Western society is said to be “post-Christian” and we may have lost the numinous awe that the Shroud helped to inspire in past centuries. But it is still an object of mystery that defies our best attempts to explain it in purely naturalistic terms. As more testing on it is done and as additional ancient documents are discovered and translated, our knowledge of the Grail–Shroud connections will increase. In the meantime, science has been stumped.

Conclusion

The Holy Grail was purely a literary concept, but the Shroud of Turin seems to have been the source of its literature and the object upon which the grail stories were based. A summary of the reasons include:

1. The many-faceted concepts associated with the Grail: human sinfulness and suffering, divine forgiveness, the sacrifice necessary to pay for that forgiveness, the quest for personal meaning and redemption, the longing for something beyond this world, and the desire for God, heaven, and eternal life. As mentioned above, the word “grail” comes from the Latin *gradale* meaning “gradually, in stages,” so the origin of the word encapsulates the transitions in meaning and the complexity of the underlying ideas, culminating in the Holy Grail—the Cup of Christ containing wine representing his blood. All of these ideas are personified in the Shroud.

2. The grail stories were written after the Shroud was brought to Constantinople and kept there for a period of 260 years. Constantinople had been the capital of the Roman Empire, was the seat of the Greek Orthodox Church, and for centuries was the largest and most influential city in the world. Religion in Constantinople was extremely important, and one writer characterized religious discussion there as “the sport of the people—the football and baseball of that era” (Duffy, 1997). Thus the Shroud had a huge impact on Byzantine thought and society, made all the more significant because of the significance of Constantinople as



Figure 26. Christ at the Last Supper. Photo: <https://enterthenarrowgate.org/first-eucharist>

a major metropolis.

3. Robert de Boron wrote that Joseph of Arimathea used the Last Supper (Figure 26) cup to catch the blood of Christ on the cross, thus creating the literary heritage of the Holy Grail. But in his story *Joseph d'Armathe*, the Emperor Vespasian is healed, not by a chalice, but by a cloth containing the image and blood of Christ. This was a clear literary allusion to the Shroud and was based on the miraculous healing of Abgar V who may have been the historical Fisher-king that the story was originally based on, who was healed by the power of the blood of Christ from the Shroud. De Boron thus made the leap from the “grail” of Chrétien and transliterated it into the Holy Grail by infusing his stories with Christian communion concepts, overlaid with Shroud imagery. His stories in turn influenced the development of the King Arthur tales and the quest for the Holy Grail which are still popular almost a millennium later.

4. During the time following the Shroud’s appearance there was a new flowering of Eucharistic symbolism that the image on the Shroud could then be combined with a realism of Christ’s passion, thus creating a “new language of Christian art” (Scavone, 1996). The Shroud was in large part responsible for the development of Byzantine art and iconography, which was widely viewed, and had a significant artistic impact on society that carried over into literary works.

5. The esoteric order of the Knights Templar who in the medieval mind epitomized Grail knights and were reputed to be keepers of both the Shroud and the Holy Grail.

6. The fact that that Shroud, like the Holy Grail, contained the blood of Christ, and therefore carried the same

ethereal and immortal significance. Early church leaders had often used the Last Supper cup as an analogy for Jesus' death—the actual chalice representing the body of Christ and the wine representing his blood, giving an ethereal significance to the cup. Byzantine iconography would often picture the wounded Christ along with a chalice representing the “cup of sorrows” that Jesus “drank” on the cross. The Catholic church teaches the doctrine of *transubstantiation*, the belief that the wafer and wine administered to the communicant are a literal means of God's grace and “become the body and blood of Christ” to that person. The “container” of Christ's blood would therefore be the chalice used in the Eucharistic rites. Given these powerful religious metaphors of a literal chalice becoming a source of divine grace, it is easy to understand how a communion chalice was transformed into the Holy Grail of legend, and how the grail came to be viewed as a cup, despite the fact that the origin of the grail stories was probably the Shroud.

Given the above history and evidence, it is therefore my reasoned conclusion that the object knowingly or unknowingly alluded to as the Holy Grail throughout literary history—the object behind the myth—was actually the Shroud of Turin, the burial cloth of Christ. As is true of any historical artifact, the Shroud of Turin cannot be proven to be authentic, but unlike other religious relics, the evidence for its veracity is very strong. If it is truly authentic, the Shroud of Turin is thus the “San Greal” (the Holy chalice) and contains the “Sang Real” (the royal blood) of Christ.

The Shroud of Turin is the true Holy Grail.

NOTES

¹ The Catholic church teaches the doctrine of *transubstantiation*, the belief that the wafer and wine administered to the communicant are a literal means of God's grace and “become the body and blood of Christ” to that person.

² The symbolism doesn't end there. The Old Testament often refers to the need for a sacrifice as an atonement for evil—that the blood of an innocent unblemished animal had to be shed to atone for sin. This concept goes back to the beginning of humanity and the Biblical story of Cain and Able (Genesis 4). The Jews had an elaborate sacrificial system which prefigured and was ultimately replaced by the sacrifice of Christ who was sinless and therefore “unblemished.” His crucifixion took place on Passover—the Jewish celebration of their liberation from Egypt in which the blood of a lamb was smeared over the doorpost of their houses so that the angel of death would “pass over” them. The lamb then was roasted and eaten—Christ was the “Lamb of God who takes away the sin of the world” and at the Last Supper he said, “This is my body which is broken for you, and this cup is the new

agreement in my blood which is shed for you. Do this in remembrance of Me.”

The symbolism continues: Easter Sunday when Christ rose from the dead was also the Jewish festival of First Fruits, and the Apostle Paul uses that analogy: “But now Christ has been raised from the dead, the first fruits of those who are asleep. For since by a man came death, by a man also came the resurrection of the dead. For as in Adam all die, so also in Christ all will be made alive. But each in his own order: Christ the first fruits, after that those who are Christ's at His coming, then comes the end, when He hands over the kingdom to God” (1 Corinthians 15:20–24).

Furthermore, in the Old Testament the Ark of the Covenant was placed in the innermost part of the Temple, in a room known as the Holy of Holies. The central portion on the lid of the Ark between the golden figures of the cherubim was known as the “Mercy Seat”—the place where God would provide propitiation and mercy for the sins of the people. The exact design for the Temple was given by God to Moses and was a representation on earth of what is in heaven. The High Priest of Israel was the only person who could enter the Holy of Holies and he did so only once a year on Yom Kippur, the Day of Atonement, in order to sprinkle blood from a sacrificial animal on the Mercy Seat. When Jesus died, the veil covering the Holy of Holies was torn from top to bottom, showing that the way was open for all to come into the presence of God through the blood of Christ.

The term “Christ” is a title meaning “Messiah”, “Chosen One”, and “Ruler.” In addition to Jesus being the Passover lamb, one of his many other titles is “High Priest.” In that role he symbolically entered the Holy of Holies for us, gave his own blood that was figuratively sprinkled on the Mercy Seat as the sacrifice for everyone, and opened the way for all to enter. Before returning to heaven Jesus indicated that he would send the Spirit of God to live in us, so the Eucharist therefore symbolizes us partaking of Christ through the Spirit, which now lives within us. Furthermore, Jesus is both priest and king and therefore he has both ecclesiastical and political power. After his return he will rule as king, and his throne will be the Mercy Seat.

³ Blood is, of course, a vital fluid, so as mentioned above, the “blood of Christ” represents his life essence that was poured out as a sacrifice for humanity. Wine as a drink is also necessary for sustaining life, and its role as well as its appearance connects it with blood.

⁴ The Templars were a military monastic order that was originally devoted to protecting pilgrims on their way to Jerusalem. It can be hard for us as moderns to understand the motivations of the Templars and the pilgrims

they protected, as many of them had a deep devotion to what they felt was their calling.

⁵ Both Eleanor and Marie were proponents of courtly love in which marriage bonds were to be formed on the basis of love and desire rather than political or social expediency, and men were expected to “win” their ladies and treat them with dignity and honor.

⁶ The Angevin empire is little known today, but in its time it was one of the most significant regions in Europe. Henry II, who was the cleverest and most powerful of all of the Angevin rulers, had his own purpose for commissioning these literary works. They were funded not simply to improve public morality, but also as a subtle form of propaganda, meant to associate himself and his Norman (French) lineage with an ancient and mythic past, and so legitimize his reign in the minds and hearts of his Celtic and Anglo-Saxon subjects in England. The latter were resentful of Norman rule which was often overbearing and high-handed (Sir Walter Scott’s novel *Ivanhoe* provides insight into the tenor of those times). England was essentially the milk cow that supplied the Angevin rulers with money to carry out their plans of conquest on the continent. Henry II was the Count of Anjou in France before becoming King of England, and the Angevin dynasty, which included Richard the Lionhearted as well as Prince John of Robin Hood fame, was based in Angers, France. The Angevins were more French than they were English, and the many conflicts in this royal house were for the most part responsible for the long and destructive wars, as well as the hatred that developed between France and England.

⁷ Wagner was essentially neo-pagan and attracted to the philosophy of Arthur Schopenhauer. The latter was an atheist, enamored with Eastern religion, and he believed that the world was inherently irrational. But Wagner’s final opera *Parsifal* was a recreation of von Eschenbach’s *Parzival* as a sacred consecration play which included a celebration of the Eucharist. According to Nietzsche, Wagner knelt before the crucifix, and may have sought for the God of the Bible. Like the rest of Wagner’s work and the state of his soul, it is a mystery.

⁸ Nicodemus was a Jewish religious leader who visited Jesus at night (he was afraid of denunciation by the Jewish leadership) as recorded in John 3. He is the individual to whom Jesus indicated “You must be born again” (John 3:5), as well as the famous verse in John 3:16. Nicodemus became a believer in Christ and assisted Joseph of Arimathea in Christ’s burial (John 19:39).

⁹ Matthew 2:18 is a quote from Jeremiah 31:15—“A voice was heard in Ramah, weeping and great mourning; Rachel weeping for her children. She refused to be comforted because they were no more.” Rachael was the wife

of Jacob in the Old Testament and was on the way from Ramah to Bethlehem (they are 11 miles apart) when she died in childbirth. Matthew therefore views Rachael’s last journey as pointing to the future birth of Christ and his escape from the clutches of Herod.

¹⁰ For example, Herodotus writing in the 5th century BC, refers to the metal trade with the “Islands of the West” and the Roman historian Diordorus Siculus from the 1st century BC describes how Phoenician ships “voyaged beyond the Pillars of Hercules into the sea that men call the ocean.” However, Joseph may have instead journeyed up the river systems of France to reach Britain.

¹¹ Hugh Paulinus Cressy (1605–1674) who wrote *Church History of England*, stated, “Now the most eminent of the primitive disciples, and who contributed most to this heavenly building, was St. Joseph of Arimathea. . . . These toward the latter end of Nero’s reign and before St. Peter and St. Paul were consummated by a glorious martyrdom, are by the testimony of ancient records, said to have entered this island.” Therefore Britain, “received the beams of the Sun of Righteousness before many other countries.”

¹² The setting for the seduction of Igraine by Uther Pendragon was in Tintagel Castle on the western coast of Cornwall, in the far south and west of England.

¹³ However, some have alleged that the large increase in depression and other psychiatric disorders is largely caused by increased use of both illegal and legal drugs, especially psychotropic drugs such as xanax and valium. See, for example, <https://www.publichealth.columbia.edu/public-health-now/news/depression-rise-us-especially-among-young-teens>

¹⁴ There is a tradition that Lazarus became the bishop of Cyprus. The Church of St. Lazarus in Larnaca is dedicated to him and his supposed tomb is in the crypt of the church. However, it is not clear how Lazarus could have been an evangelist and a church leader in both Cyprus and Marseilles.

¹⁵ Wilson (1978) indicated that the central point of the grail stories was “a very special secret vision of Christ.”

¹⁶ Scavone (1996, 2010) wrote, “Specific documents and rituals surrounding the Mandyion resonate closely with and provide precise sources for the chief attributes of the Holy Grail. Like the legendary Holy Grail, this cloth was linked to Joseph of Arimathea, resided in a place known as Britium [another name for Abgar’s residence in Edessa], was thought to have contained Jesus’s body, captured Jesus’s dripping blood on Golgotha, and was displayed only rarely and in a gradual series of manifestations from Christ-child to crucified Jesus.”

¹⁷ There is an Assyrian tradition that the wise men who visited the infant Jesus either came from or traveled through

Edessa in fulfillment of a prophecy made by Zoroaster in the 7th century BC. On their return they supposedly told of the wonderful things they had seen and heard, preparing the Edessians for the reception of Christianity.

¹⁸ There are a number of documents that tell various aspects of the King Abgar story, such as *Ecclesiastical History* 1.13, written by Eusebius of Caesarea, the 4th century church historian.

¹⁹ “You shall not make for yourself an idol, or any likeness of what is in heaven above or on the earth beneath or in the water under the earth. You shall not worship them or serve them” (Exodus 20:4-5).

²⁰ Bernard of Clairvaux (1090–1153) was the European champion and cheerleader of the Templars. He was one of the most influential men of his time, and his Cistercian order of monks was one of the largest and best funded. However, he operated as a power behind the throne. For example, he was a “pope-maker,” heavily involved in promoting the election of Innocent II in 1130, and then selecting the following pope, Eugenius III. The latter was Bernard’s ex-disciple and was said to be a mild man of simple character and a lackey of Bernard who made the decisions and was the actual pope. Bernard was the main proponent and cheerleader for the 2nd Crusade, and when in 1150 it failed in disaster both men were blamed. Bernard tried to disassociate himself by claiming that the fiasco was caused by the sins of the crusaders, but both Bernard and the pope died shortly afterward in the same year.

²¹ In a case where several Templars murdered Christian merchants, they were sentenced to be brutally whipped through various regions of the Middle East before being incarcerated in a castle where they later died (Bevan, 2020).

²² The pope still wanted to hear Molay’s side of the story, and when questioned by papal legates Molay retracted his earlier confessions made under torture. A power struggle ensued between the king and the pope, which was settled in August 1308 when they agreed to split the convictions. In 2001, a document was discovered in the Vatican Secret Archives which confirms that in 1308 Pope Clement V absolved Jacques de Molay and Geoffrey de Charney. Nevertheless, the king had them executed.

²³ This took place on the Ile des Javiaux, an island in the Seine River. The island can now be reached from a stairway descending to it from the Pont-Neuf bridge (it is a launch point for boat tours of the Seine). There is plaque on one of the bridge abutments marking the site of Jacques de Molay’s execution.

²⁴ The records of the Templars disappeared after the downfall of their order, but it is almost certain that the earlier Geoffrey de Charny was an uncle or great uncle of the

later one (Wilson, 2010, p. 209).

²⁵ Many if not most of these images were not created with an intent to deceive, but rather as a piece of art intended to inspire worshippers.

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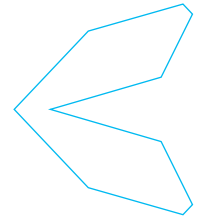
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**RESEARCH
ARTICLE**

Which Kind of and How Much Disruption to the Symmetry of Double-Slit Is Necessary for the Fringe Pattern Changes Conjectured to Have Seemingly Manifested Psychophysical Faculty?

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HIGHLIGHTS

A new study suggests that it could take no more than 10 picowatts (a picowatt is one millionth of one millionth of one watt) of power for matter to be affected by the human mind.

ABSTRACT

Identifying the most plausible cause of the fringe pattern changes in the double-slit of psychophysical domain (Radin et al., 2012, 2013) not only is instrumental to the understanding of the nature of psychophysical effects that may manifest but also will shed light on the effecting mechanism of such anomalous faculty should it be quantifiable. We implement computer simulations of double-slit fringe patterns based on the Huygens–Fresnel principle using the primary experimental geometrical parameters of Radin et al. (2013) to assess how an asymmetry of the double-slit configuration could affect the fringe visibility. The main result is that the normalized interference fringe corresponding to an asymmetry of the electrical field magnitude of 3/1 or 1/3:1 as was modeled by Radin et al. (2013) is grossly indifferent from that caused by an asymmetry of the spectral bandwidth of 0.00205 nm between the two slits at 632.8 nm center wavelength. A spectral broadening of 0.00205 nm of the light for the experimental setting utilized by Radin et al. (2013) could correspond to a power change of no more than 10 picowatts. Further studies are warranted to test this hypothesis towards understanding the nature of psychophysical faculty as was conjectured with Radin’s double-slit experiments.

KEYWORDS

Double-slit experiments, mind–matter, psychophysical faculty, asymmetry, psychophysical reality, transduction of energy, psychophysical effects, double-slit interference fringe patterns, spectral bandwidth, photonic properties, phase sensitivity,



1. INTRODUCTION

Psychophysical phenomena of various scales have been investigated by many laboratories over nearly a century's span using contemporary scientific instruments and statistical methodologies (Pratt, 1949; Rhine 1963; Schmidt, 1973; Tart et al., 1980; Jahn, 1982; Radin, 1982; Utts, 1986; McConnell, 1989; Dunne & Jahn, 1992; Bierman, 1996; Alexander, 2019; Giroladini & Pederzoli, 2021). However, the lack of a plausible physical mechanism to account for the intriguingly exhibited mind-matter interaction has prevented psychophysical research from being well-regarded by the physical science community (Shewmaker & Berender, 1962; Jamali et al., 2019; Tremblay, 2019; Walleczek & von Stillfried, 2019). Irrespective of the discipline, what physical science concerns would rest eventually on the transformation or transduction of energy between two different forms or states that may manifest as the change of a measurable physical property. For a phenomenon that does not result in a measurable change of any physical property, perhaps no psychophysical effects could be speculated about. On the other hand, however, one might encounter measurable changes of a specific physical property of which the cause could not be attributed unambiguously to a single factor or a specific pathway of affecting between an identifiable cause and an observable effect. Such uncertainty in terms of the explicability could be particularly intractable to the experiments of psychophysical essence.

In the optical domain, the diffraction pattern is substantiated by the phase behavior of light being a wave. Since the phase of light is sensitive to a length-change or an energy-variation or a power-shift corresponding to a sub-wavelength scale, the fringe pattern formed specifically by interferometric configuration that helps magnify the differential phase distribution or variation of the light field has allowed investigating phenomena that are too subtle to be measured by other means (Yacoby et al. 1994; Sztul & Alfano, 2006; Gachet et al., 2010; Lee et al., 2013). The extremely high sensitivity of interferometry has been taken advantage of in the pursuit of macroscopically quantifiable experimental demonstration of psychophysical faculties (Nelson et al., 1981, Jahn, 1982). Unfortunately, until a causally plausible mechanism in terms of the time-invariability and perhaps an intention-invariability could be entertained, or the role of mind in physics can be untangled (Klein & Cochran, 2017), changes of physical properties registered by instruments assumed to have evinced psychophysical faculty will remain controversial (Tremblay, 2019; Walleczek & von Stillfried, 2019), as they would be fundamentally difficult to replicate (Piao, 2021) due to the inability to apply adequate control of experi-

mental conditions—which arguably is the inevitable outcome of incomplete knowledge with regard to what those conditions really are.

As early as 1981, a Fabry-Perot interferometer illuminated by an incoherent light source (diffuse sodium lamp focused by a lens system) was implemented to test the possibility of psychophysical influence on altering the interference fringe patterns (Nelson et al., 1981). The engagement of a light source with high spatial and temporal coherence such as a laser, has allowed resolving fringe pattern variations at much higher fringe resolution or phase sensitivity than would be possible by using incoherent light sources. Following those early investigations based on interferometry, Radin et al. (2012, 2013, 2016) reported on variations in the interference fringe patterns in laser-engaged double-slit interferences. The fringe patterns in those studies were reported to have degraded in the fringe visibility which occurred in neurophysiological conjunction with an application of intention by a subject. The degradation of the visibility of the interference fringe from its baseline corresponded to a comparative reduction of the double-slit spectral power to its single-slit spectral power, which was conjectured to have manifested psychophysical influence since no other factors could be attributed to it (Radin et al., 2012). In accounting for the observation of the fringe visibility change, Radin et al. applied the Fraunhofer model of far-field light distribution to double-slit interference by considering that the light passing through the two slits could have esoterically reached an asymmetry due to psychophysical influence. Quantitatively, a 3:1 asymmetry of the electrical field magnitude of light between the two slits was demonstrated to be able to produce changes to the interference fringe with the fringe visibility close to that registered experimentally.

This present work puts forward an alternative model-interpretation of the reported change of fringe-visibility of the double-slit interference of Radin et al. We theorize that a change to the double-slit interference fringe pattern at the level reported by Radin et al. could very well, or highly more likely be caused by, a slight asymmetry of the spectral bandwidth of the light passing the two slits. This result could shed novel insights on the esoteric features of the conjectured psychophysical influence on double-slit interference.

Realizing this, we implemented computer simulations based on the Huygens-Fresnel principle using the primary geometrical parameters of the double-slit experiments of Radin et al. to assess how an asymmetry of the two slits in either a physical dimensional property or a photonic/spectral property would alter the interference fringe pattern. For fringe patterns that may be grossly difficult to differentiate based on the fringe visibility alone, Fourier

transformation of the fringe pattern is conducted to infer differences or deviations from the baseline that otherwise might be subtle.

The rest of this paper is structured as follows: **Section 2** outlines the gross geometry of the double-slit as well as the general approach of discretization for the computer simulation. **Section 3** details the asymmetries configured for the double-slit for assessing the effect of each kind of asymmetry on the fringe pattern. Asymmetries to the double-slit are introduced by changing the physical length-dimensional properties or photonic/spectral properties of one slit. Section 3 then presents the simulated outcomes of the double-slit interference fringe patterns for the asymmetries specified. When prompted, Fourier transform of fringe patterns associated with a specific asymmetry is conducted to examine the similarity of the power spectrum with the experimental data reported by Radin et al. An outcome of the computer simulation is cross-examining the analytical modeling of Radin et al. in terms of the effect of an asymmetry of the electrical field magnitude of 3:1 and 1/3:1 between the two slits. A fringe pattern of near-identical fringe visibility is produced by introducing an asymmetry in the electrical field magnitude (1/2:1, 1/3:1, 1/4:1, 1/5:1, and 1/6:1) and implementing an asymmetry on the spectral bandwidth (0.0017, 0.00205, 0.00223, 0.0037, and 0.0047 nm). **Section 4** discusses the power changes necessary for two specific conditions of asymmetry that are shown to produce fringe patterns grossly indifferent in terms of the visibility, one has an asymmetry of 1/3:1 on the electrical field magnitude akin to that modeled by Radin et al. and the other has an asymmetry of 0.00205 nm on the spectral bandwidth. The Appendices benchmark the computer simulation for the single-slit of various slit-widths and the symmetric double-slit with various slit-widths or slit-separations.

2. GROSS GEOMETRY OF THE DOUBLE-SLIT FOR COMPUTER SIMULATION

The goal of this work is to use computer simulation applying the Huygens–Fresnel principle to assess how an asymmetry of a double-slit would alter the interference fringe patterns. Toward that end, it becomes imperative to first evaluate the computer simulation methodologies for a single-slit with various slit widths to validate that the simulation accurately produces the known quantitative patterns of diffraction as a function of the slit-width at a given slit-to-screen distance. Further it becomes necessary to evaluate the computer simulation outcomes for a symmetric double-slit at various slit widths and various slit separations to also validate that the simulation replicates the known quantitative patterns of double-slit interference as a function of either the slit-width or the slit-separation at

otherwise fixed configuration. These two aspects of validations of the computer simulation approach are presented as the Appendices. The computer simulation is then applied to an asymmetric double-slit to assess which kind of asymmetry could have caused the interference fringe change as was reported by Radin et al. The computer simulation also serves to cross-verify the model results of Radin et al. based on the Fraunhofer far-field approximation.

The gross geometry of the double-slit to be configured to have a single aspect of asymmetry is illustrated in Figure 1. The following describes the setting of the baseline symmetric double-slit. Two slits of the widths of $2b = 10 \mu\text{m}$ are placed symmetrically with respect to a center that is located at a distance of l from a plane of observation that is parallel to the plane containing the two slits. An optical axis bisecting the double-slit is perpendicular to the observing plane. The two slits are spaced at a center-to-center distance of $w = 2a = 186 \mu\text{m}$ and the slit-screen distance is set as $l = 14.1 \text{ cm}$ to be consistent with the values fitted to the experimental data by Radin et al. (2012, 2013). In a Cartesian coordinate, the optical axis bisecting the double-slit is assigned the Z dimension, the direction along the slit's longer opening is assigned the Y dimension, and the direction along the slit's narrow opening or the width is assigned the X dimension. The slit is assumed to be infinitely long along the Y dimension to make the field of diffraction on the observation plane to be one-dimensional along the X dimension. The light distribution on the observing screen is assessed over a total lateral range of 21 mm along the X dimension that is centered at the Z-axis. This total lateral range of 21 mm is set to equal the total range of observation covered by the pixels of photo-electronic detectors used to register fringe patterns in the experiments of Radin et al. (3000 pixels, $7 \mu\text{m}$ per pixel). The wavelength of light is set as $\lambda_0 = 632.8 \text{ nm}$, as was used by Radin et al. and throughout the rest of this work unless otherwise specified. The light field illuminating the slit is assumed to be uniform. This baseline configuration of the symmetric double-slit thus carries the primarily geometric parameters of the experimental setup of Radin et al. An asymmetry may be introduced to the double-slit by changing one parameter of a slit while keeping the other slit unchanged. The parameters to change may include slit width, slit's lateral position, and intensity, wavelength, and bandwidth of light, among others.

The computer simulation has been programmed in MATLAB 2020a (Mathworks, Natick, MA). Computer simulation of the fringe patterns of the double-slit is realized by the following approaches of numeration. Each of the two slits in Figure 1 is discretized to 201 elements. The lateral coordinate of an n -th element of slit 1 with respect to the center of slit 1 is denoted by x_{1n} . A point on the observation

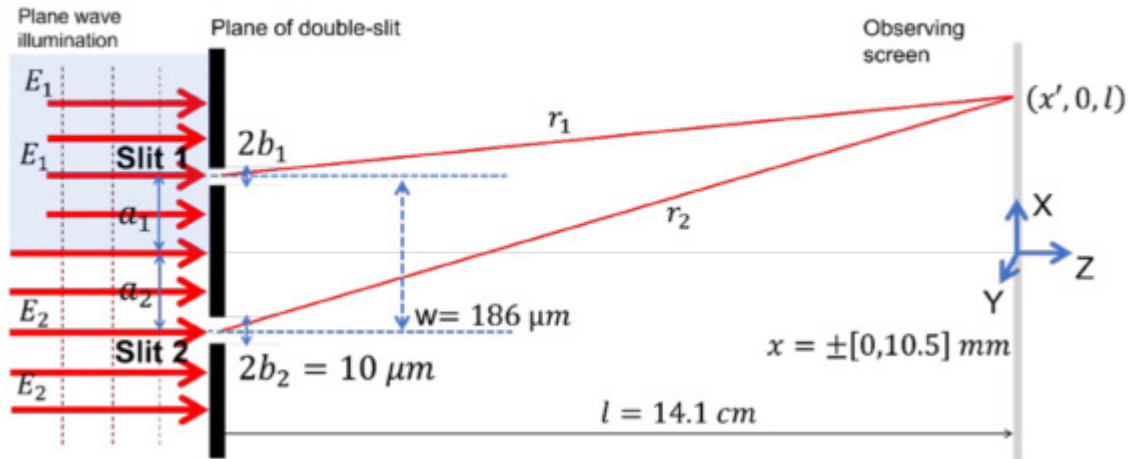


Figure 1. Schematic of a double-slit that may have one type of asymmetry for the parameters between the two slits. The symmetric baseline has a slit-separation of 186 μm , a slit-width of 10 μm , and a slit-to-screen distance of 14.1 cm. The light field on the observing screen is assessed over a total lateral range of 20 μm centered at the Z axis.

plane at a lateral distance of x' with the coordinates of $(x', 0, l)$ has an illumination distance of

$$r_{1n} = \sqrt{l^2 + (x' - a - x_{1n})^2} \quad (1)$$

from the n -th element of slit 1. Assuming that slit 1 is on the iso-phase-front of a planar wave of a field intensity of E_{10} , all differential elements of the slit then act as sources of identical strength. The complex electrical field of light at x' , originating from the differential source element x' , is

$$E_{1n}(x', 0, l, x_{1n}) \propto E_{10} \frac{1}{r_{1n}} \exp(jk_0 r_{1n}). \quad (2)$$

Likewise, the lateral coordinate of an n -th element of slit 2 with respect to the center of slit 2 is denoted by x_{2n} . Assuming that slit 2 is on the iso-phase-front of a planar wave of a field intensity of E_{20} , a point on the observation plane at a lateral distance of x' , with the coordinates of $(x', 0, l)$, has an illumination distance of

$$r_{2n} = \sqrt{l^2 + (x' + a - x_{2n})^2} \quad (3)$$

from the n -th element of slit 2. The complex electrical field of light originating from the differential source element x_{2n} is:

$$E_{2n}(x', 0, l, x_{2n}) \propto E_{20} \frac{1}{r_{2n}} \exp(jk_0 r_{2n}) \quad (4)$$

The composite complex electrical field of light on the point $(x', 0, l)$, by all discrete elements of both slits of the double-slit is then $E_{\text{double}}(x', 0, l) =$

$$E_{\text{double}}(x', 0, l) = \sum_{n=1}^N [E_{1n}(x', 0, l, x_{1n}) + E_{2n}(x', 0, l, x_{2n})] \propto \sum_{n=1}^N \left[\frac{E_{10}}{r_{1n}} \exp(jk_0 r_{1n}) + \frac{E_{20}}{r_{2n}} \exp(jk_0 r_{2n}) \right] \quad (5)$$

The light intensity distribution on the observing plane is then $I_{\text{double}}(x', 0, l) = E_{\text{double}}(x', 0, l) \times E_{\text{double}}^*(x', 0, l)$, which is the interference pattern registered by a photo-electronic array. A symmetric double-slit illuminated by monochromatic light may have $E_{10} = E_{20}$ in addition to equal slit-widths and symmetric slit-center with respect to the optical axis.

3. COMPUTER SIMULATION OF THE DOUBLE-SLIT WITH A SINGLE ASYMMETRY

The goal of this simulation study is to assess which kind of disruption to the symmetry of double-slit could have led to fringe pattern changes as were registered by Radin et al. We note that Radin et al. did not specifically document an experimental fringe pattern that deviated from the baseline when registered under the exclusive condition of the conjectured psychophysical influence. However, according to Radin et al., their analytical modeling of the double-slit with an unequal electrical field magnitude between the two slits at a ratio of 3:1 (1.5:0.5 over the baseline of 1:1) produced a fringe pattern close to what was measured experimentally. Figure 2 reprints with permission from the publisher the baseline fringe pattern and the altered pattern associated with the unequal electrical field of 3:1. These two fringe patterns were the model outputs of Radin et al. by using the Fraunhofer far-field approximation of the Huygens-Fresnel principle. These two patterns are displayed with the aspect ratio adjusted to make them look similar to the experimental fringes for the convenience of gross visual assessment hereafter.

As can be seen from Figure 2, the most perceivable difference between the baseline fringe pattern and the one

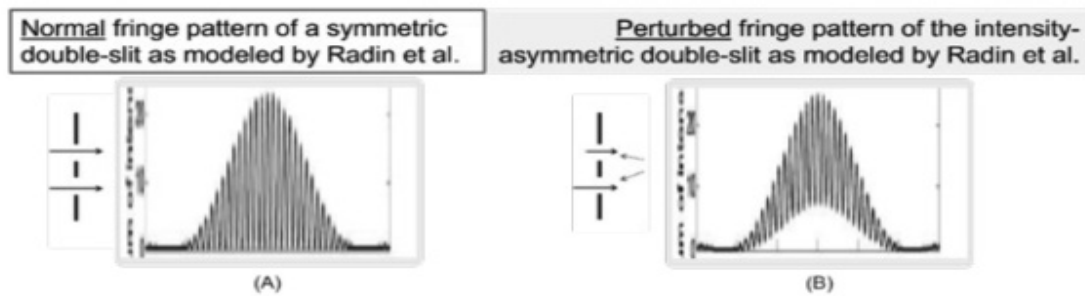


Figure 2. (A) The double-slit fringe pattern modeled by Radin et al. at normal condition when free of psychophysical influence, corresponding to a symmetric double-slit. **(B)** The double-slit fringe pattern modeled by Radin et al. corresponding to an asymmetry in the electrical field magnitude. Reprinted with permission.

with deviation due to unequal electrical field magnitude is the reduction of the oscillation appearing as an elevation of the lower/inner contour of the oscillating trace from the near-zero line to approximately 40% of the upper/outer contour of the oscillating trace. This reduction of the oscillatory portion over the baseline is the change of fringe visibility as was analyzed by Radin et al. An objective of the computer simulation is to find which kind of asymmetry of double-slit could produce a fringe pattern that deviates from the baseline as in Figure 2B. Any conditions of the double-slit that could lead to fringe patterns as in Figure 2B shall be given consideration in interpreting the experimental changes of the fringe under the conjectured psychophysical effects. And between two conditions leading to the similar level of fringe pattern changes in terms of the fringe visibility, the one that takes lower energy change, or equivalently smaller power, will be more likely to happen by thermal dynamic probability.

3.1. Asymmetry in the Physical Length Dimension of the Double-Slit

This section presents the simulation results of the fringe of double-slit that has one physical dimension changed from the baseline symmetric configuration. The symmetry of the physical dimensions of the double-slit is to be altered in the following aspects: an asymmetry in the slit opening, or an unequal slit width; an asymmetry in the slit offset, or a shift of one slit laterally from the baseline position of an ideally symmetric configuration.

3.1A. Asymmetry in the lateral offset of the slit-center. The effect of the slit-offset with respect to the baseline on the double-slit interference fringe pattern is illustrated in Figure 3. The asymmetry in the slit center offset is configured by changing the center of the upper slit or slit 1 with respect to the baseline position. The number of differential

elements of the slit is the same between the two slits so the total intensity of the slit would remain the same while the center of the slit is shifted laterally. The change in the fringe pattern then correlates with the asymmetry of the slit-center only. The upper panel illustrates the evolution of the asymmetry, which is to laterally shift the slit center with respect to the baseline position at a slit separation of $186 \mu\text{m}$. A lateral center-offset of slit 1 of respectively $-75 \mu\text{m}$ and $-50 \mu\text{m}$ led to a slit-separation of respectively $111 \mu\text{m}$ and $136 \mu\text{m}$, causing the geometric center of the two slits to misalign with respect to the baseline-optical axis of respectively $37.5 \mu\text{m}$ and $25 \mu\text{m}$ toward slit 2. A lateral center-offset of slit 1 of respectively $50 \mu\text{m}$ and $75 \mu\text{m}$ led to a slit-separation of respectively $236 \mu\text{m}$ and $261 \mu\text{m}$, causing the geometric center of the two slits to misalign with respect to the baseline-optical axis of respectively $25 \mu\text{m}$ and $37.5 \mu\text{m}$ away from slit 2. The upper panel illustrates the effective slit-separation caused by the lateral shift of the upper slit. The resulted fringe pattern is shown in the lower panel. The plot at the middle corresponds to the fringe pattern of a symmetric double-slit as is identical to the one in Figure 2A. None of the fringe patterns of the lower panel in Figure 3 resembles the one in Figure 2B.

The change of the fringe pattern as shown in Figure 3 can be appreciated as the following by referring to the Appendices. A change to the lateral position of one slit of the double-slit with the slit-width fixed effectively changes the slit-separation, as well as the offset of the center of the observing panel with respect to the effective center of the double-slit. The change in slit-separation causes the high-frequency pattern of the interference formed by two slits to change in frequency. The constant slit-width, however, maintains the envelope that modulates the high-frequency pattern. Reducing the lateral offset of one slit thus causes the fringe to become sparser, and conversely increasing the lateral offset of one slit makes the fringe

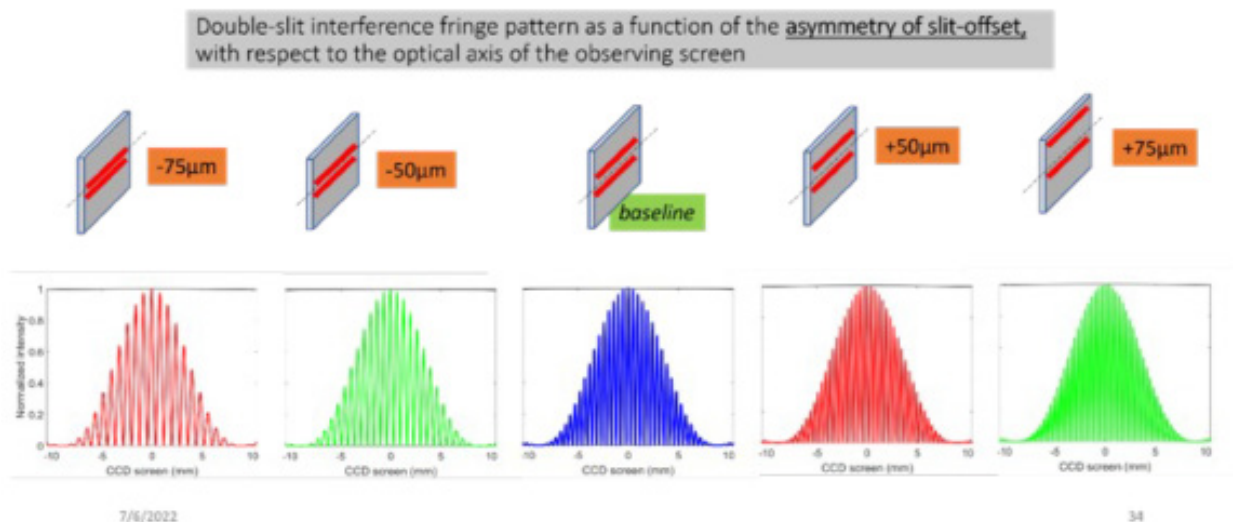


Figure 3. Double-slit interference fringe as a function of the asymmetry in geometry, specifically the offset of the slit center with respect to the baseline optical axis. **Upper panel:** The offset of the slit center, from $-75\ \mu\text{m}$, $-50\ \mu\text{m}$; baseline, $50\ \mu\text{m}$, and $75\ \mu\text{m}$. **Lower panel:** The fringe pattern corresponding to the asymmetry of slit-width.

denser, but there is no change in the envelope. As a result, the gross visibility of the fringe seems unchanged.

3.1B. Asymmetry in the slit-width of the double-slit. The effect of the asymmetry of the slit-width on the double-slit interference fringe pattern is illustrated in Figure 4. The asymmetry in the slit-width is configured by changing the width of the upper slit or slit 1 to respectively $1/5$, $1/2$, 2 times, and 5 times the baseline. The center-to-center distance, or the slit-separation, is fixed at $186\ \mu\text{m}$. The number of differential elements of the slit are the same between the two slits so the total intensity of the slit would remain the same between the two slits. The change in the fringe pattern then correlates with the asymmetry of the slit-width only. The upper panel illustrates the evolu-

tion of the asymmetry of the slit-width, from $1/5:1$ to $1/2:1$, then to baseline, then to $2:1$, and then to $5:1$. The lower panel presents the corresponding fringe pattern. The plot at the middle that corresponds to the fringe pattern of a symmetric double-slit is identical to the one in Figure 2A. None of the fringe patterns of the lower panel resembles the one in Figure 2B.

The change of the fringe pattern shown in Figure 4 is appreciable in two aspects by projecting the patterns to limiting cases while referring to the Appendices. Let's assume that one slit increases in width to overlap with the other slit. That would make the double-slit-ness disappear and the configuration essentially becomes a single-slit of a significant width of more than $186\ \mu\text{m}$. The total

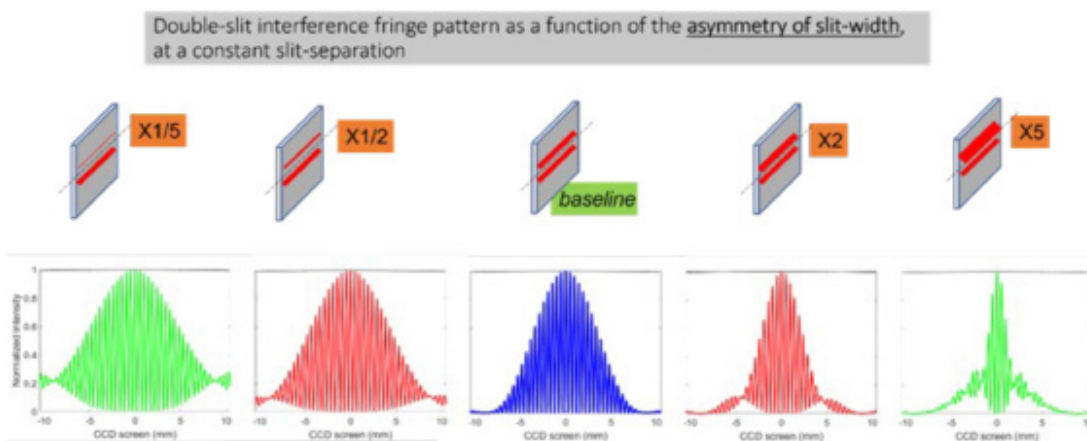


Figure 4. Double-slit interference fringe as a function of the asymmetry in the slit-width. **Upper panel:** asymmetry of the slit-width, from $1/5:1$ to $1/2:1$ to $2:1$ and $5:1$. **Lower panel:** the corresponding fringe pattern.

intensity field on the screen of observation then should be a sinc-function with a very narrow center lobe due to the large slit-width. Conversely, let's assume that the width of one slit decreases to zero. That would make the electrical field of light on the observing screen be the superposition of a double-slit of infinitely thin slit-width with a single-slit of finite width that is offset from the optical axis of the double-slit. The combined effect would cause a change in the center lobe of the fringe pattern and a change in the modulation of the lobe between the troughs.

3.2 Simulation of the Double-Slit with an Asymmetry in the Photonic Properties

This section assesses how an asymmetry of the double-slit in the photonic/spectral properties affects the interference fringe. The disruption to the asymmetry is implemented by changing one parameter of the light associated with one slit while maintaining the light associated with the other slit. The properties to be altered include the magnitude of the electrical field, the wavelength, and the spectral bandwidth of the light.

3.2A. Asymmetry in the electrical field magnitude.

Figure 5 assesses the change of the double-slit interference fringe pattern as a function of the asymmetry in the electrical field magnitude of the light between the two slits. The asymmetry in the electrical field magnitude is

configured by keeping the electrical field magnitude of the lower slit or slit 2 at the baseline and scaling the electrical field magnitude of the upper slit or slit 1 with respect to the baseline value. The total number of the discretized elements remains unchanged, and the scaling of the electrical field magnitude applies equally to all elements. The asymmetry of the electrical field magnitude is approached in two ways. The first set sets the electrical field magnitude of the light of slit 1 at respectively 1.05, 1.1, 1.5, 2, and 3 times the baseline value. The second set sets the electrical field magnitude of the light of slit 1 to respectively 1/1.05, 1/1.1, 1/1.5, 1/2, and 1/3 times the baseline value. These two sets result in the same inter-slit ratio of the electrical field magnitude. The resulting fringes that are normalized with respect to their respective peak value are displayed as the upper panel in Figure 5 for the former setting and the lower panel in Figure 5B for the latter setting.

The following observations can be made with Figure 5. As the asymmetry of the electrical field magnitude between the two slits escalates, the fringe visibility degrades. However, the visibility of the normalized fringe is indifferent between the two settings with the same inter-slit ratio, regardless of which slit has the higher field magnitude. And the two fringes at the right-most, one corresponding to an asymmetry of 3:1 and the other 1/3:1, resemble Figure 2B. This result thus cross-validates the modeling of Radin et al.

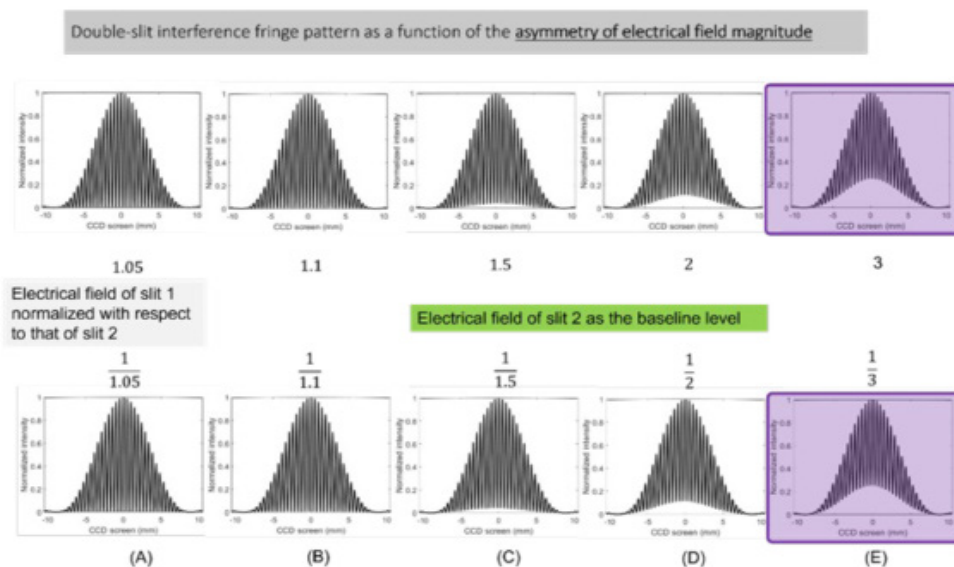


Figure 5. The change in the double-slit interference fringe pattern as a function of the asymmetry in the magnitude of the electrical field of the light. The asymmetry is configured by keeping the electrical field magnitude of one slit (the lower slit) at the baseline while scaling the electrical field magnitude of the other (the upper slit) with respect to the baseline value. The two framed plots corresponding to an asymmetry of 1:3 of the magnitude of the electrical field between the two slits are grossly different from the one in Figure 2B.

conducted by means of Fraunhofer approximation of the far-field distribution of the light field.

3.2B. Asymmetry of the slit's wavelength in the double-slit. Figure 6 compares the change of the double-slit interference fringe pattern as a function of the asymmetry of the wavelength of light. The asymmetry in the wavelength of the slit is configured by keeping the lower slit or slit 2 at baseline while changing the wavelength of the upper slit or slit 1 with respect to the baseline value (632.8 nm). The number of differential elements of the slit are the same between the two slits and so is that of the magnitude of the light field. Therefore, the only difference between the two slits is the center wavelength that changes the propagation constant to produce extra phase difference between the paths of beams originating from the two slits. The upper panel of Figure 6 illustrates the evolution of the asymmetry, as the offset of the center wavelength of slit 1 with respect to the baseline: -10 nm (622.8 nm for slit 1), -5 nm (627.8 nm for slit 1), 5 nm (637.8 nm of slit 1), and 10 nm (642.8 nm of slit 1). The corresponding fringe pattern is presented in the lower panel of Figure 6. The plot at the middle corresponds to the fringe pattern of a symmetric double-slit as is identical to the one in Figure 2A. It can be observed that the asymmetry in the wavelength of light causes the fringe oscillation to become asymmetric, even though the asymmetry does not obviously affect the fringe visibility. The asymmetry, however, may impact the frequency components when revealed by Fourier transform. But nonetheless, none of the fringe patterns of the lower panel with asymmetry in wavelength resembles the one in Figure 2B.

3.2C. Asymmetry in the spectral bandwidth of the light of the double-slit. Figure 7 presents the change of the double-slit interference fringe pattern as a function of the asymmetry of the spectral bandwidth. The asymmetry in the spectral bandwidth is configured by keeping the light properties of the lower slit or slit 2 at the monochromatic baseline while changing the bandwidth of the upper slit or slit 1. The number of differential elements of the slit are the same between the two slits and so is that of the magnitude of the light field, and the center wavelength of the light of slit 1 is 632.8 nm as is the monochromatic light of slit 2. For each of the 201 discretized elements of slit 1, it is further discretized to a total of 21 spectral elements that span over the total bandwidth as specified. And the light field of each of these 21 spectral elements is given a weight of 1/21 of that of the single element among the 201 discretized elements of slit 2. This allows the total light intensity of slit 1 with spectral broadening be the same as that of slit 2 maintained at the baseline to make the fringe change represent the effect of the spectral bandwidth only.

The two-row panel of Figure 7 going clockwise illustrates the evolution of the fringe as the spectral bandwidth of slit 1 increases from 0.001 nm, 0.004 nm, 0.01 nm, 0.1 nm, 1 nm, 2 nm, 5 nm, to 10 nm. The framed plot singled out at the left is a reprint of Figure 2B. As the asymmetry of the spectral bandwidth starts to pick up from the baseline, the fringe visibility decreases initially. The fringe visibility approaches nearly zero at 0.1 nm of the spectral bandwidth. And as the asymmetry in the spectral bandwidth increases further from 0.1 nm, the fringe visibility increases but the

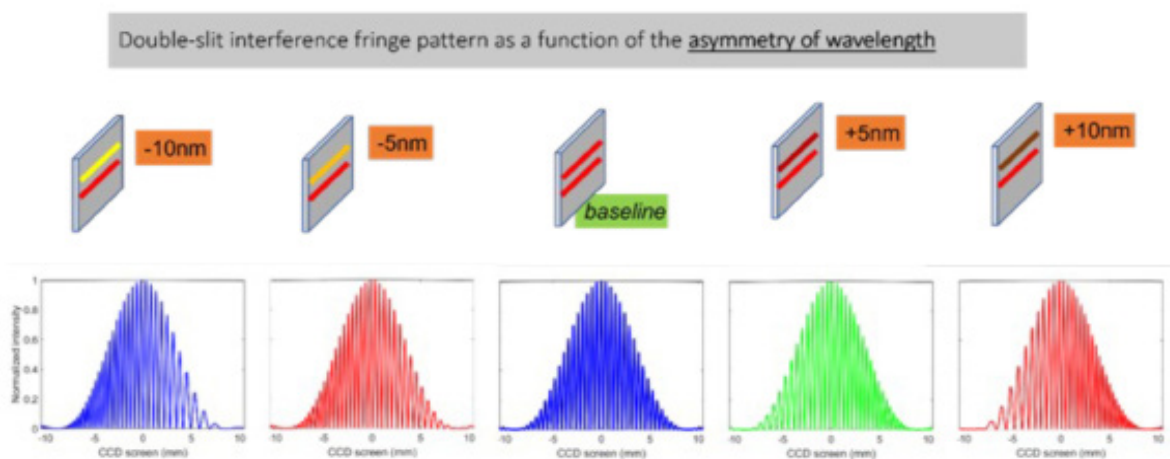


Figure 6. Double-slit interference fringe as a function of the asymmetry of the wavelength. **Upper panel:** the offset of the center wavelength, from -10nm, -5nm, baseline, 5 nm, and 10 nm. Lower panel: the fringe pattern corresponding to the asymmetry of slit-center wavelength. The plot at the middle corresponds to a symmetric double-slit identical to that in Figure 2B.

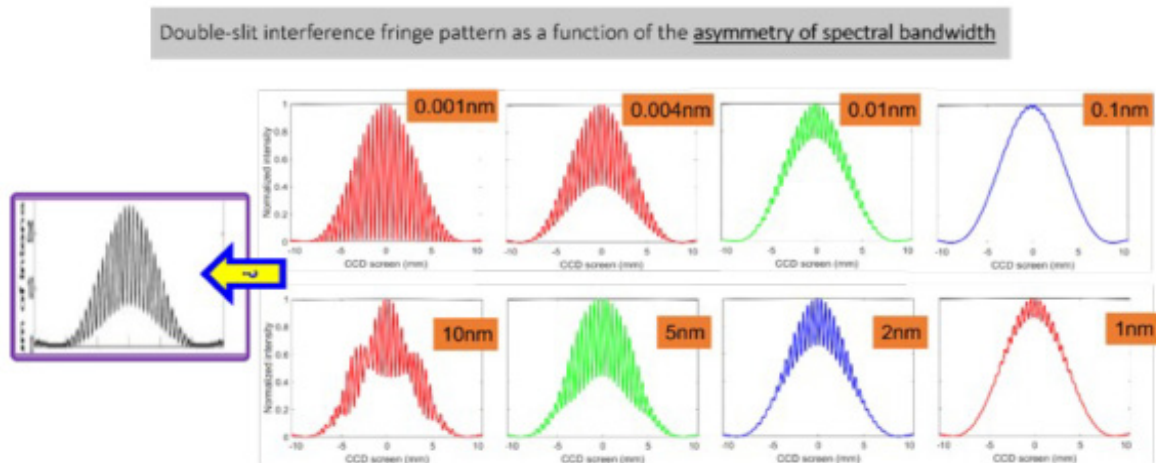


Figure 7. Double-slit interference fringe pattern as a function of the asymmetry of the spectral bandwidth. **Upper panel:** The bandwidth of the light of one slit is 0.001 nm, 0.004 nm, 0.01 nm, and 0.1 nm (in order from left to right). **Lower panel:** The bandwidth of the light of one slit is 1 nm, 2 nm, 5 nm, and 10 nm (in order from left to right). The framed plot singled out at the left (Radin et al., 2013) is reprinted with permission from *Physics Essays*.

global shape of the fringe deviates remarkably from that of the baseline. The fringe visibility of the one corresponding to the 5 nm asymmetry may be grossly analogous to that in Figure 2B, but the outer and inner contours are significantly different from those in Figure 2B. The fringe visibility of the one corresponding to the 0.004 nm asymmetry seems grossly very close to that in Figure 2B. This encourages further analysis with finer resolution in the spectral bandwidth.

3.3. Fourier Transform to Compare the Effects of Asymmetry in the Electrical Field Magnitude and the Outcomes of Asymmetry in the Spectral Bandwidth

We argue that the fringes formed by the 3:1 or 1/3:1 of asymmetry of the electrical field magnitude of light as shown in Figure 5 (the right-most pair) resemble remarkably the fringe corresponding to a 0.004 nm asymmetry in the spectral bandwidth as shown in Figure 7. We further demonstrate the analogy of the fringes formed by the two kinds of asymmetries over a greater range of the asymmetry of the electrical field magnitude and finer scale of the asymmetry of the spectral bandwidth, as shown in Figure 8. As shown in Figure 5, the fringe normalized to the center peak is grossly indistinguishable between an asymmetry of the electrical field magnitude of $\xi:1$ and that of ξ^{-1} where ξ is the inter-slit ratio of the electrical field magnitude. And in terms of the energy or power needed to change the electrical field magnitude, an asymmetry of 1/3:1 requires a 66.7% change of the light field magnitude

but an asymmetry of 3:1 requires a 200% change of the light field magnitude over the baseline. As a lower level of energy change or power is thermodynamically more plausible, in assessing the changes to the light field magnitude we chose to analyze the cases of reducing the light field magnitude of slit 1 over an increase in the light field magnitude of slit 1, given the same inter-slit ratio of the electrical field magnitude between the two slits.

Each of the sub-figures in Figure 8 contains two traces of fringe, one corresponding to an asymmetry of the electrical field magnitude and the other an asymmetry in the spectral bandwidth. For a specific level of the asymmetry of the electrical field magnitude, respectively $\frac{1}{2}:1$, $\frac{1}{3}:1$, $\frac{1}{4}:1$, $\frac{1}{5}:1$, and $\frac{1}{6}:1$, a fringe corresponding to the asymmetry of spectral bandwidth is tuned manually in the spectral bandwidth to make the two traces grossly indistinguishable based on the outer and inner contours. The traces shown correspond to an asymmetry of respectively 0.0017 nm, 0.00205 nm, 0.00223 nm, 0.0037 nm, and 0.0047 nm.

The Fourier transform of the two fringe patterns of the upper panel are displayed in the lower panel, following the same line styles (thickness and color) for the one with an asymmetry in the electrical field magnitude and the one with an asymmetry in the spectral bandwidth. Two observations can be made for the Fourier transform of the fringe patterns that are grossly indistinguishable in the fringe visibility. As the asymmetry in the electrical field magnitude increases, the shoulder of the single-slit power-peak escalates and the double-slit power reduces slightly. As the asymmetry of the spectral bandwidth intensifies, the

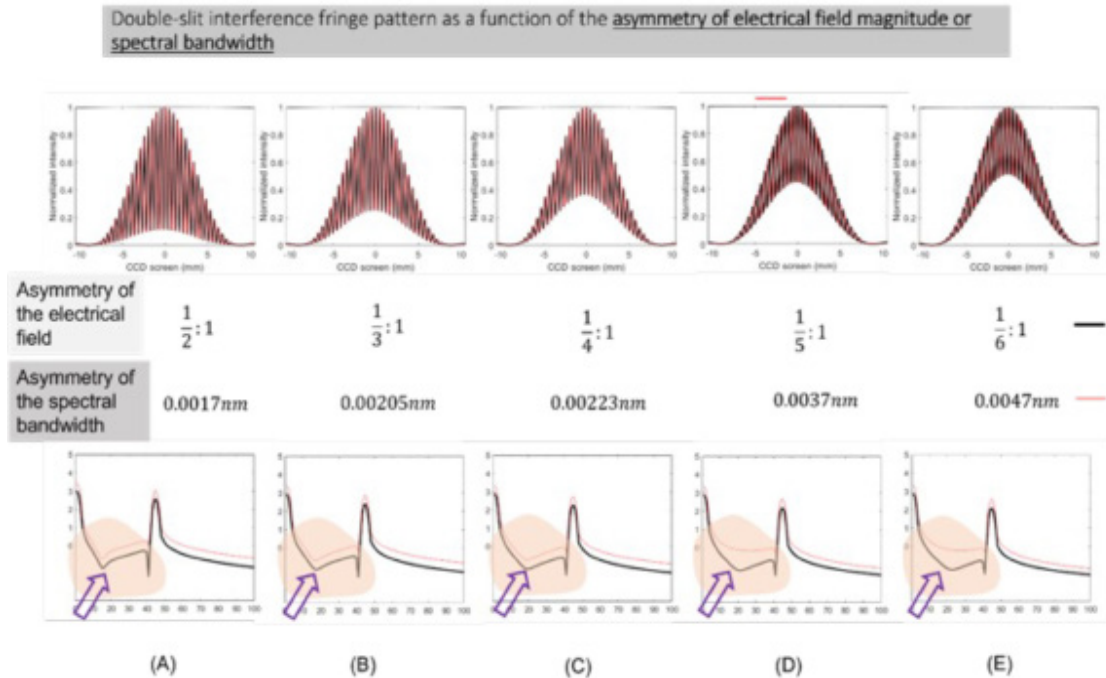


Figure 8. Upper panel: fringe patterns. The thick black fringe corresponds to an asymmetry of the electrical field magnitude and the thin red fringe corresponds to an asymmetry of spectral bandwidth. The upper and lower contours of the thick black line and thin red line are grossly identical. **Lower Panel:** the Fourier transform of the fringe pattern. The asymmetry of electrical field is 1/2:1 in (A), 1/3:1 in (B), 1/4:1 in (C), 1/5:1 in (D), and 1/6:1 in (E). The asymmetry of spectral bandwidth is 0.0017 nm in (A), 0.00205 nm in (B), 0.00223 nm in (C), 0.0037 nm in (D), and 0.0047 nm in (E).

shoulder of the single-slit power-peak elevates to a much greater extent than does the counterpart of the electrical field magnitude.

4. DISCUSSION

A double-slit in an ideal symmetric configuration leads to an interference fringe that appears as a sinusoidal carrier of 100% modulation depth with the amplitude enveloped by a squared sinc-function. The Fourier transform of the double-slit interference fringe reveals a spatial frequency component corresponding to the separation of the two slits, and a DC-bounding frequency determined by the width of the two identical slits. Any alteration to the slit-symmetry would cause a degradation of the spectral power ratio of the double-slit over single-slit from its native state corresponding to the baseline symmetry. An asymmetry between the two slits, however, could occur in various ways and therefore would not be represented only by an asymmetry in the electrical field magnitude between the two slits. As the double-slit interference is a phase-sensitive phenomenon, asymmetries in other properties of the double-slit, including spectral aspects such as the center wavelength and the spectral bandwidth, shall

not be excluded in interpreting a deviation of the interference fringe pattern from the baseline condition in the absence of a controllable or on-demand perturbation to the double-slit configuration.

What might have caused the fringe patterns in Radin's double-slit to deviate temporally from the normal condition is fundamental to the understanding of the nature of psychophysical effects that may manifest. We have demonstrated that increasing the spectral bandwidth of the light passing the slit of psychophysical intent of only 0.00205 nm at a center wavelength of 632.8 nm by keeping the same total spectral intensity to induce an asymmetry between the two slits could produce the fringe pattern changes corresponding to an asymmetry of electrical field magnitude of 1/3:1 as the replication of the modeled outcome of Radin et al. And the power spectrum of the fringe pattern corresponding to a 0.00205 nm broadening of the spectral-bandwidth of one slit seems to be noticeably closer to the experimental observation than that corresponding to a 1/3:1 inter-slit asymmetry in the electrical field magnitude. In the following, we estimate the power change that may be involved in the 0.00205 nm spectral broadening and the 1/3:1 asymmetry in the electrical field magnitude for the experimental configurations given by Radin et al.

The power change is the energy change evaluated over a given time. The energy change of light can be caused by either a number change of the photons at the same energy, or an energy change of the photons at the same total number of photons. The former corresponds to a change of the electrical field at a fixed color of the photons, and the latter corresponds to a change of the color of the photons at a fixed total number of photons.

A 3:1 inter-slit ratio of the electrical field magnitude can be configured by either a 3:1 or a 1/3:1 ratio of the electrical field magnitude between the two slits with respect to the baseline. A ratio of 3:1 of the electrical field magnitude leads to a ratio of 9:1 of the light intensity, or 800% of the change of the power with respect to baseline. A ratio of 1/3:1 of the electrical field magnitude leads to a ratio of 1/9:1 of the light intensity, or an 88.9% change in power with respect to baseline. Between these two conditions, the one that has lower power change will be more likely to happen thermodynamically, therefore we will assess the 88.9% case.

Let's assume that the number of photons amounting to the intensity of each discretized slit at the baseline is N_{total} . A reduction of the intensity to 88.9% corresponds to $88.9\% * N_{total}$ change in the number of photons associated with the discretized element of the slit. Consider that the spectral broadening of the light happens to each discretized element of the slit as the energy at a single wavelength being spread uniformly to a band of discrete wavelengths of a total number of $n_{spectral}$. The number of photons decomposed to each of the spectral composition is then $N_{total} / n_{spectral}$. A differential frequency $\Delta\nu$ over the center frequency ν_0 of light corresponds to a differential change $\Delta\lambda$ with respect to a center wavelength of λ_0 as $\frac{\Delta\nu}{\nu_0} = \frac{\Delta\lambda}{\lambda_0}$.

The differential energy (and equivalently the number of photons) of the n -th spectral decomposition over the baseline value is then $\frac{\Delta\nu_i}{\nu_0} = \frac{\Delta\lambda_i}{\lambda_0}$ where $\Delta\lambda_i = [0, \Delta\lambda_{max}]$ with $\Delta\lambda_{max}$ being one half of the total bandwidth of the spectral broadening. The total relative change of the number of photons corresponding to the entirety of the spectral decomposition for each discretized element of the slit is no greater than:

$$2 * N_{total} \left| \frac{\Delta\lambda_{max}}{\lambda} \right| = N_{total} \frac{0.00205}{632.8} = 3.24 \times 10^{-6} N_{total}. \quad (6)$$

Given that the intensity change or spectral broadening is estimated for the same resolution of discretizing the slit, the forgoing estimation leads to concluding that the spectral broadening of 0.00205 nm would take 3.64×10^{-6} times the change of photon numbers, and hence the power over the same duration of psychophysical action if incurred

needed to reach a 1/3:1 ratio of the electrical field magnitude.

It may be insightful to estimate the level of power-change corresponding to the afore-articulated 3.24×10^{-6} times the total power of the light in a slit of the double-slit of Radin et al. that would produce the fringe change comparable to that observed. According to Radin et al. (2013), a 5 mW laser passed through two 10% transmission neutral density filters would give a power illumination of 50 μ W to the double-slit 10 μ m slit width. Each slit would be placed at 100 μ m (based on the specification) from the center of the beam assuming a perfect alignment. For a collimated beam of an He-Ne laser with a cross-sectional diameter of 1 mm, assuming a top-hat beam profile, the 10 μ m slit close to the diameter of the cross-section would transmit approximately 0.63% of light, making the total power of the light passing one slit as 0.315 μ W. And 3.24×10^{-6} times this power corresponds to 1.0 pW. However, one may consider that laser beam profile is practically Gaussian, and any spectral broadening will likely be Gaussian as well which would require wider broadening to reach the same level of effect as is simulated with a uniform broadening. It may thus be safe to scale up 10 times of the power change needed to cause the expected amount of fringe visibility over what has been estimated as 1 pW, which makes 10 pW.

In the efforts to interpret the physical causes to the observed fringe pattern changes, there are perhaps two aspects of reasoning process that are consequential and not collateral, could the observed alteration to the fringe pattern changes be inexplicable by ordinary means devoid of intentional faculty. The first aspect of interpreting the observed change of the fringe patterns would be the following: Which kind of physical process could have caused that change of observation? And the second aspect of interpreting the observed change of the fringe patterns should be the following: How could the physical process indicated by the prior aspect correlate with the introduction of an intentional faculty directed to that effect? From the standpoint of energy-transformation or energy-transduction, a process that requires the lesser change of energy or power would be more likely to happen since the thermodynamic probability of an energy difference of ΔE decreases at a rate of $\exp(-\Delta E/E_t)$ where E_t is the thermal energy, should the thermal-dynamic condition not be violated. However, the question of how intentional faculty could possibly act upon a physically sensitive entity to cause a psychophysical effect being manifested is perhaps premature to be contemplated, until the most plausible physical cause or process that can account for the observed physical effects subjected to intentional faculty can be identified. Since double-slit interference is an optical phenomenon, the interpretation

of the fringe pattern deviation from a normal condition shall not prefer the intensity change over other kinds of parameter variation, as was stated by Nelson (1981): "Since the fringe position is also sensitive to the wavelength of the light source and to the index of refraction of the air between its plates, these parameters cannot be excluded as possible components in the PK interaction."

5. CONCLUSIONS

Computer simulation based on the Huygens–Fresnel principle has been implemented to assess how the double-slit interference pattern changes as the symmetry of double-slit is disrupted. We demonstrate that an asymmetry in the spectral bandwidth of the light between the two slits, specifically a 0.00205 nm uniform spectral broadening of the light at a center wavelength of 632.8 nm for one slit, can vary the fringe to have a visibility nearly indistinguishable from that due to an asymmetry of the electrical field magnitude of 1/3:1 as was modeled by Radin et al. As far as the change of energy or power is concerned, the 0.00205 nm spectral broadening of the light would take about 1/300,000th of the power of the 2/3 reduction of the electrical field magnitude of light to reach an inter-slit ratio of 1/3:1 of the electrical field magnitude, both at a center wavelength of 632.8 nm. The former one, which takes approximately 5 orders of magnitude less in power change than the latter one, could be much more plausible than the latter one. The amount of power involved in perturbing the spectral bandwidth of 0.00205 nm in the experimental setting of Radin et al. is estimated to be no more than 10 pW. The level of energy transformation or transduction pertinent to psychophysical intent may be worthy of experimental examination.

IMPLICATIONS AND APPLICATIONS

This study has challenged the interpretation of the physical cause of the fringe pattern changes in the double-slit experiments of Radin et al., revealing neurophysiological correlation with intentioned influence. Finding an alternative interpretation to the effect that takes just about 3.64×10^{-6} of the power of that modeled by Radin et al. is expected to open a new avenue for experimental approaches to target any energy-associative mechanism of psychophysical effects.

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Data-sharing Plan. The computer programs in MATLAB are available to share upon reasonable requests to the author.

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APPENDICES

Double-slit interference as a classical wave optical phenomenon has been known for more than 2 centuries (Young, 1804) and surrenders to accurate analysis by way of the standard wave approaches such as the Huygens–Fresnel principle which becomes Fraunhofer approximation at the far-field limit. The Huygens–Fresnel principle treats the light field from an aperture as the superposition of the light field originating from all differential elements of the aperture, each of which is treated as a point source of light radiation. And the light intensity as is registered on an observation plane is the product of the complex electrical field and the conjugate of that complex electrical field. The textbook analysis of double-slit interference usually attends to symmetrically configured double-slit (Ambrose et al., 1999). And analytical approaches that may be implemented straightforwardly for numerical evaluation have seldom treated the double-slit with an asymmetry and thus do not offer the flexibility of assessing the effect of various kinds of asymmetry on the fringe pattern as is needed for this work.

The goal of this work is to use computer simulation operations of the Huygens–Fresnel principle to assess how the asymmetry of double-slit would alter the interference fringe patterns to understand the possible physical causes or precursors to the changes in fringe visibility of double-slit as reported by Radin et al. The implementation of computer simulation based on the Huygens–Fresnel principle should facilitate arbitrary asymmetry configuration between the two slits. It is noted that the slit practically has a finite width even though the length of the slit may be idealized as being infinite. Unlike analytical treatment that can deal with the differential elements of a slit by integrating over the entirety of the slit-width, computer simulation must discretize a slit along the width and sum up the contributions from all those discrete elements. It thus becomes imperative to benchmark the performance of the computer simulation against the results known for

symmetric double-slit (Thompson & Wolf, 1957), prior to applying the computer simulation to an asymmetric double-slit to study the effect of each kind of asymmetry on the fringe pattern.

The spatial distribution of light field impinging on a symmetric double-slit can be treated as the spatial distribution of the light field impinging on a single-slit which has a width identical to each double-slit, convolving with the spatial distribution of the centers of the two slits. Since the radiation pattern of a source is mathematically proportional to the spatial Fourier transform of the source profile, the double-slit interference fringe is essentially a multiplication between the radiation pattern by a double-slit of infinitely small slit-width with the spatial Fourier transform of the single-slit's width function—a rectangular distribution for an ideal slit. Any change to the fringe pattern of a symmetric double-slit can thereby be understood effectively by assessing the overlay between a radiation pattern (square of a sinc-function) characteristic of a single-slit and a spatial pattern (oscillation) inherent to a double-slit of infinitely thin slit-width.

Toward that end, we first evaluate the computer simulation for a single-slit with various slit widths to validate that the simulation produces accurately the known quantitative patterns of diffraction as a function of the slit-width at a given slit-to-screen distance. We then evaluate the computer simulation for a symmetric double-slit at various slit widths and various slit separations to also validate that the simulation produces accurately the known quantitative patterns of double-slit interference as a function of either the slit-width or the slit-separation at otherwise fixed configuration. The computer simulation validated for single-slit and symmetric double-slit will then be applied

to double-slit configured with an asymmetry to assess which kinds of asymmetry could be relevant to the changes of interference fringe pattern reported by Radin et al. The computer simulation also serves to cross-examine the results of Radin et al. modeled with the Fraunhofer far-field approximation, which is the limiting case of the Huygens–Fresnel principle.

Appendix A. Validation of the Computer Simulation for Single-Slit at Various Slit Widths

We first establish a computer simulation based on the Huygens–Fresnel principle to produce the mundane pattern of single-slit diffraction. This step for validation serves to assure that the effect of the single-slit parameters on the light field on the observing screen of the double-slit is handled correctly. Meanwhile, this step would also help us visualize how the physical dimensional parameters of each of the two slits of equal width in the double-slit would affect the interference fringe pattern since the envelope that modulates the oscillation caused by the separation of the two slits in double-slit is controlled by the width of the two slits of equal width.

Appendix A1. Configuration of the single-slit for computer simulation. The geometric configuration of the single-slit used to validate the computer simulation approach of this work is illustrated in Figure A1. The slit of width $2b$ is placed at an axial distance of λ from a plane of observation that is perpendicular to the optical axis of the single-slit. The slit-screen distance is set as $\lambda = 14.1$ cm to make it consistent with the slit-to-screen distance in the double-slit experiment of Radin et al. (2012, 2013).

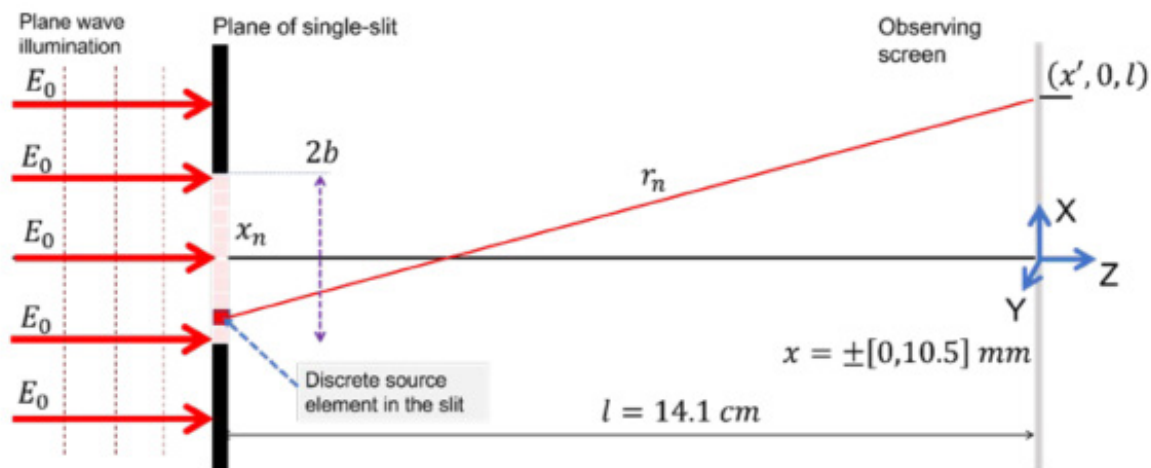


Figure A1. Schematic of single-slit configuration with the slit-to-screen distance and screen-size the same as those of the double-slit of Radin et al. (2013). The slit-width is denoted as $2b$. The slit-to-screen distance is 14.1 cm. The light field on the observation plane is assessed over a total lateral range of 21 mm symmetric to the optical axis that dissects the slit opening.

In a Cartesian coordinate, the optical axis bisecting the single-slit is assigned the Z dimension, the direction along the slit's longer opening is assigned the Y dimension, and the direction along the slit's narrow opening or the width is assigned the X dimension. The slit is assumed to be infinitely long along the Y dimension to make the field of diffraction on the observation plane one dimensional along the X dimension. The light distribution on the observing screen is assessed over a total range of 21 mm along the X dimension, or a bilateral range of 10.5 mm with respect to the Z-axis. This total lateral range of 21 mm is set to equal the total range of observation covered by the pixels of photo-electronic detectors used to register fringe-patterns in the experiments of Radin et al. (3000 pixels, 7 μm per pixel). The wavelength of light is set as $\lambda_0 = 632.8 \text{ nm}$.

According to the Huygens–Fresnel's principle, each differential element of an aperture is treated as a point source from which the light irradiates spherically. The single-slit is discretized to a total of n elements. The lateral position of the n -th element with respect to the slit center is denoted as x_n . A point on the plane of observation at a lateral distance of x' at the coordinates of $(x', 0, l)$ has an illumination distance of:

$$r_n = \sqrt{l^2 + (x' - x_n)^2} \quad (\text{A1})$$

from the n -th differential element on the slit. Assuming that the single-slit is on the iso-phase-front of a planar wave with an electrical field magnitude of E_0 , then all differential elements of the slit act as sources of identical strength. The electrical field of light impinging on

the observing plane and originating from a differential source element x_n is:

$$E_n(x', 0, l, x_n) \propto \frac{E_0}{r_n} \exp(jk_0 r_n), \quad (\text{A2})$$

where $k_0 = 2\pi/\lambda_0$ is the monochromatic propagation constant. The composite electrical field of the light on the point of observation of $(x', 0, l)$ originating from all discrete elements of the single-slit is

$$E_{\text{single}}(x', 0, l) = E_{\text{single}}(x', 0, l) = \sum_{n=1}^N E_n(x', 0, l, x_n) \propto \sum_{n=1}^N \frac{E_0}{r_n} \exp(jk_0 r_n). \quad (\text{A3})$$

The corresponding light intensity is then $I_{\text{single}}(x', 0, l) = E_{\text{single}}(x', 0, l) \cdot E_{\text{single}}^*(x', 0, l)$, which is the diffraction pattern of the single-slit that is actually registered by a photo-electronic array.

Since computer simulation using the Huygens–Fresnel principle cannot circumvent discretizing the slit into elements, the resolution of the discretization will affect the accuracy of modeling the light field on the plane of observation. It can be expected that the accuracy of modeling the light field on the plane of observation will improve as more elements are discretized over the slit. It can also be projected that as the number of discretized elements of the slit reaches a certain value, further increase will not indifferently change the composite light field after the contribution by all elements saturates. This work found it adequate to discretize the single-slit or each of the two slits of the double-slit to 201 elements.

Appendix A2. Diffraction patterns simulated for a

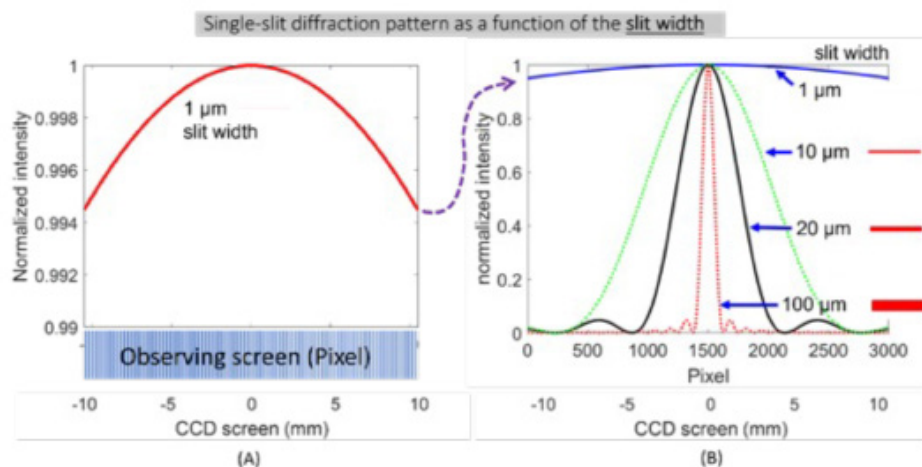


Figure A2. (A) The intensity of the diffracted field over a 21 mm span at a distance of 14.1 cm from a single-slit of 1 μm . The total 3000 pixels of the photo-electronic (denoted as CCD screen for convenience) array covers a 21 mm range or a $[-10.5, 10.5]$ mm range. The intensity of the diffraction field drops to $\sim 99.45\%$ at the edge of the observing range when compared to that at the center. (B) The evolution of the single-slit diffraction pattern as the slit-width increases. The slightly curved line atop the others is associated with a single-slit of 1 μm slit-width as is given in (A). The other curves are associated with slit-width of 10 μm , 20 μm , and 100 μm , at the order of reduced width of the center lobe.

single-slit at various slit widths. Figure A2 displays the simulated light intensity on the observing plane of the single-slit shown in Figure A1. The slit-width is set as one of the following: 1 μm , 10 μm , 20 μm , and 100 μm , respectively. Figure A1A corresponds to a slit-width of 1 μm and has the ordinate zoomed in to illustrate the small reduction of the light intensity ($\sim 0.55\%$ reduction) toward the edge of the observing range with respect to that of the maximum at the center. Figure A2B displays how the single-slit diffraction pattern varies as the slit-width increases. The slightly curved line atop the others is the duplication of the one in Figure A2A that is associated with a slit-width of 1 μm . The other curves correspond to the diffraction patterns associated with slit widths of respectively 10 μm , 20 μm , and 100 μm , at the order of reduced width of the center lobe.

The spatial intensity distribution of a single-slit is equivalent to a line source convolved with a rectangular function characterizing the slit-width. The diffraction pattern of a single-slit is therefore the irradiation pattern of a line source multiplied with the Fourier transform of the rectangular function representing the slit width which is a sinc-function. The resulted diffraction pattern of single-slit, the intensity profile registered along the X dimension or along a direction orthogonal to the line opening of the slit, thus carries an envelope as shown in Figure A2B that is slightly modified over the square of a sinc-function (the slight modification is due to the slightly varying distance of the field point on the observing plane to the slit center) as is characterized by the lobes separated by the regularly spaced zero-reaching minima. The zero-reaching minima on each later side of the center point occur at lateral positions that are spaced at a constant interval of $\lambda_0 \frac{l}{2b}$.

With the rest of the slit parameters fixed, the spacing between the minima is scaled inversely over the slit width. The center lobe for the 20 μm is 1/2 the width of the 10 μm slit. And the first zero position of the 100 μm slit is 10 times smaller than that of the 10 μm slit.

Appendix B. Fringe Pattern Simulated for a Symmetric Double-Slit with Various Slit Widths and Slit Separations

We then establish computer simulation based on the Huygens–Fresnel principle in producing the mundane interference fringe pattern of a symmetric double-slit and the salient features of double-slit in relating to single-slit pattern. The geometry of a symmetric baseline of the double-slit used to further validate the computer simulation approach is referred to in Figure 1.

Appendix B1. Effect of the slit separation on the interference fringe of a symmetric double-slit at a fixed infinitely thin slit-width. The interference fringe of the symmetric baseline of the double-slit referred to in Figure 1 is assessed for the dependence on the slip separation at the infinitely narrow slit-width. The results are shown in Figure A3 for three values of the slit separation, 1 μm (the thin blue line that is slightly curved), 10 μm (the thick black line that has approximately 2.5 cycles in the field of view), and 186 μm (the thin red line that is much denser in oscillation than the other two profiles). The infinitely narrow slit-width would make the double-slit interference fringe free of the effect of the slit-opening and thereby represent only the spatial frequency characteristics due to separation of the two slits. The fringe makes a 2π phase change over a

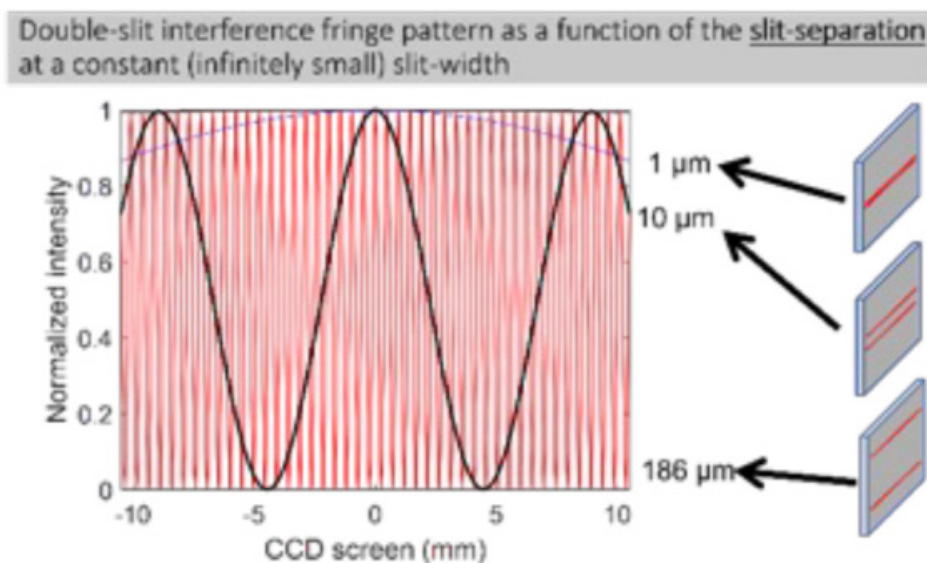


Figure A3. Illustration of how the slit-separation of a double-slit affects the interference fringe. The slit-width is set as infinitely thin. The three curves correspond to three values of slit separation, 1 μm , 10 μm , and 186 μm , respectively.

lateral distance of $\lambda_0 \frac{l}{w}$. As the slit separation w increases, the spatial distance for the fringe to make a 2π phase change becomes smaller, causing a denser cycle or higher spatial frequency of the light intensity distribution on the observing plane.

Appendix B2. Effect of the slit-width on the interference fringe pattern of a symmetric double-slit at a fixed slit separation. The interference fringe of the symmetric baseline of the double-slit referred to in Figure 1 is assessed for the dependence on the slit-width at a constant slit-separation of $186 \mu\text{m}$. The results are given in Figure A4 at four values of the slit width, $0 \mu\text{m}$ (the thin red cycles barely seen at both of the upper corners), $1 \mu\text{m}$ (the thin black cycles whose amplitude is tapered slightly at both of the upper corners), $5 \mu\text{m}$ (the thicker green cycles whose amplitude is tapered significantly toward both lateral aspects), and $10 \mu\text{m}$ (the thickest blue cycles whose amplitude is tapered with a trough appearing toward both lateral aspects). The line of $0 \mu\text{m}$ slit-width at this fixed slit-separation of $186 \mu\text{m}$ in Figure A4 is identical to the line of $186 \mu\text{m}$ slit-separation with the slit-width being infinitely thin as in Figure A3.

As is indicated by Figure A4, keeping the slit-separation constant keeps the spatial frequency representing the cycling of the fringe pattern unchanged, thereby any change to the fringe pattern will represent the effect of the slit-width. By referring to Figure A2 for the effect of the slit-width, one can see that increasing the slit-width will make narrower the envelope modulating the cycling representing the constant spatial frequency of the separation

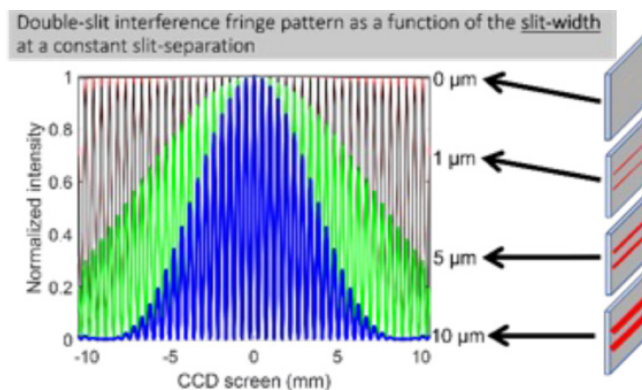


Figure A4. Illustration of how the slit-width of a double-slit affects the interference fringe. The slit-separation is set at a constant value of $186 \mu\text{m}$. The four traces correspond to four values of slit-width, $0 \mu\text{m}$, $1 \mu\text{m}$, $5 \mu\text{m}$, and $10 \mu\text{m}$, respectively.

between the two slits.

The combined effect of a finite width of the slit and the slit-separation of a symmetric double-slit on forming the fringe pattern at the observational plane is illustrated in Figure A5 for the specific configuration of a slit-width of $10 \mu\text{m}$ and a slit separation of $186 \mu\text{m}$. As shown in Figure A5A, the dense cycle represents the spatial frequency of double-slit that is proportional to the inversion of the center-to-center distance between the two slits, and the dashed line with a bell-shaped lobe corresponds to the spatial intensity distribution determined by the width of single-slit. The multiplication of the two types of patterns leads to the one in Figure A5B, a fast cycle with the ampli-

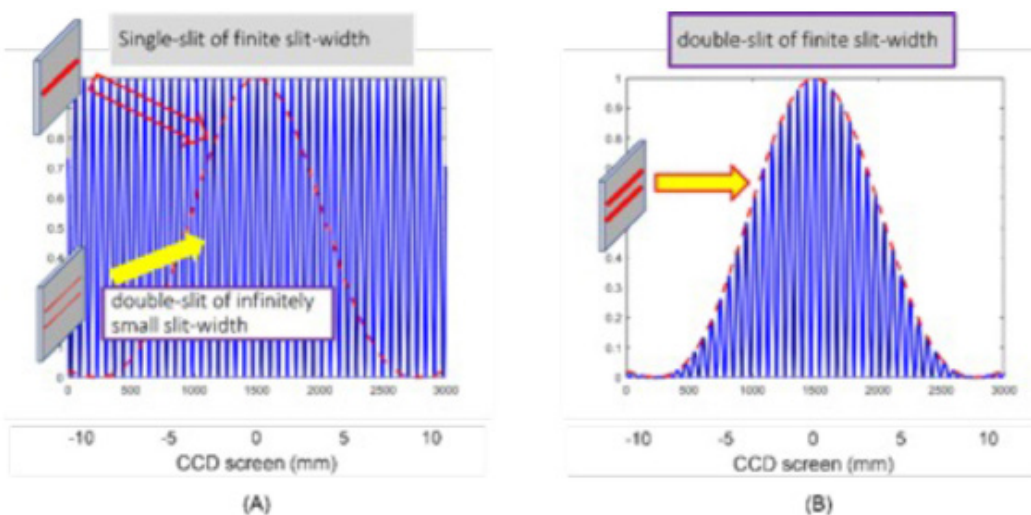


Figure A5. The interference fringe of a double-slit of finite slit-width is the enveloping of the amplitude of an oscillation by the spatial pattern of diffraction determined by the width of the single-slit. **(A)** The high-frequency blue trace of iso-amplitude is characteristic of the spatial separation of the two slits. The dashed red line corresponds to the single-slit diffraction. **(B)** The double-slit interference fringe is the outcome of the slit-separation mandated oscillation modulated in amplitude by the single-slit determined diffraction pattern.

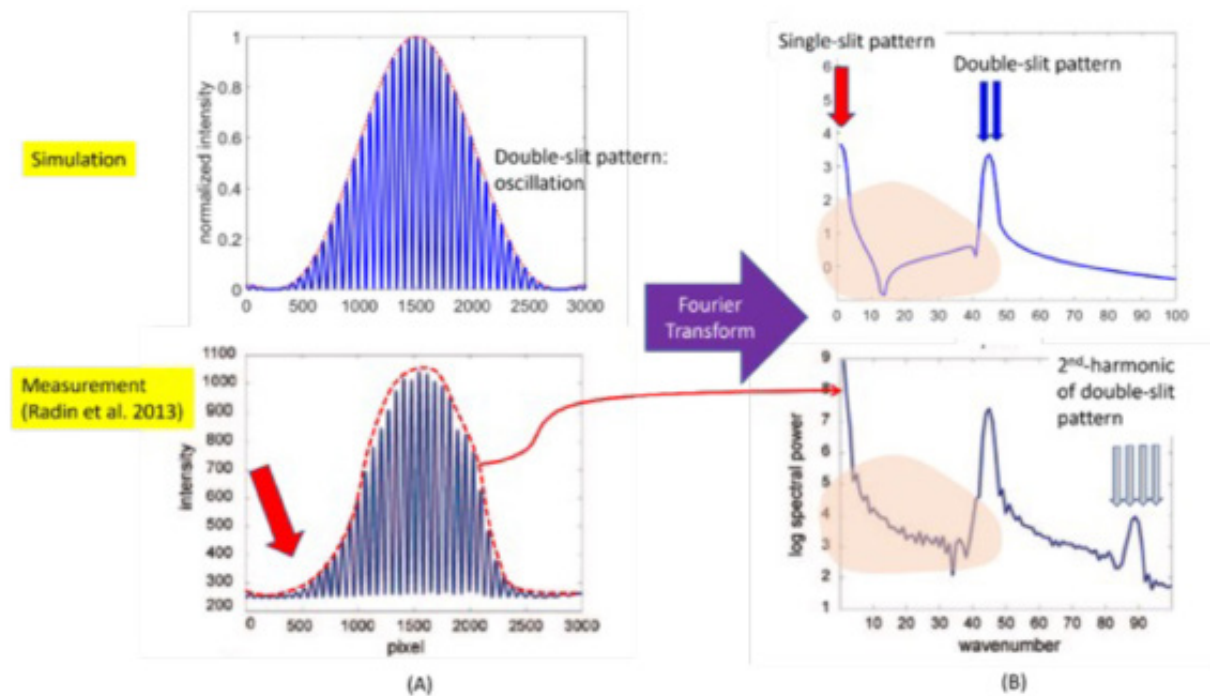


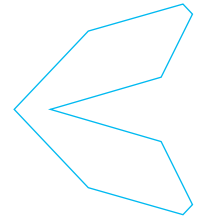
Figure A6. Upper panel: Computer simulation of the interference fringe pattern of a symmetric double-slit, identical to that in Figure A5B. The fringe pattern with the envelope marked with a dashed red line is in the left column and the Fourier transform of the fringe pattern is in the right column. **Lower panel:** experimental interference fringe pattern of the double-slit of Radin et al. The envelope marked with a dashed line is asymmetric, which was caused by a slight misalignment of the slit-center versus the center of the photo-electronic array, according to Radin et al.

tude enveloped by a slow symmetric function of the square of the sinc-function as the double-slit fringe.

Appendix B3. Comparing the computer-simulated fringe pattern of the symmetric double-slit and its Fourier transform against the experimental results of Radin et al. The validity of computer simulation approaches the symmetric baseline of the double-slit referred to in Figure 1 that has the same primary physical parameters as that of Radin et al. can be appreciated by comparing the simulated fringe against the experimental recording of Radin et al. Figure A6 presents both the double-slit fringe pattern and its Fourier transform in reference to the respective experimental results of Radin et al. (reprinted with permission). The upper panel contains computer simulation results, and the lower panel corresponds to experimental results. The fringe patterns are compared on column (A) between computer simulation and experimental registration. The power spectra are compared in (B) between the Fourier transform of computer simulated fringe pattern and the Fourier transform of the experimental data as reported by Radin et al.

We note that the simulated fringe pattern grossly matches that of experimental registration in terms of the shape of the envelope and the oscillation frequency. The match of the computer simulation with the experimental registration of the fringe pattern can be further appreciated by comparing their respective Fourier transformations shown in the right column of Figure A6. The Fourier

transform of the simulated fringe has a DC-bounding peak pointed to by the single framed red arrow, and another peak to the right that is pointed to by the two framed blue arrows. These two peaks align with the corresponding peaks of the Fourier Transform of the experimental fringe which has another peak of higher frequency but lower power as was pointed to by the four framed grey arrows. As was specified by Radin et al., the peak marked by the two framed blue arrows represents the oscillation caused by the separation of the two slits and therefore the double-slit power. The DC-bounding peak marked by the single framed red arrow corresponds to the width of the slit and thereby the single-slit power. The experimentally registered fringe becomes slightly asymmetric, causing the 2nd harmonic of the double-slit pattern to show up in the Fourier transform. The asymmetric distortion of the experimental fringe was also found by Radin et al. to indicate a slight misalignment between the double-slit and the photo-detector array as well as a slightly unequal width between the two slits. These non-ideal conditions and a baseline noise level of the photo-detection might also have caused the elevation of the shoulder of the single-slit power in the Fourier transform of the experimental data. Comparatively, in the computer simulation to which no baseline noise was added and where the double-slit has been ideally symmetric and aligned, the Fourier transform shows clean profiles of a double-slit power and a single-slit power.



**RESEARCH
ARTICLE**

Evaluating the Mystery of 'Brushy Bill' Roberts (aka Billy the Kid) as a Case of Extreme Celebrity Worship

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HIGHLIGHTS

A man who claimed to be 'Billy the Kid' showed behaviors consistent with strong celebrity worship of the famous outlaw, thereby implying that an alter ego persona was possibly at play.

ABSTRACT

'Brushy Bill' Roberts gained notoriety in 1950 for identifying himself as the presumably deceased outlaw 'Billy the Kid.' We hypothesized that his case reflected extreme celebrity worship, which involves psychological absorption with a target celebrity and potential fantasy–reality breakdowns. A blinded expert panel mapped Roberts' claims, activities, and circumstances against the three phases of celebrity worship and their known correlates. Outcomes from this exercise suggested that (a) his reported attitudes and behaviors equated to an above-average score on the Celebrity Worship Scale (McCutcheon et al., 2002), (b) his identity as the Kid unfolded somewhat similarly to the behavioral progression of celebrity worship, and (c) he ostensibly had the most psychosocial risk factors for the 'Entertainment–Social' level of celebrity worship, though many were also noted for the more extreme 'Intense–Personal' and 'Borderline Pathological' phases. These results imply that Roberts might have intentionally adopted Billy the Kid as an alter ego primarily for leisure and escapism, although this construction perhaps evolved to include more compulsory or addictive aspects.

KEYWORDS

Absorption, alter ego, celebrity worship, grandiose delusions, narrative reality

INTRODUCTION

Self and identity anomalies can be a dramatic topic that captures the public's interest and imagination. For instance, supposedly true stories like *Sybil* (Schreiber, 1973) and *The Three Faces of Eve* (Thigpen & Cleckley, 1957/1992) famously publicized the concept of dissociative identity disorder, previously known as multiple personality disorder or 'split personality,' i.e., a mental condition characterized by the maintenance of at least two distinct and relatively enduring personality states (Brand et al., 2016; Dorahy et al., 2014; McAllister, 2000). Other times news reports and television documentaries have highlighted 'identity' mysteries, including the Shakespeare authorship question

(Leigh et al., 2019), the 'Jack the Ripper' serial killer (Louhe-lainen & Miller, 2020), the 17th century French prisoner known as the 'man in the iron mask' (Wilkinson, 2001), and suspected conspirators in the JFK assassination (Linsker et al., 2005). And then there are forensic cases that possibly involve blurred fantasy–reality distinctions, such as individuals who surface under curious circumstances and are believed by some to be various historical figures previously presumed dead. This includes the Grand Duchess Anastasia Nikolaevna of Russia (Kurth, 1983), the mysterious 1971 skyjacker known as 'D. B. Cooper' (Colbert & Szollosi, 2016), Butch Cassidy and Sundance Kid (McPhee, 1998, p. 358), or the three famous escapees from the 1962 prison break from Alcatraz Federal Penitentiary (Noyes, 2016).

A notable example of these latter occurrences—which received national publicity from an *Unsolved Mysteries* television episode (March 1, 1989) and the American Western film *Young Guns II* (1990) concerns the legendary outlaw Henry McCarty, who used the alias ‘William H. Bonney’ but came to be known as ‘Billy the Kid’ or simply ‘the Kid.’ History records that McCarty was shot and killed at the Pete Maxwell home in Fort Sumner by New Mexico Sheriff Pat Garrett on the evening of July 14, 1881 (Garrett, 1882/1954; Rasch, 1995; Utley, 1989; Wallis, 2007). However, a man known as Oliver (Ollie) ‘Brushy Bill’ Roberts appeared rather surreptitiously almost seventy years later claiming to be the Kid incognito. He asserted that Garrett had instead slain a ‘gunslinger’ named Billy Barlow whose body was presented as the Kid (Sonnichsen & Morrison, 1955/2015).

This tale begins in 1948 when probate investigator William V. Morrison was researching an individual named Joe Hines for an inheritance case. This man was a survivor of the ‘Lincoln County War,’ which was the feud that helped to popularize Billy the Kid. Hines reportedly told him that the Kid was still alive but refused to reveal his assumed name or exactly where he was living (Jameson, 2005/2008). In a continued search, Morrison located another man named Frank J. Dalton, who himself claimed to be the notorious bank and train robber Jesse James. Dalton said that the Kid was now known as ‘O. L. Roberts’ and living in Hamilton County, Texas (Walker, 1998). Morrison tracked down Roberts, who eventually ‘confessed’ to being the Kid. Moreover, Roberts’ supporting information and putative evidence apparently so intrigued or impressed Morrison that he became convinced the claim was true.

These events were the genesis of a heated controversy that continues to this day and with interesting points and discrepancies on both sides of the argument (see e.g., Cooper, 2020; Edwards, 2014). Brushy Bill was not unique; however, as at least one other person claimed at a point to be the Kid (Cooper, 2010, 2019). Such reports are occasionally shown to involve imposters or are otherwise settled via DNA testing (Coble et al., 2009; Massie, 1995; Louhelainen & Miller, 2020). However, the latter option is not possible in the present circumstance, since there is no confirmation as to where the remains of the Kid or his mother, Catherine Antrim, are located. Efforts to exhume any such remains have also been legally blocked (Boyle, 2003; Cooper, 2020). That said, other analytical approaches can be applied to certain types of evidence assuming they exist and are available in this case. For example, there have been two separate photographic comparison studies (in 1989 and 1990) between the Kid and Brushy Bill. Neither effort was apparently peer-reviewed, used similar methodologies, nor produced comparable results (cf. Jameson, 2005/2008).

On the other hand, there are techniques in forensic linguistics that purportedly appraise the internal veracity of claimants’ accounts (e.g., Chaski, 2013; Kang & Lee, 2014; Kohnken, 2004). Other procedures, like Interpretive Phenomenological Analysis (e.g., Drinkwater et al., 2013; Simmonds-Moore, 2016) and Conversation Analysis (Wooffitt, 1992; Murray & Wooffitt, 2010), take a qualitative, phenomenological approach combining hermeneutics and idiography to understand how people construct meaning from their experiences and likewise how experiences affect the individuals. These methods can be especially relevant given the way that witnesses to controversial events may ‘mould’ their accounts in the face of overt skepticism (Ohashi et al., 2013). To our knowledge, there is unfortunately no affidavit and only very limited free-response narratives from Brushy Bill that are suitable for such text-based appraisals (cf. Sonnichsen & Morrison, 1955/2015).

However, one option that might help to clarify the present case is a content analysis of Roberts’ claims and activities relative to the known and nuanced patterns of attitudes and behaviors that define increasing levels of celebrity worship (McCutcheon et al., 2002). This approach follows from the idea that he exemplified an extreme case of celebrity worship focused on Billy the Kid. Indeed, studies indicate that high levels of celebrity worship involve fans whose personal identities blend with those of their target celebrities (McCutcheon et al., 2004a), i.e., a fan overly empathizes with (or becomes ‘possessed’ by) the persona of a favorite celebrity and may even begin to dress and act like the target person, even sometimes changing their physical appearance to resemble that celebrity’s likeness. Therefore, systematically mapping Roberts’ statements, behaviors, and psychosocial variables against the phenomenology of celebrity worship might reveal whether or not this hypothesis is a viable explanation for this historical and psychological mystery. To clarify, this study was grounded in the working assumptions that Brushy Bill Roberts was not Billy the Kid but rather that his claims reflected extreme celebrity worship for the outlaw.

THE NARRATIVE OF BRUSHY BILL ROBERTS

This fascinating case involves an array of different, and sometimes confusing or conflicting, information, in contrast to an established collection of well-documented facts and records. Thus, the available and pertinent details arguably constitute a malleable ‘narrative reality’ versus an unequivocal historical account (for a general discussion of this issue, see de Rivera & Sarbin (1998). This situation can frustrate and confound amateur and professional researchers alike, as narratologists note that “simplicity

pleases the mind" (Hoffman, 2014, p. 250). Acknowledging this confound and context, we consulted several commercial books and online resources devoted to Roberts to summarize some of the generally accepted information in this story.

Brushy Bill Roberts [August 26, 1879, to December 27, 1950 (cf. Haws, 2015a, 2015b; Pittmon, 1987); claimed date of birth December 31, 1859] was also apparently known as William Henry Roberts, Ollie Partridge William Roberts, Ollie N. Roberts, and Ollie L. Roberts. He attracted media attention by (a) claiming to be Billy the Kid (implying that Pat Garrett killed the wrong man), and (b) with the assistance of William Morrison, seeking a formal pardon that was supposedly owed to him per an 1879 agreement with territorial governor Lew Wallace. Specifically, the Kid was allegedly offered a pardon in exchange for his grand jury testimony related to a killing he had witnessed during the Lincoln County War (for a discussion, see Cooper, 2018).

Despite affidavits from some acquaintances of the Kid who supported Roberts' claims (see e.g., Edwards, 2014, pp. 197–208; Sonnichsen & Morrison, 1955/2015, pp. 159–171), the pardon application was denied by New Mexico Governor Thomas Mabry in 1950 during a staged press event. It seems that the rejection came, in part, from Roberts' reportedly poor performance at the event, such as his inability to answer basic questions about Billy the Kid and not demonstrating advanced fluency in Spanish. However, advocates insisted that Roberts was impaired in his responses due to a minor stroke that he suffered around the time of the proceedings. Roberts died of natural causes soon after, and the nature of his association to Billy the Kid has been vigorously contested ever since. Brushy Bill's story continues to be promoted in various books, websites, online discussion groups, as well as at the 'Billy the Kid Museum' in Hico, Texas.

There are many intriguing nuances and plot twists in longer versions of this story, which are readily available to interested readers. Our Methods section provides a recommended list from our scoping review. We should note that, irrespective of Brushy Bill's claims, some authors (e.g., Jameson, 2007; for a counterpoint, see Stahl, 2018) have noted the seemingly unusual, if not suspicious, circumstances related to Pat Garrett's (1882/1954) version of the shooting of Billy the Kid and the ensuing inquest and burial. Thus, it could be possible, even if improbable, that Garrett did indeed kill the wrong person, knowingly or unwittingly. Indeed, the assertion that Pat Garrett misconstrued the event is not without some precedent. For a generation after Garrett reportedly shot the Kid, his 1882 account was considered to be factual (Tuska, 1983), but historians have since found his book to have many embellishments and inconsistencies with other accounts of the life of Henry McCarty.

DIAGNOSTIC POTENTIAL OF THE RASCH MODEL FOR CELEBRITY WORSHIP

'Celebrity worship' refers to a particular type of parasocial relationship, i.e., a one-sided connection in which one party (the 'fan') knows a great deal about the other (the 'celebrity'), but the latter does not know the first" (Lange et al., 2011, p. 117; for a recent review, see Zsila & Demetrovics, 2020). This topic has become a burgeoning research area partly due to McCutcheon et al.'s (2002) psychometric work on the construct. This early research included the design and validation of the 17-item, Rasch-scaled Celebrity Worship Scale (CWS), with a mean of 50 and standard deviation of 10. Most empirical studies forgo the original CWS in favor of a later modified, 23-item version of the measure retitled the Celebrity Attitude Scale (CAS: Maltby et al., 2002; cf. Maltby et al., 2006). The CAS is more popular with researchers for its easy scoring system grounded in Classical Test Theory and clean delineations among the three intensity-levels of celebrity worship: (a) Entertainment–Social, (b) Intense–Personal, and (c) Borderline Pathological phases, respectively.

However, the original CWS was more than an interval-level and validated measure for survey studies. It empirically defined the phenomenology of celebrity worship in terms of a Rasch (1960/1980) scale, which denotes a specific and robust hierarchical sequence of discrete yet additive attitudes and behaviors (see Table 1; cf. McCutcheon et al., 2002, p. 75). Specifically, the lowest levels of celebrity worship are characterized by solitary behaviors that can be interpreted as reflecting sensation-seeking and entertainment ("Keeping up with news about my favorite celebrity is an entertaining pastime"), yet these behaviors take on a social component at higher levels ("I love to talk to others who admire my favorite celebrity"). Interestingly, the most extreme Rasch levels of celebrity worship revert back to the private sphere, but this worship now has obvious obsessive-compulsive features ("I have frequent thoughts about my favorite celebrity even when I don't want to" and "I often feel compelled to learn the personal habits of my favorite celebrity").

McCutcheon et al. (2002, pp. 81–82) accounted for this behavioral hierarchy with an 'Absorption-Addiction Model' (for a detailed discussion, see Lange et al., 2011, pp. 121–124). Particularly, they hypothesized that a compromised identity structure in some individuals (e.g., introverted nature or lack of meaningful relationships) facilitates psychological absorption with a celebrity in an attempt to establish an identity or a sense of fulfillment. The dynamics of the motivational forces driving this absorption, can, in turn, take on an addictive component that leads to more extreme and perhaps delusional-like attitudes and behav-

TABLE 1. Literature Set Used for the Content Analysis of the ‘Brush Bill Roberts’ Narrative

	Source	Connection to BB	Type
1.	Cooper (2020)	Independent researcher	Book
2.	Edwards (2014)	Independent researcher	Book
3.	Hall (2004)	Independent researcher	
4.	Haws (2015a)	Family member	Book
5.	Haws (2015b)	Family member	Book
6.	Hefner (1986/1996)	Independent researcher	Book
7.	Hefner (1991)	Independent researcher	Book
8.	Jameson (2005/2008)	Independent researcher	Book
9.	Jameson (2017)	Independent researcher	Book
10.	Jameson (2018)	Independent researcher	Book
11.	Jameson and Bean (1998)	Independent researcher	Book
12.	Sonnichsen and Morrison (1955/2015)	Personal attorney	
13.	Tucker (2017)	Independent researcher	Book
14.	Tunstill (1988)	Independent researcher	Book
15.	Valdez and Hefner (1995)	Independent researcher	Book
16.	https://www.amarillopioneer.com/blog/2018/3/16/rossers-ramblings-brushy-bill-roberts-aka-billy-the-kid	Independent researcher	Website
17.	http://www.angelfire.com/mi2/billythekid/brushy.html	Independent researcher	Website
18.	http://www.angelfire.com/nm/boybanditking/pageBrushy.html	Independent researcher	Website
19.	https://unsolvedmysteries.fandom.com/wiki/Brushy_Bill_Roberts	Independent researcher	Website
20.	https://unsolvedmysteries.fandom.com/wiki/Brushy_Bill_Roberts_Timeline	Independent researcher	Website
21.	https://wiki2.org/en/Brushy_Bill_Roberts	Independent researcher	Website
22.	https://en.wikipedia.org/wiki/Brushy_Bill_Roberts	Independent researcher	Website

iors needed to sustain an individual’s satisfaction with the parasocial relationship. The findings of several studies are consistent with the tenets of this model (e.g., Houran et al., 2005; Maltby et al., 2002; Maltby et al., 2001).

Furthermore, research has specified certain risk factors that seemingly influence an individual’s progression in the Rasch hierarchy which underlies the model. In fact, each of the hypothesized phases or intensity levels of celebrity worship shows some consistent and distinct correlates with various perceptual-personality variables and cognitive-emotional states (for a summary, see Lange et al., 2011, Table 7.2, p. 126). These collective patterns can potentially serve diagnostic purposes. As applied to a suspected case of extreme celebrity worship, for example, the trends noted above provide a template of standardized clues with which to evaluate an individual’s attitudes, behaviors, and ostensible risk factors. Therefore, the CWS and its correlates essentially offer evidence-based screening criteria to infer the presence and intensity of celebrity worship.

THE PRESENT STUDY

This paper describes a quali-quantitative analysis of the claims and activities of Brushy Bill Roberts, as derived from archival records, methodically compared to McCutcheon et al.’s (2002) Rasch model of celebrity worship and its known correlates. To study qualitative data scientifically, content (or thematic) analysis is often used to simplify complex text-based information into quantifiable data suitable for standardized comparisons or statistical analyses (Namey et al., 2008; Ryan & Bernard, 2000). More specifically, content analysis involves assigning a series of unique labels to sentences of a larger text that reference a particular thematic category of information that maps the “distinct phenomena into descriptive categories” (Krippendorff, 2013, p. 275).

Different techniques are available for such analyses, but we selected a Content Category Dictionary (CCD) approach. CCD is used to retest existing categories, concepts, or models in new contexts (Catanzaro, 1988). Previous stu-

dies have shown this to be an effective method when analyzing reports of unusual or anomalous experiences (e.g., Houran, 2013; O’Keeffe et al., 2019; Laythe, et al., 2021). We designed and implemented a two-tier, deductive protocol using a categorization matrix based on the original CWS measure and empirical literature on its known correlates. In this way, our procedure enabled records related to Brushy Bill to be mapped by experimentally blinded coders and then compared against three general hypotheses. If confirmed, these would cumulatively point to a likely case of extreme celebrity worship:

Hypothesis 1: Roberts’ reported attitudes and behaviors will correspond to a score >50 on the Rasch-based CWS measure, indicating an above-average (and possibly a clinically relevant) level of celebrity worship linked to Billy the Kid.

Hypothesis 2: Roberts’ sequence of reported attitudes and behaviors will align to the hierarchy of the Rasch-based CWS measure.

Hypothesis 3: Roberts’ psychosocial history will contain risk factors consistent with known correlates of higher levels of celebrity worship.

MATERIALS AND METHODS

Literature Set

Data derived primarily from archival records such as first-hand accounts, biographic material, news reports, or commercial treatises that we identified via a scoping review of relevant literature. This was done by first consulting four key sources of literature: (a) Google search of the first twenty entries using the terms “Brushy Bill Roberts claims to be Billy the Kid” ($n = 20$), (b) Google scholar search with the terms “Brushy Bill Roberts and Billy the Kid” ($n = 144$), (c) Reference list for the Wikipedia entry on “Brushy Bill Roberts” ($n = 24$)¹, and (d) Amazon.com book search with the terms “Brushy Bill Roberts and Billy the Kid” ($n = 15$). We conducted our searches with these four digital databases on the same date (14 July 2020). Second, a qualitative inspection of this literature set ($n = 203$) screened out (a) overlapping references, (b) earlier versions of texts that were later updated, and (c) references that did not address Roberts’ claims or activities. These selection criteria yielded a final collection of 22 records (including both primary and secondary sources) for content analysis, comprising 15 books and 7 websites (see Table 1).

Procedure

CCD Coding. We designed and implemented a two-tier, deductive protocol using a categorization matrix based on the original Rasch-based CWS (McCutcheon et

al., 2002), which uses a 5-point Likert scale (5 = ‘strongly agree’, 3 = ‘uncertain or neutral’, and 1 = ‘strongly disagree’) and shows excellent psychometric properties and acceptable reliability (the local Rasch reliabilities for the items range from .71 to .96). Note that the CWS has nuances with both computing raw scores and subsequently converting these to Rasch scaled scores. Specifically, before adding, the ‘1 to 5’ Likert ratings for Items 5, 13, 17, 19, 23, 29, and 31 are recoded as ‘0, 1, 1, 2, and 3’, respectively. The ratings of Items 3, 6, 9, 12, 14, 15, 16, 18, 21, and 24 are recoded as ‘0, 1, 1, 2, and 2.’ The panel initially rated items a ‘4’ when they had at least one mention or example per source, whereas they rated items a ‘5’ when there were at least three mentions or examples per source. The panel rated items a ‘3’ that lacked any reasonably clear support, or a ‘1 or 2’ when multiple mentions or examples clearly specified patterns opposite to the CWS items. These ratings were then averaged across the literature set to produce a ‘final (or aggregate)’ rating for each item before being recoded per the system noted above.

Next, we used a binary approach to code for the putative influence of 27 psychosocial correlates of celebrity worship via a study-specific checklist that extended Lange et al.’s (2011, p. 126) summary with more recent research findings (i.e., Ashe et al., 2005; Chia & Poo, 2009; Green et al., 2014; Maltby & Day, 2017; McCutcheon et al., 2004b, 2015, 2016; North et al., 2007; Reeves et al., 2012; Swami et al., 2011). A score of ‘0’ denoted a risk factor that was ‘Ostensibly Absent,’ whereas a score of ‘1’ indicated that a variable was ‘Ostensibly Present’ as supported by at least one mention or example per source. Note that risk factors can pertain to more than one of the three intensity levels of celebrity worship. We then summed the average ratings of these individual risk factors across the literature set. This produced a total score ranging from 0 to 27, with a higher value indicating more risk factors for a potential case of celebrity worship to intensify. Thematic classifications were done by two experimentally blind reviewers who were trained on the coding materials and made judgments collectively as an expert panel to enhance the reliability of the final classifications (see, e.g., Bertens et al., 2013).

RESULTS

Hypothesis 1: Aggregate Patterns in the Brushy Bill Case

Using the scoring system described above, the CCD mapping results summarized in Table 2 translated to a raw score of 29 and a corresponding Rasch scaled score of 63.7 ($SE = 2.1$) on the CWS measure. This result slightly exceeds one standard deviation above the mean and thus suggests the possibility that Brushy Bill experienced, at the very

TABLE 2. Rasch Hierarchy of Items in the Celebrity Worship Scale (McCutcheon et al., 2002, p. 75) Contextualized to the Literature Set for “Brushy Bill” Roberts (BB)

Celebrity Worship Scale Item	Average Rating by Expert Panel (1 = Strongly Disagree; 3 = Neutral; 5 = Strongly Agree)	Sample Evidence (Table 1 source: page no.)
Did BB enjoy watching, reading, or listening to information about Billy the Kid?	4	1:345
Learning the life story of Billy the Kid was a lot of fun to BB?	3	n/a
Was keeping up with news about Billy the Kid an entertaining pastime for BB?	3	n/a
Did BB love to talk with others who admired Billy the Kid?	5	1:380
Did BB like watching and hearing about Billy the Kid when in a large group of people?	3	n/a
Did BB find it enjoyable just to be with others who liked Billy the Kid?	4	12:92
Did BB and his friends like to discuss what Billy the Kid had done?	4	1:382
Did BB feel compelled to learn what other people claimed were the personal habits of Billy the Kid?	4	3:149
For BB, was ‘following’ Billy the Kid like daydreaming because it took him away from life’s hassles?	3	n/a
Did BB have pictures and/or souvenirs related to Billy the Kid that he always keep in exactly the same place?	4	8:95
Did BB feel that the successes of Billy the Kid were his successes also?	4	12:50
When something bad happened to Billy the Kid, did BB feel like it happened to him?	4	12:96
Did BB have frequent thoughts about Billy the Kid, even when he didn’t want to?	3	n/a
When people talked about Billy the Kid dying, did BB feel (or felt) like he was dying too?	3	n/a
Did BB feel that the failures of Billy the Kid were his failures also?	4	3:22
When discussing something good that happened to Billy the Kid, did BB simultaneously feel like it happened to him?	4	12:50
Did BB seem obsessed by details of Billy the Kid’s life?	5	14:52

least, an Intense–Personal level of celebrity worship for Billy the Kid (cf. McCutcheon et al., 2002, pp. 74–76). This level is characterized by high psychological absorption versus addiction according to the Absorption-Addiction Model of celebrity worship. To clarify, absorption is “a disposition for having episodes of ‘total’ attention that fully engage one’s representational (i.e., perceptual, enactive, imaginative, and ideational) resources” (Tellegen & Atkinson, 1974, p. 268). Simply put, this entails the cognitive capacity for involvement in sensory and imaginative experiences in ways that alter a person’s perception, memory, and mood with behavioral and biological consequences. Moreover, people often seek states of absorption as a form of escape or distraction (e.g., Dixit et al., 2020; Jameson et al., 2011; Lange et al., 2022).

Hypothesis 2: Brushy Bill’s Chronology Compared to the Celebrity Worship Scale

McCutcheon et al.’s (2002) Rasch model of celebrity worship indicates that fans progress along a structured continuum, whereby benign attitudes and behaviors precede increasingly stronger or extreme attitudes and behaviors. This general pattern specifically involves the chain of ‘solitary behaviors → group behaviors → solitary behaviors.’ Unfortunately, to our knowledge there is no indisputable and comprehensive chronology of Roberts’ attitudes, claims, and behaviors concerning Billy the Kid. Thus, we could not rigorously test Hypothesis 2 as planned. But the available literature distinctly implies that Roberts talked about his identity as Billy the Kid to select people prior to

him speaking to William Morrison and subsequent others more widely. It also appears that Roberts began to back-track or deflect somewhat the more that his claims were publicized and scrutinized. Our observation, if correct, could have several explanations, so we draw no firm conclusions. However, this apparent behavior of “beginning privately, becoming more public, and then retreating to oneself” could be construed as generally consistent with the Rasch pattern above. But in the end we cannot confidently affirm this hypothesis due to vague or incomplete information.

Hypothesis 3: Brushy Bill’s Psychosocial Pressures for Celebrity Worship

Assessing the potential presence of risk factors for celebrity worship in Roberts serves as a valuable cross-check of Hypothesis 1. That is, a given fan should theoretically exhibit certain tangential attitudes and behaviors that coincide with his/her apparent intensity level of celebrity worship. Important deviations from these known patterns, in contrast, could be construed as evidence against a particular intensity level of celebrity worship. For example, identifying a majority of known correlates to the ‘Intense–Personal’ level of celebrity worship would arguably corroborate the conclusion from Hypothesis 1, whereas finding a majority of known correlates only to the ‘Entertainment–Social’ or ‘Borderline Pathological’ levels would presumably undermine that conclusion.

Using the scoring system described earlier, the mapping results summarized in Table 3 produced a final score of 16.4, which noticeably exceeds the median score (i.e., 13.5) on our checklist of psychosocial correlates of celebrity worship. Note that while the panel identified reasonable indications of risk factors spanning the three intensity levels of celebrity worship, most of these specifically coincided with the ‘Entertainment–Social’ phase (71% of the risk factors present), whereas the expert panel identified 44% of the ‘Intense–Personal’ risk factors and 47% of the ‘Borderline Pathological’ risk factors, which are the more extreme phases of celebrity worship, respectively, in McCutcheon et al.’s (2002) Absorption-Addiction Model. These trends generally agree with Hypothesis 3, albeit we would have expected a more distinctive pattern of ‘Intense–Personal’ risk factors outnumbering those for the ‘Borderline Pathological’ phase. Still these results imply that Roberts’ focus on Billy the Kid was predominantly rooted in leisure, escapism, although to a good extent it also involved compulsory thoughts and addictive behaviors. This might mean that Roberts’ putative celebrity worship was in a transitory period from the ‘Intense–Personal’ to ‘Borderline Pathological’ level and could have thus intensified if not for his sudden death.

DISCUSSION

Researchers have long acknowledged the value of case studies (e.g., McWhinney, 2001; Solomon, 2006; Thomas, 2011), which can be explanatory, descriptive, or exploratory. These are defined as the scientific documentation of a single clinical observation and have a time-honored and rich tradition in scientific publication. These reports represent a relevant, timely, and important study design in advancing scientific knowledge especially of rare conditions or phenomena. Advantages of this method include data collection and analysis within the context of a given phenomenon, integration of qualitative and quantitative information in analysis, and the ability to capture complexities of real-life situations so that the phenomenon can be studied in greater detail. Case studies do have certain disadvantages that may include lack of rigor, challenges associated with data analysis, and little basis for generalizations of findings and conclusions (for a discussion, see Hyett et al., 2014).

Likewise, our study of Brushy Bill Roberts was a retrospective and deductive analysis from the lone and narrow perspective of celebrity worship. The present analysis arguably offers new insights and information, but it cannot definitively resolve the identity or motivations of Brushy Bill Roberts. Indeed, our findings might have differed if the assessments and analyses had been conducted when Roberts was alive and had his full cognitive faculties to participate. More accurate information also would have derived from data collected via a time series format that included the periods prior to and during the wide publicization of the case circa 1950. In fact, we had originally intended to include information from structured interviews of individuals (e.g., family members or historians) with in-depth knowledge of Roberts’ claims and activities. The idea was to seek clues about his personality, mental state, social influences, and private actions immediately prior to and during his 1950 legal pursuits and then compare this information to the outcomes from our content analysis.

We were unable to find contact information for two suitable individuals, and regrettably several people we contacted either did not respond to our interview requests or declined to participate. This apparent lack of interest perplexes us. In one instance, Roy Haws stated that, “I appreciate your request, but there is *absolutely nothing I can add that is not in my book*. I wrote it six years ago, primarily for family reasons since Brushy (Oliver Pleasant Roberts) was my half great grand-uncle (my maternal great grandmother’s half-brother)” (personal communication to S. M. Houran, July 27, 2020, emphasis added). The assertion here is that an interview would have only garnered information that was superfluous or duplicative to his published mate-

TABLE 3. Psychosocial Risk Factors of the Three Intensity Levels of Celebrity Worship (Expanded from Lange et al., 2011, p. 126) Assessed in the Literature Set for the 'Brushy Bill' Case

Variable	Indicators May Include but Are Not Limited to . . .	Average Rating by Expert Panel (0 = not evident, 1 = ostensibly evident)	Sample Evidence (Table 1 source: page no.)
Entertainment-Social (low intensity)			
Eysenckian Extraversion (sociable, lively, active, venturesome)	Seeks out and enjoys the company of others, enthusiastic, talkative, assertive, gregarious, friendly, cheerful, seeks excitement, high activity levels.	1	1:176
Quest for Religiosity (among men)	Spiritual journeying, seeks religion as a quest for the truth, asks questions about spirituality, has doubts about spirituality.	0	9:160
Depression	Sad, low, moody, miserable, despondent.	.9	12:21
Tendency to savor experiences	Reminiscing about pleasant events, seeking to extend happy events, maximizes pleasant experiences.	.5	12:50
Reward responsiveness	Seeks rewarding outcomes, will take risks to achieve rewarding outcomes, will accept small rewards over no reward, obtains pleasure thinking about future rewards.	.1	12:23
Thin Childhood / Adolescence / Adult Boundaries	Very close to childhood memories and flexible in plans for one's future.	.8	9:69
Thin Boundaries re: Child-like Ideations	Very close to childhood feelings and appreciation for the sense of joy and wonder that children often have.	.9	12:7
Intense-Personal (medium intensity)			
Eysenckian Neuroticism (tense, emotional, moody)	Frequent mood swings, easily disturbed, worries about things, easily irritated, often feels down.	.9	14:52
Low Extrinsic-Personal Religiosity	Religious beliefs do not offer comfort, religious beliefs don't influence daily life, other things are more important than religion.	0	n/a
Low Extrinsic-Social Religiosity (among men)	Does not go to church to engage with friends, does not base whole life on religion, does not enjoy worshipping with others.	0	n/a
Anxiety	Fearful, nervous, apprehensive, uncertain, irritable, restless, can't sleep well, feels on edge.	.9	8:48
Depression	Sad, low, moody, miserable, despondent.	.9	12:21
Thin Childhood / Adolescence / Adult Boundaries	Very close to childhood memories and flexible in plans for one's future.	.8	9:69
Thin Organizations / Relationships Boundaries	Likes or prefers jobs with diverse duties that are not too strictly defined and believes that being flexible and adaptable is key to getting along with others at work.	.9	5:73
Thick Boundaries re: Personal and Physical Environments	Neither very sensitive to other people's feelings nor to environmental changes, such as loud noises or bright lights.	0	n/a
Reward responsiveness	Seeks rewarding outcomes, will take risks to achieve rewarding outcomes, will accept small rewards over no reward, obtains pleasure thinking about future rewards.	.1	12:23
Low agreeableness	Selfish, argumentative, competitive, individualistic, not helpful, not modest, won't compromise, manipulative.	1	8:49
Low enjoyment of solitude	Needs others, unhappy when alone, gets lonely easily.	1	14:44
Need for uniqueness	Seeks to be distinctive, likes to buy goods to help develop self-image, makes unusual judgements.	1	1:176

TABLE 3 (continued). Psychosocial Risk Factors of the Three Intensity Levels of Celebrity Worship (Expanded from Lange et al., 2011, p. 126) Assessed in the Literature Set for the 'Brushy Bill' Case

Variable	Indicators May Include but Are Not Limited to . . .	Average Rating by Expert Panel (0 = not evident, 1 = ostensibly evident)	Sample Evidence (Table 1 source: page no.)
Poorer cognitive flexibility	Can't easily switch to thinking about different concepts, finds it difficult to focus on more than one thing.	.9	8:49
Materialistic values	Focuses on money, possessions, social standing, image, status.	.9	3:151
Stable and global attributions	Things don't change, there is nothing I can do about it, things are always like this, there's no point in trying as things always end up the same.	.3	12:28
Exploitativeness	Uses people for profit or advantage.	1	3:22
Borderline Pathological (high intensity)			
Eysenckian Psychoticism (impulsive, anti-social, ego-centric)	Prone to taking risks, engages in anti-social behaviours and activities, impulsive, non-conformist.	1	3:89
Poorer cognitive flexibility	Can't easily switch to thinking about different concepts, finds it difficult to focus on more than one thing.	.9	8:49
Poorer creativity	Doesn't generate or recognise new ideas or alternatives, stuck in the mud, can't easily solve problems, can't generate new possibilities well, can't entertain self easily.	.3	8:49
Thin Childhood / Adolescence / Adult Boundaries	Very close to childhood memories and flexible in plans for one's future.	.8	9:69
Thin Boundaries re: Child-like Ideations	Very close to childhood feelings and appreciation for the sense of joy and wonder that children often have.	.9	12:7
Thin Organizations / Relationships Boundaries	Likes or prefers jobs with diverse duties that are not too strictly defined and believes that being flexible and adaptable is key to getting along with others at work.	.9	5:73
Thick Boundaries re: Personal and Physical Environments	Neither very sensitive to other people's feelings nor to environmental changes, such as loud noises or bright lights.	0	n/a
Thick Interpersonal Boundaries	Tendency to be private and cautious with people; does not easily open up.	0	n/a
Need for uniqueness	Seeks to be distinctive, likes to buy goods to help develop self-image, makes unusual judgements.	1	1:176
Greater boredom proneness	Easily bored, easily lonely and sad, can become angry when alone, often finds life monotonous.	.6	3:121
Materialistic values	Focuses on money, possessions, social standing, image, status.	.9	3:151
External, stable, and global attributions	Things are never my fault, things don't change, there is nothing I can do about it, things are always like this, there's no point in trying as things always end up the same.	.3	12:29
Self sufficiency	Secure and content with self, a deep-rooted sense of inner completeness and stability.	.1	3:23
Vanity	Excessive pride in and overestimation of own merits and abilities, assumes others hold them in high regard, arrogant, conceited.	.2	12:11
Compulsive buying	Preoccupation with buying things, poor impulse control at shops.	0	n/a

rial. Haws' standpoint is undoubtedly sincere, but we challenge its premise. None of the sources from our scoping review overtly acknowledged or discussed the idea that Brushy Bill was exhibiting extreme celebrity worship of Billy the Kid. Plus, a good body of empirical literature to support model-building and theory-formation on fan psychology has been largely lacking until fairly recently. Thus, no one seems to have previously explored information and evidence directly pertinent to this hypothesis, much less had written about it. But we must also concede that our failed interview approach was a missed opportunity that might have helped to support or discredit our hypotheses. Overall, we are left to work with imperfect research protocols to assess 'noisy' data.

Nevertheless, our analysis produced some meaningful learnings that help to contextualize this case. Sonnichsen and Morrison (1955/2015) stressed the fundamental issue when they pondered, ". . . if *Brushy Bill Roberts* wasn't *Billy the Kid*, then who was he?" (p. 117). Impartial contemplation suggests three probable answers to this question, namely that the Brushy Bill narrative represents: (a) deliberate hoaxing, (b) pathological delusion, or (c) a non-pathological fantasy construction. Note that these ideas are not necessarily mutually exclusive, but each would need to explain how Roberts somehow had access to detailed (and presumably intimate or obscure) historical information about Henry McCarty. On one hand, having such knowledge aligns perfectly with the notion that Roberts was Billy the Kid. The higher CWS score found here can also be explained by this hypothesis; indeed, over-identification and empathy with a target celebrity essentially equates to the fan 'cloning' the celebrity. Then again, some authors note that Roberts' arcane knowledge about the Kid had been previously published by historians and therefore publicly available to interested parties (see, e.g., Haws, 2015b, pp. 82–83; Jameson & Bean, 1998, pp. 144–149).

In total, the simplest explanation is that Brushy Bill willfully perpetrated, or participated in, a deliberate hoax or fraud. The most common definition of fraud is "to get an advantage over another by false representations" which include "surprise, trickery, cunning and unfair ways by which another is cheated" (Albrecht et al., 2014, p. 7). But an accusation of fraud does not automatically illuminate Roberts' rationale or impulses in this scenario. For instance, Kakati and Goswami (2019) reviewed the motivations for fraud in financial contexts and found consistent support for a PICOIR model defined by the six variables of "pressure, incentive, capabilities, opportunity, integrity, and rationalization" (p. 92). Some persuasive evidence and argument suggest that several of these influences were present in this case (Cooper, 2020; Haws, 2015a, 2015b) and that various individuals might have conspired with Roberts in

a deceit (Cooper, 2020). Nevertheless, other notable motivations(s) could have been at play, including attention- or sensation-seeking behaviors or empathy and advocacy for the Kid. Any comprehensive solution proffered for Robert's identity must account for all aspects of his narrative, so a *generic allegation* of intentional fraud seems unsatisfactory to us at this time.

The rival notion that Brushy Bill was 'delusional' also entails critical nuances or complexities about his general mental health. There are different types and severity of delusions, although a grandiose delusion would be the obvious variety here. These are unfounded beliefs that one has special powers, wealth, status, mission, or identity (Knowles et al., 2011; Picardi et al., 2018; Sheffield et al., 2021) and thus would include cases of individuals who believe they are famous celebrities or historical figures. Grandiose delusions might be part of fantastic hallucinosis, which is a pathological mental state characterized by hallucinations. After persecutory delusions, grandiose delusions are reported to be one of the most common types of delusion in psychosis (Appelbaum et al., 1999) and the most common symptom in bipolar mania (Dunayevich & Keck, 2000; Goodwin & Jamison, 2007; Knowles et al., 2011; Turkington & Kingdon, 1996).

Theoretical discussions about grandiose delusions date back more than 100 years (Bleuler, 1911/1950; Freud, 1911), but they have been surprisingly neglected as a specific focus of research and clinical practice (Knowles et al., 2011). Manschreck (1995) broadly posited that an individual's culture, personal history, and experiences need to be considered when understanding the pathogenesis of delusions, but the dearth of research on grandiose delusions markedly contrasts with the extensive literature on other psychotic experiences such as persecutory delusions and auditory hallucinations. Regardless, we found no clear documentation of hallucinations, psychosis, or bipolar mania mentioned in terms of Roberts' medical history. This does not negate the possibility of a grandiose delusion in this case, but to our knowledge there is no compelling evidence that corroborates this hypothesis.

Finally, Roberts might have acted out a fantasy construction that gradually overshadowed his self and identity, or what might be called his 'personal myth' (Krupelnyska, 2020). This need not involve psychopathology per se and also could happen in ways apart from extreme celebrity worship. For instance, Caputo et al.'s (2021) systematic review of mirror- and eye-gazing phenomena indicated that experiences of derealization, depersonalization, or dissociated identity can be induced even in healthy (non-clinical) individuals under certain environmental conditions, albeit not directly pertinent here. Other researchers have discussed autonomous identities during alienated agency or

creative dissociation. This could include instances of ‘psychic mediumship’ (Cunningham, 2012; Maraldi & Krippner, 2013; Pasi, 2016) or fiction writers who experience their characters as having ‘minds of their own’ (Foxwell et al., 2020; Taylor et al., 2003; Watkins, 1990). Researchers have likewise noted ‘independent agency’ in some accounts of childhood imaginary companions (Laythe et al., 2021; Little et al., 2021; Taylor, 1999). But similar to the issue of psychotic-type delusions above, we found no indications of marked dissociation, much less dissociative identity disorder, aside from Roberts’ esoteric claim of being Billy the Kid. Indeed, research suggests that dissociation-related behavior is associated only with the ‘Borderline Pathological’ phase of celebrity worship (Maltby et al., 2006).

Rather than manifesting a dissociated identity, however, we ponder whether Roberts exhibited a form of escapism, identity diffusion, or self-distancing by knowingly adopting the persona of Billy the Kid as an *alter ego*. Self-distancing involves visualizing events from the perspective of an observer and creating psychological distance from an experience or situation. This can take a simple form, such as thinking about or discussing experiences using ‘third-person’ language (Nook et al., 2017). Embracing a self-distancing perspective generally promotes a big picture view, allowing one to recognize that life events do not always meet personal expectations (Grossmann, 2017; White et al., 2019). There is also some evidence that this perspective can empower individuals. For instance, White and Carlson (2015) found that psychological distancing can have an important influence on the conscious control over both thoughts and actions. Equally, Herman (2019) documented several cases of people who successfully assumed alter egos to enhance their motivation, confidence, or performance, including salespeople, entertainers, athletes, business executives, and historical figures.

The psychology of alter egos seemingly resembles the over-empathy or over-identification intrinsic to higher levels of celebrity worship. That said, famous personalities are not the only targets for character formation in this context. For example, police impersonators (or ‘cop wannabes’) are a well-known, though poorly understood, phenomenon (Rennison & Dodge, 2012). The same can be said for instances of ‘stolen valor’ in which a person falsely represents their military service and specifically having been awarded a military honor (Weisz, 2016). Both behaviors are a form of identity theft that seem to be motivated, in part, by the lure of authority and ego enhancement (Rennison & Dodge, 2012). Yet irrespective of the specific characters that people select as alter egos, we expect that McCutcheon et al.’s (2002) Absorption-Addiction Model can help to explain the process(es) underlying their creation or maintenance. This idea deserves further exploration, as research

along these lines could potentially yield important insights for theory and practice in addressing aberrations or disruptions in people’s sense of self and identity that sometimes apparently coincide with a search for distraction, escapism, or meaning relative to psychosocial stressors (see e.g., Houran et al., 2005; Maltby et al., 2004).

Based on our evaluation of the available information, we propose that Brushy Bill Roberts fundamentally had no less than an ‘Intense–Personal’ level of celebrity worship in which he became psychologically absorbed with Billy the Kid and then consciously adopted him as an alter ego. This idea is more parsimonious to us than dogmatic positions that his story was a pure hoax or delusion. We further presume that this hypothesized shift in Roberts’ self and identity was sincerely experienced and expressed to others without fraudulent intentions. Perhaps the most telling aspect that lends some credence to this interpretation is the fact that Roberts was friends with one or more other individuals who likewise claimed to be important historical figures ‘in hiding.’ To be sure, the small Texas town of Granbury seems to be a hotbed of such claims that include people who purported to be John Wilkes Booth and Jesse James (Herr, 2011; Hightower, 1978; Kirby et al., 2002)—a virtual fan club of devotees that, in our view, strongly suggests that we are dealing with a socially-driven, alter-ego phenomenon in which Roberts was immersed. Of course, it is also possible, and maybe even likely, that certain people actively coached, instructed, or otherwise helped to reinforce or sensationalize his Billy the Kid persona for fame or fortune (see e.g., Cooper, 2020). Overall, we do not think that Roberts’ case is convincingly explained by a single factor or motivation, whether it be hoaxing or celebrity worship.

More broadly, one positive outcome is that this study underscores the paucity of robust research and behavioral models for self and identity anomalies related to grandiose delusions, creative dissociation, and alter-ego personalities. Accordingly, future research should explore the potential interrelationships among these phenomena. This line of research could examine how their corresponding mediators or moderators relate to the ‘Intense–Personal’ and ‘Borderline Pathological’ levels of celebrity worship, which routinely involve strong empathy and over-identification with target personalities. It seems likely that this framework of interactions holds the most prudent answer to the mystery of Brushy Bill above and beyond any charges of deliberate fraud. Furthermore, this view might predict that modern-day fans with higher levels of celebrity worship will likewise exhibit subtle or severe forms of alter-ego behavior or other anomalies in their self and identity that occur apart from the socially accepted forums of fandom conventions or cosplay activities. But even assuming the

validity of our ‘celebrity worship—alter ego’ hypothesis, Roberts’ case remains unsolved to the extent that his reasons for specifically targeting Billy the Kid are unclear.

Our conclusions are tempered by several important limitations. First, modifying the CWS to guide a content analysis of attitudes and behaviors recounted, in part, by third parties could be criticized as an exceedingly speculative or tenuous approach. The counterpoint, of course, is that this was the only option since Roberts’ death prevented direct assessments of salient variables, which is standard practice in celebrity worship studies (Lange et al., 2011). Second, the CCD mapping exercise was perhaps not optimal. Although we used impartial researchers to control for experimenter bias with the ratings (Sheldrake, 1998), it could be argued that Brushy Bill biographers or scholars would have been more appropriate or accurate coders of the literature set. It should be noted, however, that most of these scholars tend to be sharply polarized as either advocates or detractors of Roberts’ claims. Thus, this latter tactic may not have produced results that were any more balanced or accurate than our findings. Still this type of strict or conceptual replication might be useful to pursue in the interest of corroborating, fine-tuning, or refuting our results. A good illustration of this is the important question of why there were slightly more apparent risk factors for the ‘Borderline Pathological’ phase of celebrity worship than the ‘Intense–Personal’ phase, as this observation does not perfectly fit the Absorption-Addiction Model. Still, our checklist of risk factors could have been incomplete, or the CCD exercise failed to detect all relevant variables due to insufficient detail.

Lastly, confounds often arise with naturally ‘noisy’ information, including latency effects with retrospective accounts and omissions, embellishments, or fabrications of some or all the key details. To be sure, our literature set had not been peer-reviewed for historical accuracy but instead consisted of commercial books and amateur websites that typically reflected the passionate stance of authors on this topic. Despite the obvious shortcomings of generally unvetted and retrospective data from primary and secondary sources, we contend that our findings cannot be summarily dismissed as artifacts of cursory or exploratory analyses or overreaching interpretations. Indeed, hypothesis-testing with quantitative methods yielded patterns that were largely consistent with theory-driven predictions. We should emphasize that, on balance, the outcomes seemed to reasonably support only two of our three hypotheses.

In closing, we do not maintain that the ‘Billy the Kid Museum’ or any of Robert’s advocates are deliberately exploiting or deceiving people who seek to experience or understand this part of the lore surrounding the Kid. Instead, we regard the Museum as a niche example of ‘heritage

tourism’ that parallels dark and paranormal tourism and its inherent association with historical sites entrenched in enduring emotion, tragedy, or mystery (for a discussion, see Puhle & Parker, 2021). From this perspective, activities such as books, documentaries, and museums devoted to the Brushy Bill enigma might be considered a form of what folklorists call ‘ostension,’ or the acting out of a legend narrative in real life (Tosenberger, 2010). Whether his identity claims ultimately are true or not, Brushy Bill has become a tangible and relatable part of Billy the Kid’s narrative reality for modern history buffs and other enthusiasts. As a result, Sheriff Pat Garrett indeed—one way or another—never really killed Henry McCarty.

IMPLICATIONS AND APPLICATIONS

This study lends further credence to the use of Rasch hierarchies and related analyses for diagnostic purposes, especially in the context of mapping anomalous, aberrant, or esoteric experiences (e.g., Houran et al., 2019; Lange et al., 2020; Lange et al., 2004). Qualitative and quantitative insights from such modeling tactics may further be paired with deep-learning approaches for added power and speed in categorizing behaviors (Kim et al., 2020). Moreover, future studies might affirm the Absorption-Addiction model of celebrity worship as a useful framework for the development or maintenance of alter ego behaviors or identity diffusion (and its measurement; see e.g., Goth et al., 2012). This certainly includes the social media phenomenon of *catfishing*, or when a person creates a fictional persona or fake identity to target and deceive specific victims (Simmons & Lee, 2020). We also suspect that this line of research can inform the tangential topics of *self-validation theory*, i.e., the cognitive and affective validation of one’s thoughts (see Briñol & Petty, 2021) and *avatars*, or the virtual representations of selves in artificial and mediated environments (Fong & Mar, 2015; Sah et al., 2021; Wu, 2013). People indeed tend to behave over time in ways consistent with their avatars’ characteristics, a phenomenon known as the Proteus effect (Ratan et al., 2020).

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information and data in this study are freely available to qualified researchers.

NOTE

¹ Many authorities and online tutorials argue that Wikipedia is not a reliable source for academic writing or investigation, although it has been recognized as a useful first step in the research process (e.g., Tardy, 2010), and Wikipedia entries have been published in peer-reviewed articles (e.g., Odenwald, 2019). Given the pop culture nature of the Brushy Bill mystery, we deemed Wikipedia as one viable source for identifying independent literature to use in our content analysis.

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RESEARCH
ARTICLE

The History, Legalization, and Potentials of Psilocybin- Assisted Psychotherapy

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HIGHLIGHTS

Therapeutic uses of the psychedelic compound 'psilocybin' show great promise but also raise important ethical and legal questions that require careful consideration.

ABSTRACT

The potential benefits and deficits of the chemical compound psilocybin, particularly when paired with psychotherapeutic interventions, have been increasingly apparent topics of interest in social, academic, and scientific circles. The unusual nature of psilocybin poses many questions in Western culture. Three of them, which will be discussed in the following review, are (1) What is psilocybin? (2) What is psilocybin-assisted psychotherapy? and (3) What are the potential advantages and disadvantages of psilocybin-assisted psychotherapy? Psilocybin-assisted psychotherapy is an innovative treatment that has not had the opportunity to be well-studied; as a result, the topic is currently shrouded in controversy and confusion. However, a recent series of clinical trials and research projects involving psilocybin-assisted interventions have yielded significant and beneficial results; indeed, additional trials are under way. The interventions studied include the treatment of end-of-life anxiety, depression, and existential distress in patients with terminal cancer, tobacco addiction, and treatment-resistant major-depressive disorder. Investigation into the known history, uses, relevance, and therapeutic effects of psilocybin-assisted psychotherapy require a careful inquiry, as these interventions are making an unavoidable and profound impact on contemporary American psychological culture as well as society in general. The current review attempts to describe psilocybin's shamanic roots, known history, legal controversy, psychotherapy, and contemporary neuroscience research.

KEYWORDS

Entheogens, psilocybin, psychedelics, psychotherapy

INTRODUCTION

The phenomenon known as *psilocybin-assisted psychotherapy* is gaining attention in the fields of Western medicine, neuroscience, pharmacology, psychiatry, and psychology. Psilocybin-assisted psychotherapy is showing a profound potential for confronting clients, moving them through their deeply held traumas, irrational belief systems, and psychological disorders.

The following discussion will explain and elaborate on the known history of psilocybin and its use. Subsequent

sections will describe the discovery and synthesis of the chemical compound psilocybin in Western culture during the 1950s, as well as the earlier shamanic uses of psilocybin mushrooms, followed by the research and controversy in the West during the 1960s that led to psilocybin's classification as illegal under Federal law in 1970. Next, the historical events that allowed psilocybin and similar compounds to be studied again and to be employed legally in Western scientific and psychotherapeutic settings will be discussed.

Later sections will elaborate on both the potential



benefits and dangers of psilocybin-assisted interventions. They will discuss recent and relevant research and various psychotherapeutic approaches that are encompassing psilocybin, with an emphasis on humanistic and transpersonal psychotherapies.

Psilocybin

In 1955 an American mycologist, researcher, and vice president of J. P. Morgan, R. Gordon Wasson, discovered a species of mushroom in Oaxaca, Mexico, which produced powerful and peculiar effects. Wasson's curiosity led him to invite the mycologist and Director of the Musée National d'Histoire Naturelle in Paris Professor Roger Heim, to accompany him to Oaxaca to classify and describe these mushrooms of interest (Hofmann, 1959, p. 252). When Heim went to Oaxaca with Wasson in 1956, he obtained some of the mushrooms for further study. After transporting them back to his laboratory in Paris, he was successful in classifying as well as growing cultures of the mushrooms in question, naming the species *psilocybe Mexicana Heim*. In 1956 Heim sent a specimen to the Sandoz Research Laboratories in Basel, Switzerland, for chemical investigation (Hofmann, 1959, p. 252).

The term *psilocybin* was introduced in 1957 by Albert Hofmann; it is the name of the active principal molecule isolated from the *psilocybe Mexicana Heim* species of mushroom. It belongs to the *psilocybe* genus that includes more than 100 mushroom species discovered worldwide that contain psilocybin (Johnson & Griffiths, 2017, p. 735). After isolating the psilocybin molecule from the *psilocybe Mexicana Heim* in 1957, Hofmann and his team successfully synthesized a crystalline psilocybin compound in 1958 (Hofmann, 1959, pp. 251–253). Sandoz Laboratories marketed the synthetic under the name *Indocybin* for a brief period in the 1960s (Johnson et al., 2017, p. 144).

The chemical name for psilocybin is *4-phosphoryloxy-N,N-dimethyltryptamine*; it is known as an indole hallucinogen. When ingested, psilocybin dephosphorylates inside the body, converting psilocybin into the molecule psilocin (*4-hydroxy-N,N-dimethyltryptamine*) (Catlow et al., 2013, p. 481), which is a potent agonist at serotonin 5-HT_{1A/2A/2C} receptors, with 5-HT_{2A} receptor activation directly correlated with psychoactive effects (Grob et al., 2011, p. 71). The observed effects of psilocybin include the dilation of pupils, increased blood pressure and heart rate, nausea, auditory and visual hallucinations, distortion of auditory and visual stimuli, altered body sense, and alteration of temporal sense. The reported effects that contribute to introspection and often patients' increased receptivity to advice have led to its use in psychotherapy (Johnson et al., 2017, pp. 149–150).

In 1970, under orders of US President Richard Nixon and his administration, psilocybin and other so-called "hallucinogens" were placed in the Schedule I category of the United States Controlled Substances Act of 1970 (United States, 1970, p. 1236). In retrospect, this action seems to have been due to these substances' implicated involvement in and influence on the anti-war protests and counter-culture movements during the 1960s (Lee & Shlain, 1985, p. 93). All recognized "hallucinogens," including psilocybin, remain in Schedule I status to the current day. That status implies that the chemical has no accepted medical or therapeutic use and has an elevated risk of physiological and psychological dependence; moreover, there is an alleged lack of accepted safety for use of the drug or other substance under medical supervision (United States, 1970, p. 1247).

The initial name given to these compounds by researchers in the 1940s and 1950s was "psychotomimetic," because they assumed that these specific compounds induced a temporary psychosis (Pollan, 2018, p. 145). In this light, it was thought that, by having participants voluntarily ingest psilocybin or other "psychotomimetic" substances, psychotherapists could gain direct experiential, albeit temporary, understanding and insight into the psychological processes of patients suffering from psychotic disorders (Wasson et al., 1977, p. 138).

As inquiry and research pertaining to the nature of these compounds in the 1950s ensued, the assumption that they produced psychosis was ultimately ruled out by researchers, along with the term "psychotomimetics," when it became apparent that even though the effects of these compounds were powerful and disorienting, they did not produce psychosis (Pollan, 2018, p. 162). The term for these psychoactive chemicals, e.g., psilocybin, LSD, DMT, and mescaline, became known as *psychedelics*, a word derived from two Greek words meaning "soul manifesting" or "mind-manifesting." In 1956, Humphry Osmond was discussing the potentials of these substances with Aldous Huxley and how the unfortunate and ultimately misleading stigma related to psychosis involving these substances must be removed and the name changed (Pollan, 2018, p. 162). History shows that Osmond's term *psychedelic* won favor over Huxley's proposed term *phanerothyme* (p. 163).

The term and category of *psychedelics* has remained popular since its proposal in 1956. However, the term *entheogens*, which is derived from the Greek word *entheos*, was proposed in 1977 by Wasson et al., meaning "God (*theos*) within" (p. 139). Some of the terms used for centuries by many Native/Aboriginal/Indigenous shamans and healers, as well as many contemporary psychologists, for these chemicals in their unaltered plant forms, such as psilocybin mushrooms, are in English translation "sacred

mushrooms" (Carod-Artal, 2015, p. 45), "sacred plants," "sacred medicines," "plant medicines," "sacred plant medicines," or "entheogenic plant medicines" (Bourzat & Hunter, 2019, p. 27). Psilocybin is most commonly labeled as a "psychedelic," "hallucinogen," or "entheogen" in the current scientific research literature and legal documentation.

Shamanic Use of Psilocybin Mushrooms

The anthropological term *shaman* was initially introduced by the explorers and conquerors of eastern Siberia in the second half of the seventeenth century who had heard the term used by Tungusian tribes (Laufer, 1917, p. 361). Although the derivation of the term is uncertain, the Tungus word *saman* translates into "one who is excited, moved, or raised" (Casnowicz, 1924; Lewis, 1990, pp. 10–12).

The term *shaman* and the term for the shaman's practice of *shamanism* are both categorical Western scientific labels used to describe a variety of unique individuals. Harner (1990) stated that "shamans—whom we in the 'civilized' world have called . . . 'witch doctors'—are the keepers of a remarkable body of ancient techniques that they use to achieve and maintain well-being and healing for themselves and . . . their communities" (p. xix). Winkelman (1990) conducted a survey of some eighty societies, past and present, finding distinctions among four major groups: shamans and healers, mediums and diviners, priests and priestesses, and witches and sorcerers (p. 312).

The practices included within the term *shamanism* are as complex as they are controversial. The unique characteristics of shamanism, having been confirmed to appear in centralized societies as well as hunter-gatherer and fishing societies, suggest that shamanism was, and continues to be, a vital and versatile societal resource for survival and psychological development of the human species (Krippner, 2000, p. 94).

The technologies and techniques that produce so-called shamanic states of consciousness include the ingesting of entheogens, as well as focused concentration, chanting, dancing, fasting, drumming, running, jumping, sleep deprivation, "participating in sexual activity, refraining from sexual activity, [and/or] engaging in lucid dreaming" (Krippner, 2000). Additionally, rock and cave image-making may have served the function of recording the images elicited in shamanic states of consciousness (p. 107). In this light, shamanism can be seen as a venerable medical, religious, mystical, spiritual, and psychotherapeutic tradition (Walsh, 1989, p. 6). In 1620, the Roman Catholic church abolished the practice of shamanism in the lands that they controlled, as well as the use of entheogens, including psilocybin, declaring that their use was "an act of superstition condemned as opposed to the purity

and integrity of our Holy Catholic Faith" (Pollan, 2018, p. 109). Many social scientists unfavorably viewed shamans as well, until their functions were more clearly understood (Walsh, 1989). There are a vast number of techniques and technologies in the shaman's repertoire, but, for the sake of the current review, our focus will be on the shamanic use of psilocybin mushrooms for healing and spiritual development.

The use of psychedelic mushrooms was widespread among Mesoamerican cultures, as there is archaeological evidence of mushroom use in Mexico, Guatemala, Honduras, and El Salvador, where so-called "'mushroom stones' . . . dated 3,000 B.C.E., have been found" (Carod-Artal, 2015, p. 42). A ritual bundle discovered in southwestern Bolivia contained traces of five different psychoactive compounds, including dimethyltryptamine (DMT). The bundle was radiocarbon dated to approximately 1,000 C.E. (Miller et al., 2019, pp. 11207–11210).

The shamanic use of psilocybin mushrooms in Mexico was considered to be of such importance that they had given more than two hundred different names, including the unusual and rare word *teonanacatl* ("divine mushroom") (Guzmán et al., 1998, p. 190). The use of the species *Psilocybe*, *Russula*, and *Boletaceous* fungi as sacred mushrooms have been reported among several aboriginal tribes in New Guinea (p. 191). Numerous species of neurotropic fungi have been found in the U.S., Mexico, Central and South America, Europe, Siberia, southwestern Asia, and Japan, showing a large distribution of the *Psilocybe* genus on all the inhabited continents (Guzman et al., 1998, p. 197).

Borovicka et al. (2012) added that a species of *psilocybe* mushroom is known to grow throughout the regions of Northern California, Western Oregon, Western Washington, and British Columbia became known as *psilocybe-alleni*, named after mycologist John W. Allen, who made the discovery in 2011 (p. 185).

Given the worldwide distribution and prevalence of *psilocybe* mushrooms, as well as documentation and information pertaining to their ritual use by many diverse tribes and shamanic cultures across the world, one might suggest that *psilocybe* mushrooms have been used for the purposes of survival, healing, and spiritual development since 70,000 B.C.E. and possibly earlier.

HISTORY OF PSILOCYBIN RESEARCH IN THE WEST

The initial appearance in Western scientific literature of psychedelics occurred in the late 19th century with the discovery of a cactus containing mescaline. In 1886, the German pharmacologist Louis Lewin published the first systematic study of the cactus, to which his own

name was subsequently given, *Anhalonium lewinii*. (Huxley, 1954/2011, p. 1). After chemists isolated and synthesized the mescaline alkaloid in 1886, mescaline research was conducted sporadically (p. 1). However, it never gained the serious attention from Western science, media, or culture that psilocybin and LSD achieved during the 1940s to 1960s.

In 1927, anthropologist William McGovern published ethnographic research in his book *Jungle Paths and Incan Ruins*, describing in detail a shaman's profound experiences after ingesting a psychoactive brew called *yage* (pronounced yah-hey), also known as *ayahuasca* (eye-uh-wass-kuh), along with tribal members in a Peruvian rainforest.

In 1934, Bill Wilson, who later co-founded Alcoholics Anonymous (AA), decided to try a remedy called the "bel-ladonna cure" described as "infusions of a hallucinogenic drug made from a poisonous plant," during his fourth stay in a New York City detox center while struggling with alcoholism. Wilson did not believe in God at the time, but the treatment resulted in a first-hand experience with "God" or a "higher power," and it is said that Wilson never consumed alcohol again (Brooks, 2010, p. 1). In the 1950s, Wilson later went on to advocate for LSD in the treatment of alcohol addiction, attempting to include it in AA, but his recommendation was turned down by fellow board members (Pollan, 2018, p. 153).

In 1935 Albert Hofmann undertook the study of the fungus *ergot* (Hofmann, 1979/2009, p. 37), with the goal of synthesizing a chemical compound of a folk medicine used to facilitate childbirth. In the early 1930s, W. A. Jacobs and L. C. Craig of the Rockefeller Institute of New York had succeeded in isolating and characterizing the primary chemical compound from the ergot fungus, naming it *lysergic acid* (Hofmann, 1979/2009, p. 41). In 1938, Hofmann produced the twenty-fifth substance in the series of lysergic acid derivatives: lysergic acid diethylamide, abbreviated to LSD-25 for laboratory usage (p. 44). The objective of this compound was to obtain a circulatory and respiratory stimulant (an analeptic). This objective failed, and the project was discontinued until 1943, when Hoffmann intuitively decided to re-examine the compound (p. 44).

In 1938 Harvard botanist Richard Evans Schultes travelled to Oaxaca, Mexico, after becoming intrigued by fifteenth-century accounts of sacred mushrooms written by Spanish friars. Schultes discovered that the mushrooms were a vital resource for spiritual ceremonies among the Mazatec peoples of Oaxaca. Schultes published his findings and collected specimens but did not himself consume or experience the effects of the mushrooms (Sheldrake, 2020, p. 116).

Albert Hofmann and the LSD Experience

On April 16, 1943, while working on the final stages of repeating the synthesis of the LSD-25 compound, Hofmann became overwhelmed with vertigo and restlessness and could not concentrate on his work (Hofmann, 1959, p. 244). Hofmann noted that the faces of his associates as well as nearby objects underwent optical changes. While still in this state, he decided to go home and lie down, where, with his eyes closed, what he called "fantastic pictures of extraordinary plasticity and intensive colour" seemed to surge towards him (pp. 244–245). During the process of synthesizing the LSD-25 compound, Hofmann had unintentionally absorbed a minuscule amount of LSD-25 through the pores of his fingertips, causing these peculiar effects. This experience ignited Hofmann's curiosity and the decision to take a specific quantity of the compound (p. 245). This occurrence was the first human experiment with LSD. Hofmann later noted that he had chosen a dose that was five to ten times too high (p. 246), which led him to experience the fear that he was going out of his mind, even though he remained clearly aware of his condition (p. 245). In 1947, the first systematic study of LSD was carried out by W. A. Stoll, who examined its pharmacological and hallucinatory aspects (Hofman, 1959, pp. 246–247).

Aldous Huxley, *The Doors of Perception* (1954)

In 1952, a young British psychiatrist named Humphry Osmond was conducting research on LSD as well as mescaline at Weyburn Hospital in Saskatchewan, Canada (Lee & Shlain, 1985, p. 45). Osmond's primary interest resided in mental illness, especially psychosis, which attracted the attention of Aldous Huxley, the eminent British novelist who for years had been alarmed by the specter of drug-induced thought control (p. 46). However, Huxley also believed that drugs could have a profound and beneficial effect (p. 46).

In 1953, under Osmond's supervision, Huxley offered himself as a test subject, undergoing and later recording his firsthand experiences upon ingesting mescaline. The details of this experiment were later published in his book, *The Doors of Perception* (1954). Huxley then swallowed four-tenths of a gram of mescaline dissolved in half a glass of water and sat down to wait for the outcome, one that he later described as "without question the most extraordinary and significant experience this side of the Beatific Vision" (cited by Lee & Shlain, 1985, p. 46). He added that the mescaline experience "opens up a host of philosophical problems, throws intense light and raises all manner of questions in the fields of aesthetics, religion, theory of knowledge" (p. 46).

Huxley theorized that “the function of the brain and nervous system is to protect us from being overwhelmed and confused by this mass of largely useless and irrelevant knowledge . . . leaving only that very small and special selection” deemed to be practically useful (p. 8). Huxley believed that each human being was potentially a vast unrestricted ocean of consciousness that he referred to as “Mind at Large,” claiming that it must be funneled through a consciousness-reducing valve in the brain and nervous system. This process during ordinary states of awareness consists of a minuscule trickle of consciousness that will help us to survive on the surface of this planet (p. 8). Huxley proposed that the mescaline experience impairs the efficiency of the cerebral reducing valve, adding that the mescaline experience is as near a finite mind can ever come to “perceiving everything that is happening everywhere in the universe” (p. 10). Huxley’s explorations with mescaline, and later LSD and psilocybin, were self-directed and designed to explore consciousness; indeed, the success of his book attracted the attention of a large segment of the educated public to the existence of psychedelics for the first time in history (Lee & Shlain, 1985, pp. 46-47).

R. Gordon Wasson and Maria Sabina

In 1955, the decision to introduce the ancient, sacred, shamanic wisdom of the *psilocybe Mexicana* mushroom to the Western world was made by a remarkable shaman, or *sabia*, from Oaxaca, Mexico, named Maria Sabina. Sabina had felt called to become a *sabia* (i.e., “one who knows”), ingesting psilocybin mushrooms as a way of discovering the condition and treatment of her clients (Krippner, 2000, p. 94). Sabina claimed to have received a message one night while dreaming that it was her mission to share this sacred knowledge more widely. Soon after this dream, on June 29, 1955, a team of U.S. investigators headed by R. Gordon Wasson arrived at her home (p. 94).

Wasson had pursued a lifelong interest in mushrooms as a personal hobby, travelling around the world with his wife, Valentina, to learn about their roles in Indigenous societies (Leer & Shlain, 1985, p. 72). Wasson’s travels in search of sacred mushrooms led him and his friend photographer Allan Richardson to the town of Huautla in Oaxaca, Mexico, where they met Maria Sabina. In 1957, *Life* magazine published a seventeen-page spread, complete with color photos, written by Wasson, titled “Seeking the Magic Mushroom.” The article gives a straightforward and detailed account of the entire sequence of events that took place during this happenstance, yet profound, historical encounter.

Wasson (1957) explained that, directly after he and Richardson arrived in the Mixtec mountains of Mexico, he

had found a *municipio*, or town hall, and approached the *sindico*, or official in charge, requesting to learn about the “divine mushroom.” The officer agreed and then led them to the bottom of a ravine, where an abundance of the mushrooms was growing. After gathering some in a cardboard box, they were then taken to meet Maria Sabina at her home (p. 2).

Wasson went on to describe the events of the evening, explaining that, after gathering in the basement of the officer’s house after 8 p.m. they were given chocolate to drink, as is often done ceremonially before ingesting the mushrooms. Around 10:30 p.m., Sabina cleaned the mushrooms, and, while praying, passed them through the smoke of resin incense. She then set aside 13 pairs of the mushrooms for herself, after which she handed Wasson and Richardson six pairs each. Then the ceremony took place in total darkness, after the mushrooms were eaten. Sabina snuffed out the flame from the only candle in the room, which remained dark until dawn. After 30 minutes of waiting in silence, Wasson and Richardson began to see visions, occurring whether their eyes were open or closed, and including harmonious vivid colors, art motifs that evolved into gardens and palaces, mythological beasts, and the development of philosophical ideas underlying imperfect images of life (p. 4).

Wasson then turned his attention to Maria Sabina, observing that, during the initial stages of the experience, they saw Sabina waving her arms rhythmically and beginning a low, disconnected humming that soon took the form of articulate syllables. Sabina’s chanting then came forth in stages, “with a full-bodied canticle, sung as if it were very ancient music.” After they fell asleep around 4 a.m. and awoke at 6 a.m., their hosts served them coffee and bread, and they went on their way to tell of the experience (Wasson, 1957, p. 6).

The historical significance involved in this happenstance encounter is reflected by Wasson (1957), who stated that “Richardson and I were the first white men in recorded history to eat the divine mushrooms, which for centuries have been a secret of certain Indian peoples. . . . No anthropologist had ever described the scene that we witnessed” (p. 2). Wasson, who was extremely well-connected, on a successive trip to Mexico in 1956 convinced Professor Roger Heim, the experienced mycologist, to accompany him, so that they could classify these mushrooms (p. 10). Heim was successful in doing so; later, Heim, along with his colleague Cailloux, succeeded in growing cultures of several of these mushrooms in his Paris laboratory, sending material from a particularly active fungus, *psilocybe Mexicana Heim*, to the Sandoz research laboratories in Basel for chemical investigation (Hofmann, 1959, p. 252). By 1957, Hofmann and his team were able to isolate the active compound from

the mushroom, giving it the name *psilocybin*; the following year, they successfully synthesized a crystalline psilocybin compound (Hofmann, 1959, pp. 252–253). Hofmann also conducted self-experiments with psilocybin, confirming the drug's psychoactive effects. In 1962, Hofmann accompanied Wasson on a return trip to see Maria Sabina. Hofmann offered Sabina pills of synthesized crystalline psilocybin and she accepted, swallowing two of the pills and confirming that they indeed contained the spirit [essence] of the mushroom (Pollan, 2018, p. 113).

Millions of people read Wasson's article in *Life* or saw a follow-up documentary about it on television. The success and attention given to Wasson's exciting and provocative encounter with Maria Sabina (given the name Eva Mendez in the *Life* article) and these remarkable mushrooms resulted in thousands of people, including celebrities and rock stars, flooding to Huautla in search of Sabina and the mushrooms. Sabina's decision to share the mushroom ceremony with Wasson was severely criticized by male elders in her village, who had kept knowledge of their sacred mushrooms secret; her decision violated the political power of her society's male hierarchy (Krippner, 2000, pp. 94–95). "Huautla had become first a beatnik, then a hippie, mecca, and the sacred mushrooms, once a closely guarded secret, were now being sold on the street" (Pollan, 2018, pp. 113–114).

The people of her village blamed Sabina for all the destructive and ruinous attention and damage done to Huautla, and she was briefly jailed, her home was destroyed (Pollan, 2018, p. 114), her grocery store was burned to the ground, and her son was murdered (Krippner, 2000, p. 95). Maria Sabina proclaimed that "from the moment the foreigners arrived the saint children [mushrooms] lost their purity. They lost their force; the foreigners spoiled them. From now on they won't be any good" (cited in Pollan, 2018, p. 114). The above circumstances demonstrate the initial controversy around psilocybin reaching Western culture, but this was only the beginning.

The Harvard Psilocybin Project

Shortly after Wasson's *Life* magazine story was published, Timothy Leary, who was a Berkeley-trained psychologist transitioning into his newly appointed lecturer position in clinical psychology at Harvard University in 1959, took an interest in Wasson's experience (Wark & Galliher, 2010, p. 235). Richard Alpert was a colleague of Leary's at Harvard's Center for Research in Personality. They initially became drinking buddies and later began teaching courses together (Ram Dass, 1971, p. 11).

Once Leary had settled in at Harvard in 1960, he traveled to Cuernavaca, Mexico, where he was introduced to an

anthropologist and learned about the divine mushrooms and where they could be obtained from a woman in the mountains (Ram Dass, 1971, p. 12). Leary ate the mushrooms and had a profound experience, claiming, "It was above all and without question the deepest religious experience of my life" (cited by Lee & Shlain, 1985, p. 73). Leary also stated that he "learned more in six or seven hours of this experience than I had learned in all my years as a psychologist" (Ram Dass, 1971, p. 12).

In 1960, not long after returning to Harvard after his first experience with psilocybin mushrooms in Mexico, Leary decided to consult with Aldous Huxley. Leary and Huxley, along with a group of graduate students at Harvard, contacted Sandoz Laboratories, receiving a test batch of their synthetic crystalline psilocybin compound marketed under the name *Indocybin* (Johnson et al., 2017, p. 144). Alpert returned to Harvard from vacation, and was invited to join Leary's research program, the Harvard Psilocybin Project (Wark & Galliher, 2010, p. 235).

This project was established in 1960, signifying the beginning of serious academic research into psilocybin (Pollan, 2018, p. 140). Its first study, which took place in 1961 (Wark & Galliher, 2009, p. 235), consisted of evaluating the efficacy of psilocybin on recidivism rates of thirty-two inmates at the Massachusetts Correctional Institute in Concord, a maximum-security prison (Lee & Shlain, 1985, p. 75). The pilot study was successful in the short term, concluding that 25% of inmates who took psilocybin re-offended, as compared to the 80% that was the normal rate (p. 75).

In 1962, the project attempted to create a religious experience for twenty seminary students by giving them psilocybin inside a chapel, on a day of religious significance, namely, Good Friday, titling this study, "The Good Friday Experiment" (Wark & Galliher, 2009, p. 236). Leary, along with his assistant Walter Pahnke, who was a Harvard doctoral candidate, administered psilocybin to ten of the seminary students, giving another ten a placebo, setting in place a "double-blind" study (Lee & Shlain, 1985, p. 76). The results revealed that nine out of ten students who received psilocybin had an "intense religious experience," but only one individual from the placebo group claimed to have had a similar experience. Pahnke concluded his doctoral dissertation, based on this research project, by stating that the described experiences of individuals who had taken psilocybin were "indistinguishable from, if not identical with" the classical mystical experience (cited in Lee & Shlain, 1985, p. 76), including "loss of time sense; objects more beautiful; being able to operate at several levels at once; extreme pleasure, ecstasy, cosmic joy, paradise; feeling of being very wise; knowing everything; [and] feeling that nothing need be said" (Havens, 1964, p. 217).

At the beginning of their research project in 1960, Alpert and Leary were affiliated with Harvard's Department of Social Relations, which was a part of Harvard's Center for Research in Personality. Although understanding that psilocybin showed no indication of addiction, Harvard insisted that Leary and Alpert not give it to undergraduate students, on the ground that they had heard of students experiencing "acute psychosis" after taking hallucinogens (Wark & Galliher, 2010, p. 235).

In the summer of 1961, Aldous Huxley introduced Leary to a man named Michael Hollingshead, who had contacted Huxley, asking for existential advice as well as what he should do with an exceptionally large amount of LSD that he had in his possession. Huxley directed him to Harvard to meet Timothy Leary (Lee & Shlain, 1985, p. 83), who, after his first LSD experience, was so stunned that he wandered about dazed and confused for nearly two weeks until the point when his two closest associates, Richard Alpert and Ralph Metzner, were extremely concerned, believing that he had done himself severe psychological damage (p. 84). Eventually, curiosity led Alpert and Metzner to assess the substance themselves; Hollingshead then supplied all the members of the psilocybin project with LSD, and from that point on LSD was a permanent constituent of their research (p. 84).

During the fall of 1961, Leary and Alpert supplied many graduate students with psilocybin and LSD, inciting increasing hostility from Harvard faculty (Wark & Galliher, 2010, p. 235). In an attempt to increase knowledge of psychedelics, Leary and Alpert started a group called the "International Federation for Internal Freedom" (IFIF), asking undergraduate students to join and form research cells and allowing them access to psychedelic compounds. The IFIF published a journal called *The Psychedelic Review* and organized a commune in Newton, Massachusetts. At this point, undergraduate students were obtaining psychedelics from an underground laboratory near campus or through the mail (Wark & Galliher, 2010, p. 236).

In late 1961, Harvard College Dean John U. Monroe and the director of the Harvard University Health Services, Dana Farnsworth, M.D., demanded that Alpert and Leary stop using students as research subjects. Leary's LSD escapades had started to become a growing topic of conversation around Harvard, as an already existing negativity reached its bursting point in March 1962, when members of the Harvard faculty, during a meeting, insisted that Alpert and Leary alter their research methods or abandon the psilocybin project altogether. Leary's opponents charged that he had been conducting his drug studies in "a nonchalant and irresponsible fashion," noting that trained physicians were rarely present; moreover, they charged that Leary "got high with his test subjects" (Lee & Shlain, 1985, p.

86). The meeting and confrontational exchange appeared on the front page of Harvard's newspaper, *The Crimson*, the next day (p. 87).

In the fall of 1962, Monroe and Farnsworth published a statement in *The Crimson* warning students about the dangers of psychedelics. Gradually, Harvard officials began to demean and discredit Leary and Alpert's research project in what some commentators called "a blatantly degrading level of intellectual respectability" (Wark & Galliher, 2010, p. 237). This led to the mass spreading of discrediting and often ridiculous rumors, ranging from holding alleged wild undergraduate LSD parties to selling psychedelics on the illegal market (Lee & Shlain, 1985, p. 88).

Leary was soon notified that a medical doctor must be present when the drugs were administered if he were to continue his research. Later, in a thinly disguised attack on Leary and Alpert, the U.S. Food and Drug Administration (FDA) maintained that LSD was too unpredictable and powerful to allow access to irresponsible individuals, especially when they advocated using it for drug-induced, "pseudo-religious," instead of medical or scientific, purposes. Alpert and Leary were soon ordered to surrender all their psilocybin to the university health service, and, at the end of 1962, the Harvard Psilocybin Research Project was permanently terminated (Lee & Shlain, 1985, p. 87).

Ironically, while Leary was being castigated, the CIA was engaging in the MK-ULTRA Project, an attempt to counter the "brainwashing" employed by Communist countries against imprisoned U.S. soldiers. The Project tried electroshock as well as LSD, the latter being administered to both volunteers and unwitting participants in settings as diverse as universities and hospitals, prisons, and brothels. The body of one unwitting participant, a CIA employee, was found on the pavement (having fallen off the roof of a building)—perhaps a suicide, perhaps not. His family sued the CIA successfully and President Gerald Ford, much to his credit, wrote a personal apology to the family (Talbot, 2015).

In April of 1963, Timothy Leary took leave from Harvard University without notice and was eventually fired for neglecting his teaching duties. On May 27, 1963, Richard Alpert was fired, when the Harvard Administration presented a student claiming that Alpert had provided him with psilocybin as an undergraduate in 1962 (Wark & Galliher 2010, p. 237). Following their dismissal from Harvard, Leary and Alpert were determined to continue their research in a completely unrestricted manner, conducting additional studies focused on evoking religious, philosophical, and spiritual practices during the psychedelic experience (Lee & Shlain, 1985, p. 96). They travelled abroad with the International Federation for Internal Freedom (IFIF) group, eventually being expelled from both Mexico and the

Caribbean Island of Dominica. In 1963, they started a commune and “psychedelic research center” for spiritual and religious seekers in a sixty-four-room mansion on a four-thousand-acre estate in Millbrook, New York (pp. 97–118).

In 1965, Leary and Alpert went their separate ways (Pollan, 2018, p. 205). Leary went on to live his life as a messianic media figure for the psychedelic counterculture, earning a place on the FBI’s top ten most-wanted list and the title of “Public Enemy Number One” from President Richard Nixon. His numerous drug arrests, a prison escape, a subsequent absconding from the law, and constant provocation by the U.S. Government led to a stern prison sentence for Leary in 1973 (Lee & Shlain, 1985, p. 273). Alpert flew to the Himalayas on a spiritual journey, where he found a teacher who made a profound impact on his life. He then changed his name to Baba Ram Dass and returned to the U.S. as a spiritual teacher, author, and lecturer. His 1971 book, *Be Here Now*, described the Harvard days with Leary and his transformation from Richard Alpert to Baba Ram Dass.

The Harvard Psilocybin Project was the beginning and the end of serious academic research into psilocybin in the 20th century. What had been a remarkably fertile and promising period of research that unfolded during the previous decade in Saskatchewan, Vancouver, California, and England, and elsewhere was terminated (Pollan, 2018, p. 140). Some of the best minds in psychiatry had seriously studied these compounds in therapeutic models, some with government funding, only to have this body of knowledge effectively erased from the field (p. 142). Leary’s notoriety obscured from view the role of a resolute but little-known group of therapists, scientists, and both professional and amateur researchers who were trying to develop a theoretical framework to understand these chemicals, and who devised therapeutic protocols to put them to use for healing.

Research and licit clinical use of psilocybin slowed down starting in the 1960s, as amendments in 1962 and 1965 to the 1938 U.S. Food, Drug and Cosmetic Act severely restricted its possession, use, and research (Johnson et al., 2017, p. 145). The societal backlash in the U.S. and other countries in the 1960s resulted in a ban on the possession and marketing of “hallucinogenic” drugs in 1965 in the U.S.; indeed, Sandoz Laboratories discontinued marketing and manufacturing *Indocybin* in 1966 (p. 144). The limitations to research and the sensational media accounts of adverse consequences from the use of psychedelics fueled the perception that psilocybin posed serious risks to patients and the public that were not outweighed by its benefits (p. 144). Since they had never gained formal approval from the FDA for therapeutic use, psilocybin and all other recognized “hallucinogens” were placed in the Schedule I cat-

egory of the U.S. Controlled Substances Act (CSA) in 1970, where they currently remain (p. 144).

U.S. Controlled Substances Act

The Comprehensive Drug Abuse Prevention and Control Act of 1970, which was enacted by the U.S. Senate and House of Representatives during the presidency of Richard Nixon, was published and put into effect on October 27, 1970 (United States, 1970, p. 1236). This historical Act, also known as the U.S. Controlled Substance Act of 1970, placed psilocybin, as well as all other identified “hallucinogens,” in the Schedule I category of the Act.

The United States government lists 64 opiate and opiate-derived compounds, along with 17 hallucinogenic compounds, in that category. The requirements for placement in Schedule I are as follows:

SCHEDULE I. (A) The drug or other substance has a high potential for abuse. (B) The drug or other substance has no currently accepted medical use in treatment in the United States. (C) There is a lack of accepted safety for use of the drug or other substance under medical supervision. (United States, 1970, p. 1247)

A study carried out by Johnson et al. (2017) on the provisions of the Controlled Substances Act (CSA) concluded that psilocybin could provide therapeutic benefits that might support the development of an approvable New Drug Application (NDA), but further studies were required. The authors noted that adverse effects of psilocybin are manageable when administered according to risk management approaches, suggesting that placement in Schedule IV might be appropriate if a psilocybin-containing medicine were approved (p. 143).

Psilocybin is currently in the developmental stages for the treatment of depression and anxiety for patients with a life-threatening cancer diagnosis (Griffiths et al., 2016; Grob et al., 2011; Ross et al., 2016). Moreover, promising “open label” results [meaning a study where both participant and researcher are aware of the psilocybin treatment] have been reported for treatment-resistant major depression (Carhart-Harris et al., 2016; Rucker et al., 2021), addiction to tobacco (Johnson et al., 2014), and alcoholism (Bogenschutz et al., 2017). The removal of psilocybin from Schedule I of the CSA can occur only if a medicinal product containing a Schedule I substance is approved for therapeutic use by the FDA (Johnson et al., 2017, p. 144). If it is determined to be reschedulable, the placement into the appropriate schedule will be subject to the FDA’s abuse potential assessment, entailing detailed analysis into the eight factors of the Controlled Substances Act (p. 144),

namely: (1) abuse potential, (2) scientific evidence of pharmacological effect, (3) current scientific knowledge of the drug, (4) history and pattern of current abuse, (5) scope, significance, and duration of abuse, (6) risk to public health, (7) physiological or psychological dependence liability, and (8) immediate precursor of substance-controlled drugs (pp. 143–144).

The 2017 study by Johnson et al. concluded that all these eight factors, as well as other lines of evidence, when taken together, indicate the profile of a substance that is characterized by some level of abuse potential and potential risks. However, the evidence does not support placement more restrictively than Schedule IV (p. 161).

The Multidisciplinary Association for Psychedelic Studies (MAPS)

The Multidisciplinary Association for Psychedelic Studies (MAPS) is a non-profit psychedelic pharmaceutical company (Emerson et al., 2014, p. 1). The origins and genesis of MAPS took place in 1972 through the initiative of its founder, Rick Doblin, Ph.D. At the age of 18, Doblin devoted himself to renewing legitimate psychedelic research, which had been universally halted. He was also determined to become a legal psychedelic psychotherapist (p. 1).

With the help of a manuscript copy of LSD researcher and psychotherapist Stanislav Grof's *Realms of the Human Unconscious* (2016), given to him by a guidance counselor at the New College of Florida, Doblin began to understand LSD's potential (Emerson et al., 2014, pp. 1–2). In 1984, Doblin and a few colleagues revived a non-profit organization known as the Earth Metabolic Design Lab (EMDL), which became a vehicle to coordinate the responses of the psychedelic psychotherapy community reacting to the apparent move by the Drug Enforcement Administration (DEA) to criminalize MDMA. MAPS was established in 1986 with the goal to facilitate research into the therapeutic uses of MDMA (p. 2).

The chemical name for MDMA is *3,4-methylenedioxy-methamphetamine*. It was discovered and synthesized in Germany in 1917 (Gimeno et al., 2002, p. 1). During the 1950s, MDMA was briefly researched by the U.S. government but was forgotten until the mid-1970s, when it was rediscovered by the psychedelic therapy community (Emerson et al., 2014, p. 2). MDMA is not a classic psychedelic like LSD, psilocybin, DMT, or mescaline, but early observers noted that it triggered acceptance of self and others, increased tolerance of emotionally upsetting material, and improved the ability to address these issues without extreme disorientation or ego loss, all of which constitutes a common effect of classic psychedelics (p. 2). In the U.S., from the mid-1970s up to 1984, MDMA was used as an ad-

adjunct to psychotherapy by several psychiatrists and psychotherapists in the treatment of neuroses, relationship problems, and PTSD, and in 1984 the DEA placed MDMA in Schedule I of the Controlled Substances Act, criminalizing all uses thereof (p. 2).

In 1992, the MAPS Investigational New Drug (IND) Application for MDMA was filed and the FDA reviewed a MAPS-supported protocol submitted by Charles Grob, M.D., then at University of California Irvine, for a study of the use of MDMA in the treatment of pain, anxiety, and depression in cancer patients (Emerson et al., 2014, p. 3).

This action resulted in the FDA's Drug Abuse Advisory Committee recommending that the cancer patient study be postponed until a Phase 1 dose-response safety study was conducted first (Emerson et al., 2014, p. 3). The completion of this study led to the FDA's acceptance of its Advisory Committee's recommendation that human clinical research with psychedelics be resumed and reviewed with the same rigorous standards the FDA used to evaluate research with all other potential prescription drugs (p. 3). Grob's work was originally focused on MDMA, but, after the allowance of legal research with MDMA in cancer patients, a decision in which Grob played a crucial role, Grob decided to focus on psilocybin, instead of MDMA in treating cancer patients. His rationale was that psilocybin research would be less controversial than MDMA research; indeed, in 2003, Grob obtained approval for his psilocybin/cancer patient study (p. 4).

In 2007, MAPS extended its research to Switzerland, evaluating the safety and efficacy of LSD-assisted psychotherapy for patients with end-of-life anxiety secondary to life-threatening illness, receiving approval from the BAG (Swiss DEA), Ethics Committee (Swiss IRB equivalent), and SwissMedic (Swiss FDA equivalent) (Emerson et al., 2014, p. 5). The Swiss study was then accepted in 2008 by the FDA, which was finally open to the possibility of the therapeutic potential of LSD-assisted psychotherapy. With the IND in place, the FDA would accept data from the Swiss study (p. 5). Earlier, the FDA had approved research with MDMA, psilocybin, DMT, ketamine, and mescaline. LSD was the last of the classic psychedelic drugs to be accepted as a research tool. Therefore, acceptance by the FDA of the Swiss LSD protocol was a transformative moment in the psychedelic renaissance (p. 6). As a result of these efforts, MAPS earned a place in psychedelic history.

CURRENT SCIENTIFIC RESEARCH

The current body of scientific research into the potential therapeutic effects of psilocybin began its reemergence in the United States around the turn of the 21st century. Research publications since then have continued to ex-

pand, providing positive results for the treatment of a variety of psychological disorders and psychiatric conditions as well as the effects of psilocybin-assisted psychotherapy on personality structure (Erritzoe et al., 2018). See Table 1.

The current standard treatment model for therapeutic studies of psilocybin involves its administration as a catalyst, an intrinsic adjunct to structured psychotherapy, unlike most psychiatric medications (Johnson & Griffiths 2017, p. 735). Administered in a supportive environment, with preparatory and integrative psychological care, psilocybin has been used to facilitate emotional breakthroughs and renewed perspectives (Carhart-Harris et al., 2017, p. 1). This therapeutic regimen includes screening to exclude those with serious psychotic disorders who could be at possible risk. Moderate increases in blood pressure occur in patients receiving psilocybin, so those at high risk for cardiovascular problems also are excluded. Most of the risks involved in administering psilocybin are feeling psychologically overwhelmed, anxious, confused, and fearful, potentially leading to dangerous behaviors. However, session monitoring, participant preparation, and follow-up discussion about sessions are all thought to minimize the occurrence of such adverse reactions (Johnson & Griffiths 2017, p. 735).

The debut research article, utilizing the protocol described above and marking the revival of safe scientific inquiry into psilocybin, was published in 2011 under the title *Pilot Study of Psilocybin Treatment for Anxiety in Patients with Advanced-Stage Cancer*. In it, Grob et al. (2011) explained that the objective of their pilot study was to explore the safety and efficacy of psilocybin in patients with advanced-stage cancer and reactive anxiety (p. 71). The study design consisted of a double-blind, placebo-controlled study of patients, meaning that half of the participants received psilocybin and half received a placebo; neither the researcher nor the patients were aware of what they received. Patients with advanced-stage cancer and anxiety functioned as their own controls, using a moderate dose (0.2 mg/kg) of psilocybin (p. 71). The setting was a clinical research unit within a large public-sector academic medical center, and the participants consisted of twelve adults with advanced-stage cancer and subsequent anxiety.

The main outcome measures in the study consisted of monitoring safety and subjective experience before and during experimental treatment sessions. Follow-up data included results from the Beck Depression Inventory (BDI), which consists of a series of questions developed to measure the intensity, severity, and depth of depression, as well as the Profile of Mood States (POMS) questionnaire, which describes individuals' moods during the past week including the present day. The POMS Brief, a shorter version of the original POMS Standard, was used for this

study, in conjunction with the State-Trait Anxiety Inventory (STAI) questionnaire, a widely used self-report instrument for assessing both state and trait anxiety (Grob et al., 2011, pp. 71–73). The STAI evaluates the qualities of tension, apprehension, worry, and nervousness, differentiating between the temporary condition of *state* anxiety and the more general and long-standing quality of *trait* anxiety. For example, the STAI state anxiety subscale requests feelings at the moment of filling out the questionnaire, while the STAI trait anxiety subscale asks participants to indicate how they generally feel (pp. 71–73). The results, which were collected unblinded for six months after treatment, stated that safe psychological and physiological responses were documented during psilocybin treatment sessions with no clinically significant adverse events. The STAI trait anxiety subscale demonstrated significant reduction in anxiety at both one month and three months after treatment. The BDI showed an improvement of mood that reached significance at six months, and the POMS identified improvement in mood after treatment which approached but did not reach significance (p. 71).

The study noted that this design's limitations needed to be addressed in future research. Grob and his team concluded that despite these limitations this treatment may provide a model for treatment of the existential anxiety and despair that often accompany late-stage cancer (Grob et al., 2011, pp. 77–78).

Due to the careful and methodical standards to which Grob and his associates adhered, the revival of psilocybin research emerged for the first time since the 1960s, with a strong ethical and scientific foundation (Grob et al., 2013). The study initiated further detailed and disciplined research into incorporating psilocybin-assisted psychotherapy into palliative care.

Griffiths et al. (2016) studied the effects of psilocybin in 51 cancer patients, with life-threatening diagnoses and symptoms of anxiety and/or depression, using a randomized, double-blind, cross-over trial to investigate the effects of an exceptionally low, nearly placebo-like dose of psilocybin compared to a high dose. The results of the study demonstrated the efficacy of a high dose of psilocybin, when administered under supportive conditions, in producing large and significant decreases in symptoms of depressed mood and anxiety, along with increasing quality of life (Griffiths et al., 2016, p. 1194).

Ross et al. (2016) conducted a controlled double-blind, placebo, crossover trial involving 29 patients with cancer-related anxiety and depression, who were given either a niacin tablet (placebo) or psilocybin in conjunction with psychotherapy. Their results showed that psilocybin produced significant, immediate, substantial, and sustained improvements in anxiety and depression, leading to de-

TABLE 1. Selected Studies of Psilocybin-Assisted Psychotherapy

Year	Diagnosis	N =	Placebo	Study Design	Follow-up	Results	
Grob et al.	2011	Cancer-induced anxiety	12	Yes	Double-blind	6 months	Significant reduction in anxiety (STAI), depression (BDI) scores
Griffiths et al.	2016	Cancer-induced anxiety, depression	51	Yes	Double-blind	5 weeks	(80%) significant decrease in anxiety, depression
Ross et al.	2016	Cancer-induced anxiety, depression	29	Yes	Double-blind	6.5 months	(60–80%) anti-depressant, anxiolytic response
Agin-Liebes et al.	2020	Subset of Ross et al., 2016	15	Yes	Long-term follow-up	3.2-4.5 years	(60–80%) anxiolytic, antidepressant response, (71–100%) improved well-being
Carhart-Harris et al.	2016	Major depressive disorder	12	No	Open-label	1 week; 3 months	(100%) reduction, (67%) complete remission; (58%) reduction, (42%) complete remission
Johnson et al.	2014	Tobacco addiction	15	No	Open-label	6 months	(80%) abstinence
Johnson et al.	2017	Subset of Johnson et al., 2014	15	No	Long-term follow-up	12 months; 16 months	(67%) abstinence; (60%) abstinence
Erritzoe et al.	2018	Personality structure	20	No	Open-label	3 months	Significant Decrease in Neuroticism; Increases in Extraversion, Conscientiousness, Openness (NEO-PI-R) scores

creases in cancer-related demoralization and hopelessness, improved spiritual well-being, and increased quality of life. These improvements were sustained for 6.5 months in approximately 60–80% of participants (p. 1161).

Agin-Liebes et al. (2020) conducted a long-term, follow-up of fifteen patients, in treatment that had been conducted by Ross et al. (2016, as described above). The study reported reductions in anxiety, depression, hopelessness, demoralization, and death anxiety between 3.2–4.5-year followups. Approximately 60–80% of participants met criteria for clinically significant antidepressant or anxiolytic responses at the 4.5-year follow-up. Approximately 71–100% of participants rated the experience among the most personally meaningful and spiritually significant experiences of their lives (Agin-Liebes et al., 2020, p. 155).

Depression and anxiety in cancer patients have been associated with lowered treatment adherence, prolonged hospitalization, decreased quality of life, and increased suicidality (Griffiths et al., 2016, p. 1181). Ross et al. (2021) suggested that psilocybin-assisted psychotherapy may be

an effective anti-suicidal intervention following a cancer diagnosis, due to its positive impact on hopelessness and demoralization, as well as its effects on meaning-making. Findings have also implicated psilocybin treatment as a potentially effective alternative to existing antidepressant medications (p. 553). Bossis (2021) explained that a major distinction between psilocybin and most other medications, including antidepressants and anti-anxiety agents, is that the latter must be taken daily to produce desired effects, whereas research into psilocybin demonstrates positive and sustained clinical benefits after only one or two sessions (p. 15).

Psilocybin-assisted psychotherapy, incorporated with palliative care, has been the most widely examined and researched avenue of intervention, due to the beneficial and effective results that have been discovered with reference to extremely fixed and difficult symptoms of treatment-resistant major-depressive disorder, anxiety, and existential distress. However, the range of clinical research studies and publications relating to psilocybin-assisted psycho-



therapy has continued to expand into the possible treatment of many psychiatric and psychological disorders.

Erritzoe et al. (2018) described their research into the effects of psilocybin-assisted therapy on personality structure in a study exploring whether psilocybin with psychological support modulates personality parameters in patients suffering from treatment-resistant depression (TRD). Results indicated that Neuroticism scores significantly decreased, while Extraversion increased following psilocybin-assisted therapy. Openness scores also significantly increased following psilocybin, whereas Conscientiousness scores increased somewhat, and Agreeableness did not change (Erritzoe et al., 2018, p. 368). These results indicate that subjective reports of psilocybin-assisted psychotherapy produced significant decreases in emotional instability; increases in mental, emotional, and psychological flexibility; increases in confidence and the desire to express oneself; as well as increases in focus and attention. The effects of psilocybin-assisted psychotherapy on personality structure provide primary examples of how breakthrough is made possible, enabling new ways of perceiving, thinking, and behaving to emerge.

The Default Mode Network (DMN)

The default mode network (DMN) is a large-scale network that functionally integrates distant brain nodes and mediates among other phenomena, such as wakefulness, awareness, memory, and a variety of related cognitions. It is referred to as “default” because it takes over when emphasis is on processing of internal stimuli rather than those perceived externally. Modulations of the cortical midline network structures involved in higher order mental processes such as self-referential processing may facilitate states of self-transcendence, a proposed key treatment mediator in psychedelic-assisted therapies (Smigielski et al., 2019, p. 208).

Pollan (2018) described the DMN as the tightly linked set of brain structures implicated in rumination, self-referential thought, and metacognition—thinking about thinking (p. 386), or, in other words, self-awareness. Rigid and extremely fixed personal views of ourselves and our relationship to the world rooted in negativity, defeatism, hopelessness, and meaninglessness are created and reinforced in this network. Getting fixated on or overly attached to these narratives, taking them as fixed truths about ourselves rather than as stories subject to revision, contributes mightily to addiction, depression, and anxiety (p. 388).

Psilocybin-assisted psychotherapy seems to weaken the grip of these narratives by temporarily disintegrating the parts of the DMN that reinforce them (Pollan, 2018, p. 389). Carhart-Harris and Friston (2019) explained that the

DMN has been associated with arguably species-defining behavior such as mental time travel, moral decision making, counter-factual thinking, and self-consciousness. In simpler and more mechanistic terms, however, the human DMN can be considered to sit at the top end—or center—of a uniquely deep hierarchical system, i.e., the human brain (p. 322). The available evidence indicates that the functions of the DMN are never turned off, but, rather, carefully enhanced or attenuated (Raichle, 2015, p. 440).

Research suggests that psychedelics mediate their subjective effects by decreases in connectivity within the DMN, modulation of the anterior and posterior cingulate cortex, and whole brain integration (James et al., 2020, p. 3). The subjective mystical-type effects of psilocybin, including ego dissolution, have been at least partially attributed to disruption of the DMN and the prefrontal cortex, allowing ancient brain systems such as the mirror neuron system, which is located in numerous cortical regions, to occupy a more vital role in subjective awareness (p. 3). The profound and often mystical subjective experiences catalyzed by psilocybin are due to the stimulation of 5-HT_{2A} neuron receptors in the brain, suggesting decreased activity and connectivity in the brain’s connector hubs and permitting an “unconstrained style of cognition” (Carhart-Harris et al., 2012, p. 2142). This decrease in DMN activity, which allows for the emergence of unfamiliar brain connectivity and communication, apparently accounts for mystical-type experiences such as *ineffability*, the difficulty in putting experiences into words (Belser et al., 2017, p. 371); the experience of interconnectedness, which involves “the dissolution of normal identity often leading to a feeling of interconnection with other people, the entire planet, or even the universe at large” (p. 369); and experiencing meaningful closed-eye visual phenomena, with varying degrees of complexity; and/or reporting complex visual phenomena described as “visions,” which often involve synesthesia (p. 372).

Alan Watts provided a wonderful depiction of the psychedelically evoked synesthesia, describing it as follows:

The physical world is vibration, quanta, but vibrations of what? To the eye, form and color; to the ear, sound; to the nose, scent; to the fingers, touch. But these are all different languages for the same thing, different qualities of sensitivity, different dimensions of consciousness . . . shape becomes color, which becomes vibration, which becomes sound, which becomes smell, which becomes taste, and then touch, and then again shape . . . Light, sound, touch, taste, and smell become a continuous warp, with the feeling that the whole dimension of sensation is a single continuum or field. (Watts, 1962/2013, p. 20)

5-HT2AR Serotonin Receptor Signaling

Psilocybin is the predecessor of psilocin (4-OH-dimethyltryptamine), a non-selective serotonin 2A receptor (5-hydroxy-tryptamine-2A-Receptor, 5-HT2AR) agonist, meaning that it binds with these chemicals and neurons in the brain, thereby increasing the effects of these neurotransmitters. Both compounds are structurally related to the endogenous (naturally occurring) neurotransmitter serotonin (5-OH-tryptamine, 5-HT) in the brain (Carhart-Harris et al., 2017, p. 1). The 5-HT2AR receptors are primarily expressed in the cortex, especially in high-level association regions such as those belonging to the DMN (Carhart-Harris & Friston, 2019, p. 322). The role of serotonin, and, more specifically, 5-HT2AR signaling, in cognitive flexibility has been substantiated by numerous studies in humans and other animals. Psilocybin and other psychedelics have been found to promote divergent thinking—a key component of creative thinking—as well as expanded associative processing, while impairing conventional cognition (p. 325).

5-HT2AR signaling has also been shown to enhance neural plasticity, the capacity of the brain to adapt and change by making new synaptic connections and neural pathways (Carhart-Harris et al., 2017, p. 1091). Catlow et al. (2013) stated that chemicals that modulate serotonin (5-HT) synaptic concentrations impact neurogenesis, the production of new neurons (Catlow et al., 2013, p. 481). Along with the findings of neurogenesis in their study of the hippocampus on mice injected with psilocybin, Catlow et al. (2013) discovered that psilocybin facilitates extinction of the classically conditioned fear response, suggesting psilocybin's potential therapeutic effects on post-traumatic stress disorder (PTSD) (p. 481). Krediet et al. (2020) explained that the plasticity-promoting properties of psilocybin and other psychedelics may contribute to their rapid anti-depressant and anxiolytic effects (p. 391). Psilocybin has also been shown to decrease amygdala reactivity during emotional processing. As patients with PTSD often show heightened amygdala reactivity, this may increase the brain's ability to process traumatic memories (p. 391).

A pioneering research study conducted by Carhart-Harris et al. (2012) used psilocybin and a task-free functional MRI (fMRI) protocol designed to capture the transition from normal waking consciousness to the "psychedelic state" by mapping cerebral blood flow and changes in venous oxygenation before and after intravenous infusions of a placebo and psilocybin on human participants. Carhart-Harris et al. (2012) suggested, "It seems relevant therefore that activity in and connectivity with the mPFC is known to be elevated in depression and normalized after effective treatment" (p. 2412). The mPFC was consistently

deactivated by psilocybin, with the deactivations correlating with the drug's subjective effects. Depression has been characterized as an "overstable" state, in which cognition is rigidly pessimistic, while trait pessimism has been linked to deficient 5-HT2A receptor stimulation, particularly in the mPFC. MPFC hyperactivity, in turn, has been linked to pathological brooding (Carhart-Harris et al., 2012, p. 2142).

PSYCHOTHERAPEUTIC APPROACHES

Brent and Kolko (1998) defined *psychotherapy* as a modality of treatment in which the therapist and patient work together to ameliorate psychopathologic conditions and functional impairment through focus on the therapeutic relationship; the patient's attitudes, thoughts, affect, and behavior; and social context and development (p. 17). After developing and establishing a solid therapeutic alliance between patient and therapist, problematic thought and/or behavior patterns, psychological issues, disorders, traumas, neuroses, etc., can then be addressed by incorporating the most appropriate, beneficial, and effective psychotherapeutic approach into the psychotherapy.

Sloshower et al. (2020) proposed that, while a variety of biological and psychological mechanisms of action for psychedelic therapy have been proposed, most researchers and therapists have operated under the assumption that the powerful subjective and experiential effects of psychedelic substances play a significant role in therapeutic outcome, in addition to their possible direct pharmacologic effects. It has become a well-established constituent of psilocybin-assisted psychotherapy that subjective effects are highly variable, apparently influenced by psychological and environmental factors, commonly referred to as "set and setting" (p. 12).

Set and Setting

The terms *set* and *setting* were introduced by Timothy Leary, Ralph Metzner, and Richard Alpert (Leary et al., 1964, p. 84). Most current research with psychedelics emphasizes the importance of set and setting to maximize safety, reduce the risk of harmful experiences, and enhance therapeutic responses (Sloshower et al., 2020, p. 13). The term *set* refers to the intention of the individual prior to the experience. It encapsulates hopes, beliefs, traumas, fears, temperament, and personality, as well as the client's fantasies and expectations about psychedelic experiences. The term *setting* refers to the therapeutic environment and physical space in which an individual experiences the psychoactive effects of the substance. This term encapsulates the ambience of the therapists or guides, as well as such factors as music, artwork, and safety equipment (p. 13).

A positive set and setting in psilocybin-assisted psychotherapy provides patients with an adequate sense of safety which allows them to become physically, emotionally, psychologically, and spiritually vulnerable during sessions. The lack of attention to set and setting may lead to detrimental psychological effects. Disturbing situations and/or surroundings, along with unethical or poorly trained practitioners also have the potential to put individuals in severe psychological and physical danger.

Bourzat and Hunter (2019) described a guide as “someone who walks ahead and knows the territory, aware of the potential perils of the terrain” (p. 40). The psychotherapist occupies a role similar to that of a guide, shaman, or curandera, and it is the therapist’s task to facilitate and support the patient’s inner transformation. In this way the therapist integrates psychological understanding with personal growth (p. 42).

Current psilocybin-assisted psychotherapy usually comprises three stages: initial preparation before dosing session or sessions, support during dosing sessions, and integration sessions afterwards (Sloshower et al., 2020, p. 16). It is necessary for the therapist to develop therapeutic rapport with individuals, while providing education regarding the therapeutic approach and the experience itself, as well as discussing logistics of the dosing session and the description of acceptable boundaries of interaction between therapist and participants. Moreover, the therapist needs to establish the participants’ intention regarding what they are seeking to gain from the treatment (p. 16). The support stage takes place during the dosing sessions, which have a duration of approximately 4–6 hours and take place in living-room-like settings in research facilities. The patients, lying on a couch, will typically wear headphones, which play preselected, instrumental music, along with eyeshades to encourage them to direct attention inward to the unfolding changes in consciousness. The eyeshades also prevent distraction from any environmental stimuli, although participants are free to remove either or both the headphones and the eyeshades at any time if they choose (Bossis, 2021, p. 16).

During the dosing sessions, therapists or guides create and hold a “safe space,” or maintain a “safe container,” allowing the participants to be comfortable and vulnerable enough to fully embrace their unique experiences, while gently providing emotional support when difficult sensations, thoughts, feelings, or memories arise. The reassurance of safety and assistance for the participants are key components of the support stage. The integration stage, in most cases, begins the day following the dosing session, and involves a thorough review of the participants’ experience during their dosing sessions, and, in some cases, applying therapeutic techniques, reinforcing important aspects of

the experience, and working towards sustainable patterns of thought and behavior (Sloshower et al., 2020, p. 13).

Humanistic and Transpersonal Psychology

Charles Grob and Anthony Bossis have linked their interest in this topic to their backgrounds in humanistic psychology, a field established with the founding of the *Journal of Humanistic Psychology* (JHP) by Abraham Maslow and Anthony Sutich. Another milestone was the creation of the Association of Humanistic Psychology founded by Carl Rogers, Virginia Satir, and Maslow in 1961 (Grob & Bossis, 2017, p. 315). The humanistic perspective in psychology has a foundational basis that deviated from the models prevalent at the time that were considered to be overly deterministic and restrictive. This humanistic orientation emphasized human potential and its development; indeed, the goals of humanistic psychotherapy focus on facilitating personal growth and self-actualization (p. 315).

As Grob and Bossis (2017) explained, “as the 1960s unfolded, however, Maslow and others identified with the humanistic movement perceived an essential albeit often neglected and denigrated element of human nature, the spiritual dimension” (p. 315). Many psychedelic sessions were marked by profoundly transcendental, mystical, and spiritual effects. The field of transpersonal psychology was established in 1967 when a small group of psychologists, including Abraham Maslow, Anthony Sutich, Stanislav Grof, James Fadiman, Miles Vich, and Sonja Margulies, met with the purpose of creating a new psychology that would honor the entire spectrum of human experience, including various non-ordinary states of consciousness. During these discussions, Maslow and Sutich accepted Grof’s suggestion to name the new discipline “transpersonal psychology” replacing the original name of “transhumanistic,” or “reaching beyond humanistic concerns” (Grob, 2008, p. 47). Shortly afterwards, they established the Association of Transpersonal Psychology (ATP) and inaugurated *The Journal of Transpersonal Psychology* (p. 47). In its effort to fully understand the varying dimensions of consciousness, transpersonal psychology endeavored to integrate the ideas of Western psychology with the insights of Eastern spiritual traditions (Grob & Bossis, 2017, p. 316).

The work of Stanislav Grof, who had recently moved from Czechoslovakia to the United States, was profoundly influential. Grof, an early researcher of the range of therapeutic effects of psychedelics since their emergence in psychological culture, explored the value of the transpersonal model to understand the full range of human potentiality and to harness the potential of psychedelic experiences to facilitate powerfully positive treatment effects (Grob & Halifax, 1977). Grof (2019) explained that he had “observed

and experienced countless paradigm-breaking phenomena, indicating an urgent need for a radical revision of the most fundamental assumptions of mainstream psychiatry, psychology, and psychotherapy” (p. 106).

Where current medications target symptoms of these disorders, altering brain function to repress and numb unpleasant thought and behavior patterns, psilocybin seems directly to confront and disassemble the root foundation on which psychological disorders are formed and perpetuated, allowing for a direct confrontation with and an emotional breakthrough from long held and rigidly fixed thought and behavior patterns. After this process is complete, the ability to create, form, and embrace new and ultimately beneficial ways of thinking and behaving are made possible by implementing specific psychotherapeutic approaches and techniques.

Out of the many approaches available, it seems that practitioners with humanistic and transpersonal psychotherapeutic backgrounds have had the most experience in dealing with the powerful and profound subjective effects of psilocybin-assisted psychotherapy. Three key components of the humanistic and transpersonal approaches that are of crucial importance and benefit when facilitating, counseling, or guiding a psilocybin-assisted psychotherapeutic intervention include: (1) the importance of developing a genuine, supportive, and empathetic therapeutic alliance or relationship between therapist and client; (2) the conduct by the therapist or guide of psychotherapy sessions of practicing continuous unconditional positive regard, in which the therapist is fully accepting of the client, showing no aggressive, assertive, or passive-aggressive judgment such as verbally shaming, displaying disapproving body language and/or gestures, or using verbal sarcasm or sarcastic body language and/or gestures at any time with the client; and (3) responding by restating or rephrasing the client’s statements in a way that highlights the client’s feelings or emotions, sometimes known as the “reflection of feeling” (Pomerantz, 2016, p. 585).

When reflecting back, the therapist or guide should not be telling clients how they feel, but, instead, should be asking clients if their understanding is correct. Therapists should not become overly confident in their ability to read clients’ emotions and should always acknowledge the clients’ expertise on their own feelings (Pomerantz, 2016, p. 586). By adhering to the humanistic psychological technique of reflecting, practitioners do not interject their opinion on the matter or tell the patients how to solve their problems, but instead create and hold a safe space, and ultimately guide clients as they create their own solutions for their psychological dilemmas. This approach often results in patients’ embodying a genuine sense of accomplishment, purpose, and meaning regarding having the

confidence to trust their own individual critical thinking processes and creating their own solutions to their problems. Many individuals in Western culture believe that medical and mental health solutions are given by the practitioner or medical professional to offer a quick fix without working towards helping patients to create a healthier and more balanced physical and psychological lifestyle on their own. In this light, the humanistic approach seems to meet many crucially important criteria involved with safe, beneficial, and successful psilocybin-assisted psychotherapeutic interventions.

Sloshower et al. (2020) asserted that numerous forms of psychosocial interventions could be compatible or adaptable for use in psychedelic assisted therapies, provided there is some theoretical synergism with the pharmacological treatment to produce desired therapeutic outcomes (p. 13). The unique and defining characteristics of psilocybin-assisted psychotherapy reside in making sense of, finding meaning in, and/or discovering a purpose related to the highly specific and personal phenomenological and subjective material that individuals experience during psilocybin dosing sessions.

Bogenschutz and Forcehimes (2017) noted that it was not clear how to integrate the psychedelic experience into treatment models designed to have specific therapeutic effects, such as the amelioration of the symptoms of a specific disorder; in contrast, supportive models of psychedelic therapy are not linked to particular therapeutic orientations, nor do they target the specific disorder being treated. Instead, they provide containment, safety, and clear guidelines to help participants navigate their own psychedelic experience (Carhart-Harris et al., 2016).

CONCLUSION

Notable results of psilocybin-assisted psychotherapy have occurred in the treatment of tobacco addiction and treatment-resistant major-depressive disorder. The beneficial results of this research suggest that the profound and often mystical subjective experiences catalyzed by psilocybin are due to the stimulation of 5-HT_{2A} neuron receptors in the brain, suggesting decreased activity and connectivity in the brain’s connector hubs and permitting an “unconstrained style of cognition” (Carhart-Harris et al., 2012, p. 2142).

This unconstrained style of cognition facilitated by psilocybin, along with adherence to adequate and ethical psychotherapeutic treatment protocols, is showing breakthrough results in the treatment of some of the most difficult, treatment-resistant, psychological disorders, known in the field of mental health. This is due to the unique ability that psilocybin-assisted psychotherapy has to dis-

assemble pharmacologically structured and highly “overstable” neurochemical systems in the brain that sustain, and reinforce, pessimistic and rigidly fixed thought and behavior patterns (Carhart-Harris et al., 2012, p. 2142).

It is important to consider that the primary interest into psychedelics such as psilocybin is the potential that they hold to break individuals out of their fixed and rigid thought and behavior patterns, thereby allowing for a condition that viscerally reveals to the individuals that there is more to life than they had previously thought or believed. This revelation can result in new and beneficial ways of thinking, feeling, perceiving, and behaving. Currently, we face a severely unaddressed mental health crisis in the West. The COVID-19 pandemic and political events since the spring of 2020, have added cultural, societal, and economic upheaval, for which the existing approaches to mental health conditions and disorders are inadequate.

It is not only individuals in Western culture suffering from diagnosed psychological disorders who can benefit from discovering new ways of thinking and relating to consciousness. It is now unavoidably apparent that continuing to adhere to the existing ways of thinking, perceiving, and behaving are dangerously reckless and destructive to the human species and the planet. As Krippner (2000) observed, “shamanic epistemology drew upon perceptual, cognitive, affective and somatic ways of knowing that assisted early humans to find their way through an often unpredictable, sometimes hostile, series of environmental challenges” (p. 98).

Aldous Huxley was an enthusiastic advocate for the potential that psilocybin holds to expand consciousness, declaring that the experience “opens up a host of philosophical problems, throws intense light and raises all manner of questions in the field of aesthetics, religion, theory of knowledge” (cited by Lee & Shlain, 1985, p. 46).

On a parting note, it is difficult to deny the correlation between recent neuroscientific and phenomenological research and Aldous Huxley’s theory of a reducing valve for “Mind at Large.” Research indicates that psilocybin may have the ability to loosen the reducing valve of our limited perceptions of ourselves and the world around us, via the default mode network, allowing for the availability of a much less restricted degree of consciousness, ultimately heightening our perceptions as well as our ability to relate them to consciousness. Equally prophetic was Huxley’s decision to have his wife, Laura, give him an intramuscular injection of 100 micrograms of LSD on his deathbed in 1963, signifying the first self-experiment with LSD for the treatment of palliative care. Huxley was in the terminal phase of throat cancer, and his doctors had explained to his wife Laura that she should prepare for a disturbing and dramatic end to her husband’s life, given that the terminal

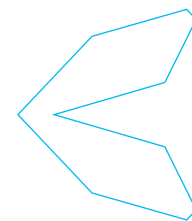
phase of throat cancer is usually accompanied by convulsions and choking fits. Hofmann (1979/2009) explained, “in the morning, when he was already so weak that he could no longer speak, he had written on a sheet of paper: ‘LSD—try it—intramuscular—100 mcg.’ Mrs. Huxley understood what was meant by this, and ignoring the misgivings of the attending physician, she gave him, with her own hand, the desired injection” (pp. 181–182). On November 22, 1963, Aldous Huxley died serenely and peacefully (p. 181).

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**RESEARCH
ARTICLE**

Social Factors and UFO Reports: Was the SARS-CoV-2 Pandemic Associated with an Increase in UFO Reporting?

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HIGHLIGHTS

Analysis shows that an increase in UFO sightings during the 2020 pandemic was merely coincidental and can be explained entirely by sunlight reflected off satellites.

ABSTRACT

The ongoing SARS-Cov-2 pandemic had many drastic effects upon society beyond the illness and death it caused. Pandemic mitigation measures disrupted and altered behaviors related to social mobility, significantly increasing the time spent at home compared to the pre-pandemic period. Further, it was well documented that social anxiety and stress increased at a population level. Early in the pandemic there was speculation in the popular media that reporting of paranormal phenomena (e.g., UFOs, ghosts, etc.) increased due to factors associated with the pandemic. Past research on UFO/UAP reporting has theorized that increases are triggered by social factors, and so the pandemic provided a natural experiment to test these claims. To measure UFO reports we utilized two public databases of UFO reports for sightings in the United States, provided by the National UFO Reporting Center and the Mutual UFO Network. To estimate the impact of the pandemic we utilized two measures, one for social mobility and one for pandemic/disease severity. Google Community Mobility Reports provided a metric of social mobility for people who use Google Maps on their cellular telephone (i.e., amount of time spent at work compared to home), which we aggregated to a state level to estimate time spent at home. Second, we used new weekly SARS-CoV-2 cases and deaths, both absolute counts and per capita, which can be considered to be an indirect measure of anxiety and stress. We find that UFO reports did increase in 2020 compared to 2019 ($p < 0.001$ for both databases); however, the level of UFO reporting had little to no association with the various pandemic-related measures, offering no support for hypothesized social factors that influence reporting. A complicating factor in UFO reporting is the start in 2019 of Starlink satellite launches. These launches include up to 60 small satellites at once, and so are very distinctive and often easily visible. As a result, many people report these as UFOs. We coded and removed these reports from the sighting databases, and the filtered data similarly have no association with the pandemic-related factors. Further, with Starlink reports removed, there was no increase in sightings in 2020 compared to 2019. Our results contribute to an understanding of large-scale factors that impact the reporting of paranormal events, especially timely given the renewed public and government focus on the UFO phenomenon today.

KEYWORDS

UFO reports, UAP reports, SARS-Cov-2 pandemic, MUFON, NUFORC, Starlink



INTRODUCTION

The Coronavirus 2019 (SARS-CoV-2) pandemic has been a great disruptor of societies worldwide, in almost all activities. The pandemic caused many places of work, and most schools, to shut down in almost every Western nation, and these closures continued into 2021. The direct effects of SARS-CoV-2 have been the illnesses and deaths and long-term problems suffered by those infected. The shutdowns and restrictions, as well as general anxiety caused by the pandemic, have led to other deleterious outcomes, including an increase in suicide, depression, problems sleeping, financial difficulties, and social isolation. The restrictions and office and school closures led to changes in the time people spent at home versus away from home, often causing complications for those without adequate household space to conduct work, family, and home tasks.

The effect of the pandemic was not necessarily limited to the more mundane, day-to-day, activities in society. By the spring of 2020, shortly into the pandemic, speculation began about whether there was an increase in reports of ghosts, or of Unidentified Flying Objects (UFOs) (Heaney, 2020; Stevens, 2020), which was quickly picked up by the mainstream press (Jett, 2021; Nir, 2021). This was too soon for any reliable statistics, but the conjecture was based, in part, on the idea that people were home, with more time available to experience odd phenomenon. Additional speculation posited that the increased levels of pandemic-induced anxiety reported at a population level (Peteet, 2020; Salari et al., 2020) could lead to a heightened awareness to events and occurrences that were previously ignored.

In this work, we attempt to provide an answer to this question using UFO reports as the test case. Advantages of using UFO reports include a) thousands of reports are made every year, providing sufficient data; b) fairly rapid reporting by witnesses so that reporting lag is not a serious limiting factor; and c) open access to reporting databases. In this research we use UFO sightings within the United States (US) as the civilian-based UFO reporting apparatus is comprehensive and robust.

The number of yearly UFO reports in the US has not been constant, varying by a factor of 10 in reports to the official US Air Force UFO projects, from 1947 to 1969 (Sparks). That trend has continued since then in sightings collected by civilian groups, including the Mutual UFO Network (MUFON) and the National UFO Reporting Center (NUFORC). Large increases in UFO reports, such as occurred in November 1957, or the fall of 1973, have been termed “waves” by UFO researchers. Waves are, according to Bullard (1998), “. . . any notable and temporary rise in UFO reports above the usual rate.” He notes the important question of “. . . wheth-

er waves mean heightened UFO activity or just heightened publicity and public awareness without more UFOs . . .”

We emphasize that, in this research, we take no position on the various hypotheses for the source of UFO reports—the phenomena that people witnessed that caused them to make a report. UFO groups such as MUFON investigate reports and, in the broadest sense, classify them as identified by a known phenomenon (stars, aircraft, etc.), or unidentified (with a third category of insufficient information to make an identification). We are interested here in the simple fact that a report was made by a person, regardless of classification.

In Figure 1 (upper panel), we display the number of UFO reports submitted to the NUFORC website (www.nuforc.org) over time, by week. We note that prior to the existence of the NUFORC website, they collected reports via telephone, however these reports are not included in their public database. In Figure 1 (lower panel), we present a more recent look at the reports, by week, smoothed with a 25-period moving average, to examine overall trends in the NUFORC database. We draw attention to four features in Figure 1: 1) in general, UFO reports trended down from 2014 to 2019; 2) contrary to what has been reported in the popular media (Jett, 2021; Nir, 2021), the increase in the number of UFO reports began well before the pandemic; 3) the seasonal effects that are present in prior years (reports peak in the summer when more people are outside), diminish over time beginning in 2017; and 4) reports peak early in the late winter of 2020. Though only three years of data were available from the MUFON database, precluding the assessment of longer-term trends, the mid-year peak is evident in both 2018 and 2019, while it is shifted early to the late winter in 2020 (see Figure 2). In Figure 3 we compare the number of reports submitted to NUFORC (black) and MUFON (grey) in 2018–2020 to visually assess the concordance between the number of reports. While similar, there are clearly differences between them, with the Pearson correlation between the two series of 0.58 ($p < 0.001$). Each database will act as a separate test for the effects of the pandemic.

Past UFO waves led to intense press interest, and the public became aware that others were reporting UFOs (Jacobs, 1976). This did not occur during the pandemic: There were not media reports of very large increases of reports across the US, despite the initial speculation, and UFO organizations themselves did not comment on increased reporting. From this we can conclude that a ‘classic’ UFO wave did not happen, but that does not preclude a change in the number of reports that is less dramatic but still substantial.

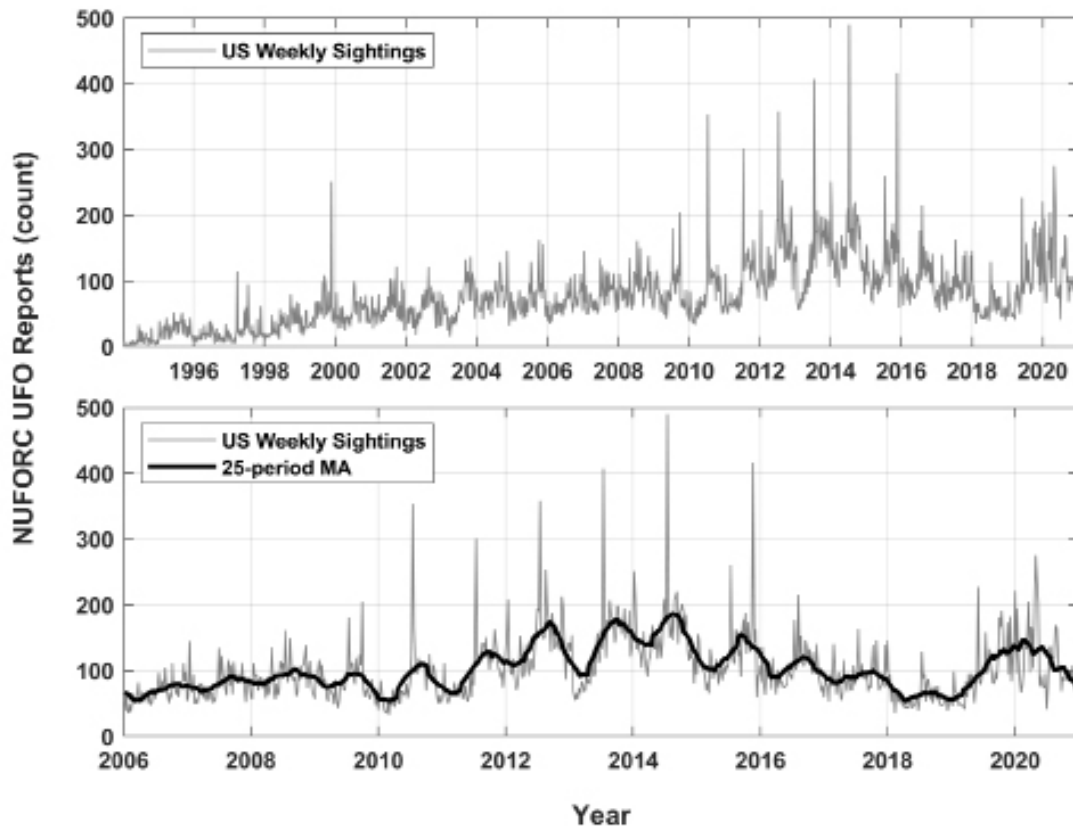


Figure 1. UFO reports submitted to NUFORC. Upper panel: Weekly count of Unidentified Flying Object (UFO) reports submitted to the National UFO Reporting Center (NUFORC), from 1/1/1994 to 12/31/2020. In general, we note that there is typically a clear seasonal effect to report counts, with reporting peaking in the summer. Lower panel: Weekly count of UFO reports submitted to NUFORC from 1/1/2006 to 12/31/2020 (grey) with the 25-period moving average overlaid on the plot in black.

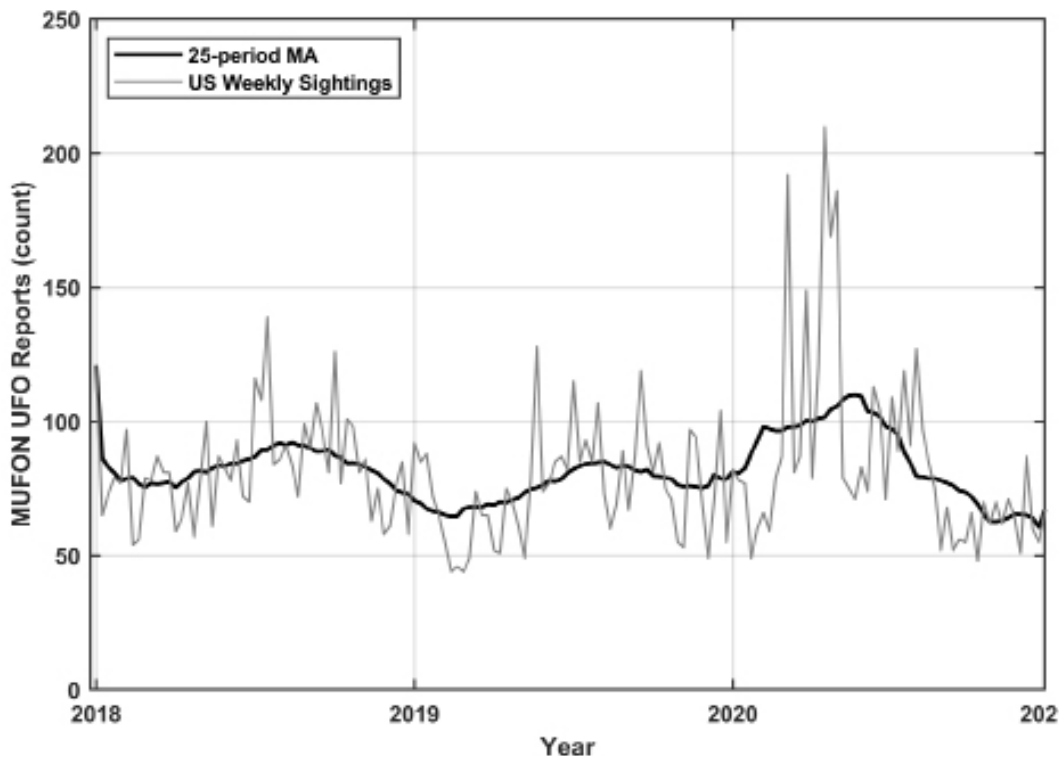


Figure 2. UFO reports submitted to MUFON. The weekly count of UFO reports submitted to the Mutual UFO Network (MUFON) from 1/1/2018 to 12/31/2020 in grey with the 25-period moving average overlaid on the plot in black.

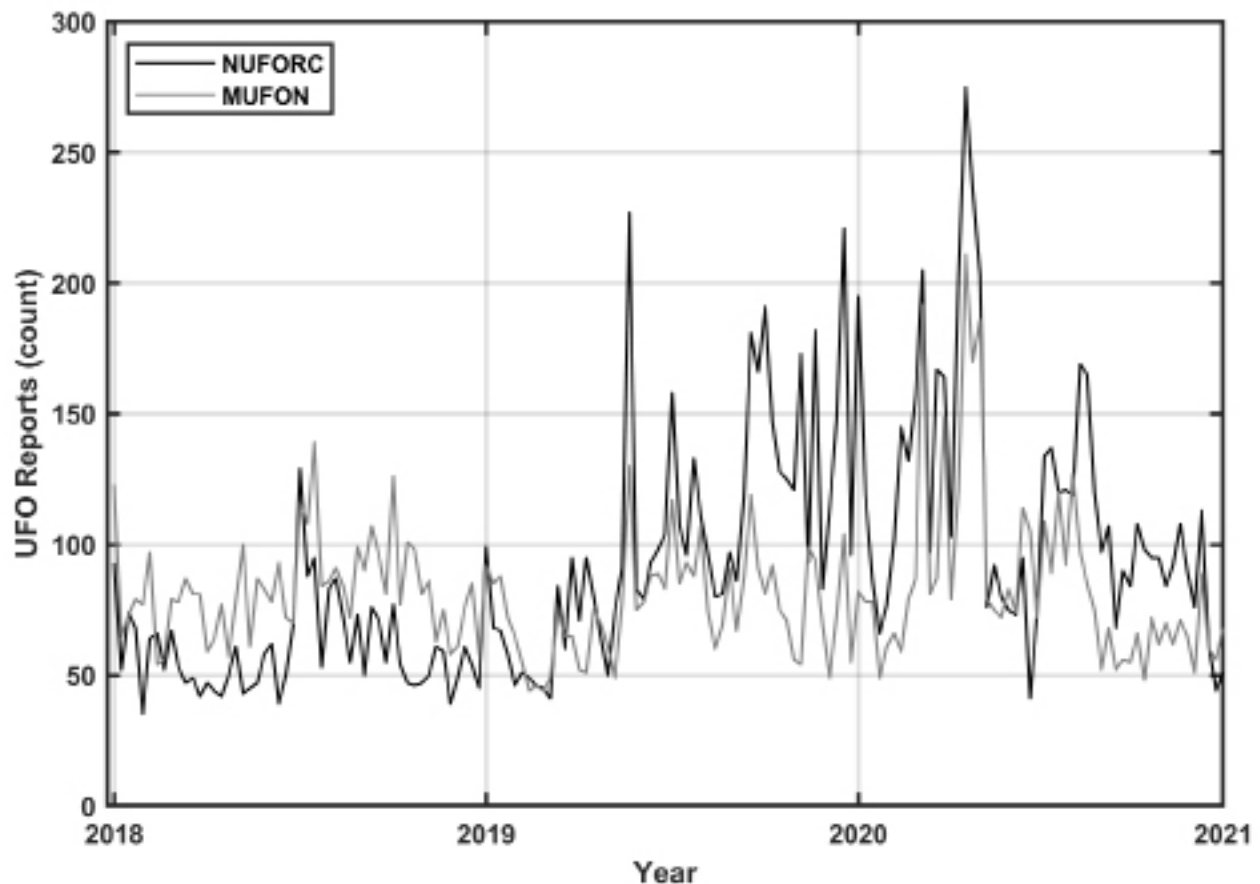


Figure 3. Comparison of UFO reports submitted to NUFORC and MUFON. The black line depicts weekly count of UFO reports submitted to NUFORC and the grey line depicts weekly count of UFO reports submitted to MUFON from 1/1/2018 to 12/31/2020.

Influences on UFO Reporting Dynamics

A UFO report results from one or more people who are in position to observe something unusual (to them), and who then are both motivated to report the experience, and have opportunity to do so (Westrum, 1977). The chief factors related to this process are listed in Figure 4. The proximate factors influencing the number of reports include the following:

1) **Number of phenomena.** People who report UFOs generally have seen *something* in the sky or near the ground. Thus, by definition, if there are more stimuli available, there can be more reports (whether aircraft or, as some contend, extraterrestrial objects).

2) **Opportunity to observe.** People inside buildings have limited opportunities to observe the environment. This is more the case, all things being equal, for those in an indoors work environment compared to being home where there are chances to take a walk, sit outside, etc.

3) **Attention to environment.** To see something a person must be paying attention to their surroundings (although some UFOs are reported to be so bright or large

that they draw attention to themselves). Anything that changes this attention could affect the number of reports.

4) **Willingness to report.** Most people who see a UFO do not report the experience. One key reason is motivation or willingness, which can be affected by concern for how one will be viewed, or whether there will be unexpected consequences of reporting. Conversely, seeing a UFO can be exciting, and people often wish to tell others about their experience.

5) **Time to make a report.** People are busy and have limited time for unplanned activities. Making a report takes time and effort, including finding a reporting organization/site, completing the sighting form, and then perhaps having to email/speak with an investigator. This can be a significant deterrent.

The pandemic led to increased time at home for a large fraction of the population. Although many at home continued working or attending school, the home environment was not as restrictive as being at work, and so one could naturally hypothesize that UFO reports increased commensurate with the proportion of the population at home, compared to previous years. The pandemic did re-

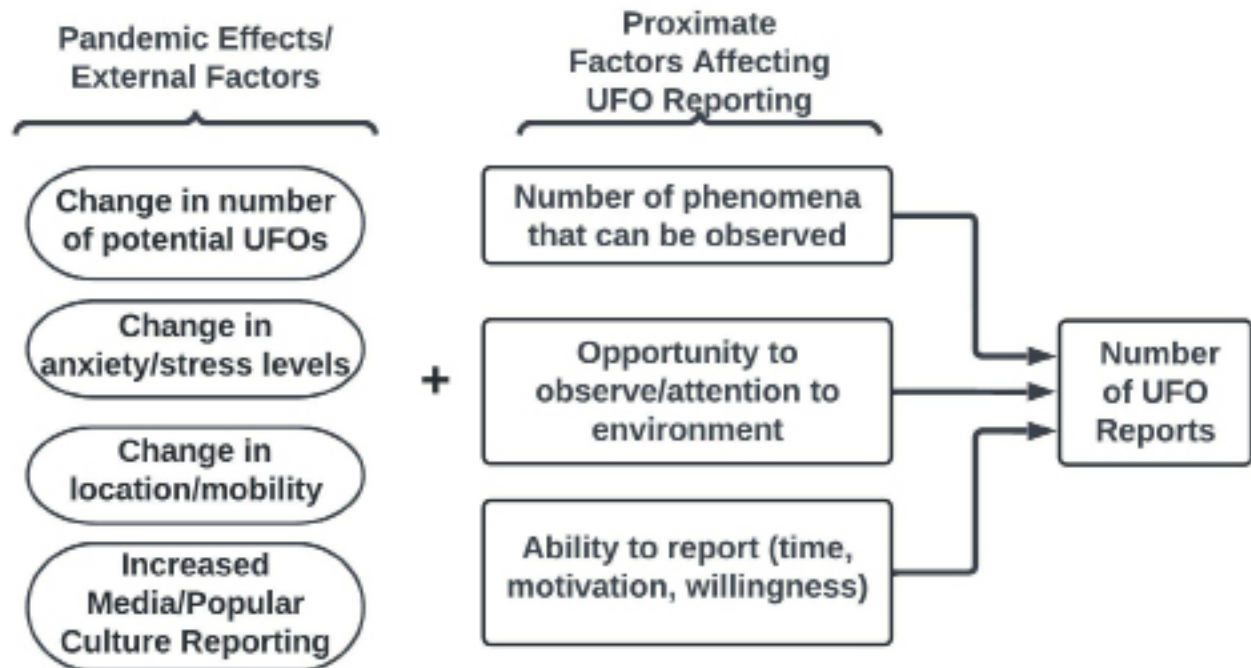


Figure 4. UFO reporting dynamics. Model of physical, social, psychological, and pandemic-related factors that can influence UFO reporting.

quire some people to care for loved ones, it complicated shopping and other daily activities, and so might have decreased the time available to make a report. Nevertheless, given the many anecdotal reports about increased free time (e.g., catching up on projects, binge-watching television series, etc.) (Buga, 2021; Gray, 2020), we expect the overall effect of this factor would be a potential increase in reports.

Past research on UFO waves has suggested that their fundamental cause could be social factors, such as societal crises (the launch of Sputnik in the fall of 1957), economic distress (the oil shocks of the early 1970s), or general anxiety and frustration (the Vietnam War in the 1960s). These are presumed to cause people to enter a state of heightened concern and anxiety and be more watchful of events and, possibly, the local environment. The pandemic caused increased stress for almost everyone (Allen et al., 2022; Knox et al., 2022; Salari et al., 2020), and thus, based on these conjectures, could be presumed to indirectly cause more reports because of increased stress as well as attention to one's environment (Billig, 1982; Escolà-Gascón et al., 2020; Kottmeyer, 1995; Smelser, 1963; Vagues, 1976)

It has been theorized that past UFO waves have been triggered by excessive media attention on UFO reports, which then encourages other witnesses to come forward, in a reverse process to the spiral of silence theory devel-

oped by Noelle-Neumann (1974). UFOs have received more positive publicity recently because of favorable coverage by mainstream media, after a story in *The New York Times* on December 4, 2017 (Cooper, 2017). However, UFO reports themselves were not highlighted in the news during the pandemic (as compared to the noted speculation about the number of reports), and so we suggest this factor had a minor role to play in changing the level of reports by varying the willingness to report.

The number of potential UFOs might seem impossible to estimate, but there is another space-based, but human-caused, source which complicates investigating the variation in UFO reporting. The company SpaceX, founded by entrepreneur Elon Musk, has an ambitious program to launch thousands of small satellites to provide internet service across the Earth, especially to areas without reliable access. The constellation of satellites is named Starlink, and by the end of 2021 more than 1700 had been launched, typically in groups of 60 at a time (Wikipedia, 2022). These satellites in the period after launch form a 'train' in orbit, following one after the other, and are visible with the naked eye. While they have often been reported and photographed, and the media have covered the sightings and written about the project, many people remained unfamiliar with the Starlink project. Thus, an observation of multiple Starlink satellites moving together (as compared

to a single satellite traversing the sky), would seem highly unusual.

The first test satellite constellation of Starlink was launched in May 2019, and the first operational launch was in November 2019, with launch frequency increasing in early 2020. This coincides closely with the beginning of the pandemic restrictions in the United States in mid-March 2020. UFO reporting sites began receiving reports of 'UFOs' that were clearly caused by Starlink in 2019 after the first launches; as a consequence, organizations attempted to alert witnesses, and still do until today, by providing information about Starlink on reporting pages on their websites, though this had a limited effect. Thus, any consideration of UFO reporting dynamics in 2019–2020 must consider Starlink satellites.

In summary, the UFO reporting proximate factors, and pandemic effects or external factors that influence them, generally suggest that reports should have increased during the pandemic. It is impossible to accurately estimate the magnitude of an increase, but our primary hypothesis is that UFO reporting will increase shortly after the pandemic shutdowns occurred and last for many months thereafter. We expect that over time these effects could diminish, so we restrict the analysis to calendar year 2020 and the immediately preceding years for comparison.

DATA AND METHODS

The three sources of data included in this analysis were UFO reports; pandemic-related data such as mobility, time at home, and SARS-CoV-2 cases and deaths (Coronavirus, 2021); and Starlink launch dates and satellite configurations.

UFO Reports

Two sources of UFO reports were used for this research. The National UFO Reporting Center (NUFORC) is an online reporting center that has recorded reports at its website since the mid-1990s. It includes sightings before that date because of retrospective reporting. Basic report information is freely available to the public. The Mutual UFO Network (MUFON) is the largest civilian US group that investigates UFO sightings (www.mufon.com). Reports can be made at its website and searches can be done for reports by various characteristics, although full access is only available to MUFON members.

Complete NUFORC data were downloaded on February 15, 2021; MUFON data were provided on March 1, 2021, for the years 2018, 2019, and 2020. We note that, when people choose to report a UFO sighting, they typically do so within a few days of the event (Antonio et al., 2022),

however this is not always the case; due to these reporting delays, some sightings from the 2018–2020 period will be reported after the data were accessed, but the number will be small compared to the total for each database of about 5,000 reports per year. Only reports from the United States are used in this analysis.

Sighting characteristics included in the MUFON data include: submission date, sighting date and time, city, county, state, shape, sighting description, and case disposition. The disposition (cause or source of the report) is coded by MUFON investigators from a review of the report details, witness interviews, and other investigation into the sighting (e.g., flight radar to show aircraft in the area at the time). Sighting characteristics included in the NUFORC data include: submission date, sighting date and time, city, state, shape, duration, and sighting description. NUFORC is not an investigative organization and does not classify the possible source for a report, although possible hoax cases are noted.

We are interested in the current analysis with the simple fact that a UFO report was made, not how a case was classified by a UFO organization (with one exception as described below). Reports without a sighting description were not included because, as we explain below, all reports had to be coded as caused by the Starlink satellite constellation, or not. Blank reports made up ~0.2% of reports in the NUFORC database and 0.3% of reports in the MUFON database. Raw UFO report data required extensive cleaning: 1) When examining reports at the county level, any report for which the county could not be identified, often due to typographical errors upon report entry, was removed; 2) Duplicate entries were removed; 3) Only reports that originated from the United States were considered; 4) 'Hoaxes' were removed—both NUFORC and MUFON have procedures to indicate reports that are clearly made in jest. Additionally, for the NUFORC database only, beginning in the middle of 2018, magnetic anomalies detected by the Multiple Anomaly Detection and Automatic Recording project (MADAR; <https://madar.site/madar/more.html>) were added to the NUFORC database, but these are not UFO reports as such, so they were removed before analysis. The inclusion of MADAR anomalies in the NUFORC data means that the use of unfiltered NUFORC data for research, a common practice by media organizations and others, will selectively bias upward UFO reporting statistics.

Pandemic-Related Data

To quantify the effect of pandemic-induced behavioral changes (e.g., lockdowns, work-from-home, bar/restaurant closures, etc.), we utilized the Google Community Mobility Report (<https://www.google.com/covid19/mobil->

ity) which provides a metric of how much time people who use Google Maps spent at various places, including home, work, public transit, retail, and social locations, compared to a baseline of data collected prior to the first detection of SARS-CoV-2 in the United States. As this data is highly inter-correlated, we define a single metric as to the extent that a region followed social-distancing related pandemic mitigation measures by summing the time spent at home (relative to the baseline) for each state, noting that this metric was essentially the inverse of time spent at work and leisure (retail, restaurants, etc.). These data were aggregated at the state level by necessity as data privacy considerations precluded reporting at a finer resolution for counties that are less populated. The number of new SARS-CoV-2 cases and deaths are a direct measure of pandemic/disease severity. These measures are used as proxies for anxiety and stress in the population.

Starlink Launches

Starlink launches by SpaceX began with a test of two satellites on February 22, 2018, with the first test of 60 satellites on May 24, 2019, and the first operational launch of 60 satellites on November 11, 2019 (Mann, 2022). The Wikipedia page for Starlink includes a full spreadsheet of all launch information and these data were used for launch dates and other related information, specifically which satellite launches were launched with a sunshade to limit optical reflection, discussed below. Starlink satellites are distinctive because in the period after launch—a few days to weeks—the 60 satellites often form a long train that moves swiftly across the sky, generally from west to east. Starlink satellites do not have their own illumination and are visible because they reflect the Sun's light from various components, such as the antenna. Many Starlink satellites are above a limiting visual magnitude, depending on location, time of day, and sky brightness, and so easily observed by individuals with no visual aid (Boley et al., 2021).

As criticisms of Starlink's interference with astronomical observations increased, Starlink took several measures to reduce satellite brightness, with the key alteration being the addition of a sunshade (Visorsat) to shade the area causing illumination from reflected sunlight (Mallama, 2021; Mallama, 2021). Beginning with the August 7, 2020, launch, all satellites were equipped with the sunshade. This has reduced the apparent brightness of a typical satellite by approximately 50% (Mallama, 2021). We investigate whether this had a separate effect on Starlink-caused UFO reporting.

Coding UFO Reports for Starlink

UFO witness sighting descriptions range from extremely terse ("lighted orbs") to extremely verbose, running to hundreds of words. Generally, NUFORC descriptions are somewhat lengthier than MUFON descriptions because of how the reporting process is structured. Some reports have no description and so could not be coded.

Reports caused by Starlink are generally easily identified. Here are representative examples from the two databases: MUFON ("at least 50 bright lights following each other about 20 seconds apart."); NUFORC ("About 20–30 lights in total appeared in the night sky, traveling in the same trajectory. First one appeared, traveled 4 finger distance then the second one appears where the first one originated and the line continued in that order, speed and distance.").

Two of the authors reviewed the MUFON (LM) and NUFORC (MR) database case descriptions, beginning with the first launch of a Starlink satellite constellation (May 24, 2019). Cases were coded into these three categories: Not Starlink, Starlink, or ambiguous. Coding rules are included in the supporting document (Cockrell et al. Supporting Material). Essentially, at least 3 lights (not objects) had to move in a straight line, at about the pace of a typical satellite (more than a few seconds across the sky, but not many minutes), and during darkness, as Starlink satellites are not bright enough to be viewed with the naked eye in sunlight or even twilight. Location was also used to make a determination because several Starlink reports often came from the same state at the same date and time, and so a report that might be more difficult to code could be assigned to Starlink based on similar and nearby sightings.

To calculate inter-rater agreement, we extracted 200 reports each from the MUFON and NUFORC databases from late February to early March 2020, a period during which Starlink satellites were visible. Each rater coded reports from the database he or she had not previously reviewed, and then the Fleiss kappa statistic was calculated (Fleiss, 1971). Kappa was 0.89 with a 95% confidence interval from 0.79 to 0.99. A kappa of this magnitude is viewed as high and quite adequate to support the reliability of, in this instance, our UFO report coding for Starlink observations. Coding rules were validated by reviewing a subset of reports from late 2018 when no Starlink satellites had been launched; we identified no reports as Starlink in this set, further supporting the reliability of the coding.

Statistical Analysis

To examine the potential causal effect of the pandemic on UFO reporting, we first compared the number of reports by year with a one-sample chi square test to determine whether reports did increase. We then compared the weekly SARS-CoV-2 cases and deaths to the report differential between 2019 (when there was no pandemic) and 2020 on a per-capita and raw basis, aggregated geographically by state, using a standard Pearson correlation (Benesty et al., 2009). To examine the effects of pandemic-mitigation measures, colloquially referred to as the “lockdown,” we created a single metric to describe the magnitude of the lockdown response. This metric was developed by summing the weekly (state-level) measurements for additional time spent at home; states that, on average, spent more time at home (compared to a control baseline) had a greater magnitude of the lockdown response. We compared the ranks of differential UFO reporting per state and lockdown response per state using the standard Spearman correlation (Wissler, 1905). To examine the effect of the lockdown on UFO reporting at a national level, we compared the time series of UFO reports (with Starlink sightings, and with Starlink sightings filtered out), to the time series of the CMR ‘time-spent-at-home’ measurement using a Pearson cross-correlation. We calculated direct correlations and then differenced correlations to remove trend in the series. Finally, we compared the number of reports by year with Starlink reports filtered out. All analyses are done separately for the MUFON and NUFORC databases. MATLAB software was used for analyses and figures.

RESULTS

The impetus for this work was the reporting (Jett, 2021; Nir, 2021) that UFO reports were spiking due to the SARS-CoV-2 pandemic. In Table 1 we compare the number of reports in 2018, 2019, and 2020 for NUFORC and MUFON. As noted earlier, reports to NUFORC had already been increasing in 2019, but this was not true for MUFON. The increase of more than 600 reports to NUFORC, and almost 600 reports to MUFON, in 2020 compared to 2019, was significant for each database ($p < 0.001$). Thus, while not a classic UFO wave, UFO reports did increase in 2020.

TABLE 1. Total UFO Reports by Year, Separately for NUFORC and MUFON

UFO Reporting Site	2018	2019	2020	P-value*
NUFORC	3058	5262	5882	<0.001
MUFON	4315	3929	4503	<0.001

*P-values for a comparison of sum of reports in 2019 to 2020, using a one-sample chi square test.

We next investigate factors that could be related to this change in reporting. In Figure 5, we compare the weekly UFO reports submitted to NUFORC (upper panel), and MUFON (lower panel), with new weekly SARS-CoV-2 cases (dashed line) and new weekly deaths that were attributed to SARS-CoV-2 (grey line). Data are normalized to a range from 0 to 1 for each series. While there is a spike in UFO reports that coincides with the onset of the pandemic, these time series are generally uncorrelated (see Table 2).

To examine the effects of pandemic-mitigation measures, colloquially referred to as the “lockdown,” we utilized CMR data provided by Google to examine if additional time spent at home influenced UFO reporting, shown in Figure 6, and again no meaningful correlation was found. UFO report data are normalized to a range from 0 to 1; CMR data are normalized to data from the previous year and so can have values below 0 or above 1. We also ranked each state by a measure of their aggregate pandemic mitigation, which was calculated by summing the weekly measurements from the CMR for 2020 and compared this to the difference in UFO reports from 2019 to 2020 by total reports (Figure 7, left panel), and per-capita reports (Figure 7, right panel). There is no association between the lockdown response and raw report difference or per capita report difference (Pearson correlations of 0.22. and 0.10, respectively; $p = 0.12$ and 0.48 , respectively). See Table 2.

Upon further examination of the data, it became apparent that the increase in UFO reports was due to the launch of Starlink satellites, which began in 2019, and which introduced a novel visual phenomenon.

We hypothesize that the unique and unparalleled (at the time) appearance of these sightings provided a significant motivation to file a UFO report. In Figure 8, we compare the time series of all UFO reports (black lines) with Starlink launches before (dotted lines) and after (dot-dashed lines) the addition of a sunshade to the satellites to prevent some amount of interference with astronomical observations, for NUFORC reports (upper panel) and MUFON reports (lower panel). In Figure 9, we examine only the reports that are clearly reports of Starlink satellites, noting the excellent concordance between NUFORC and MUFON reports. The association between launch dates and an increase in Starlink reports is evident, and the number of reports that are attributable to Starlink satellites is reduced by approximately a factor of 10 after the sunshade is added to Starlink satellites. While the sunshade does not render the satellites completely invisible, it significantly reduces the number of UFO reports that are directly attributable to Starlink.

In Table 2 we quantify the relationship between lockdown and pandemic health measures and the UFO report data with a set of correlations between a) case differences between 2019 and 2020, both unadjusted and per capita,

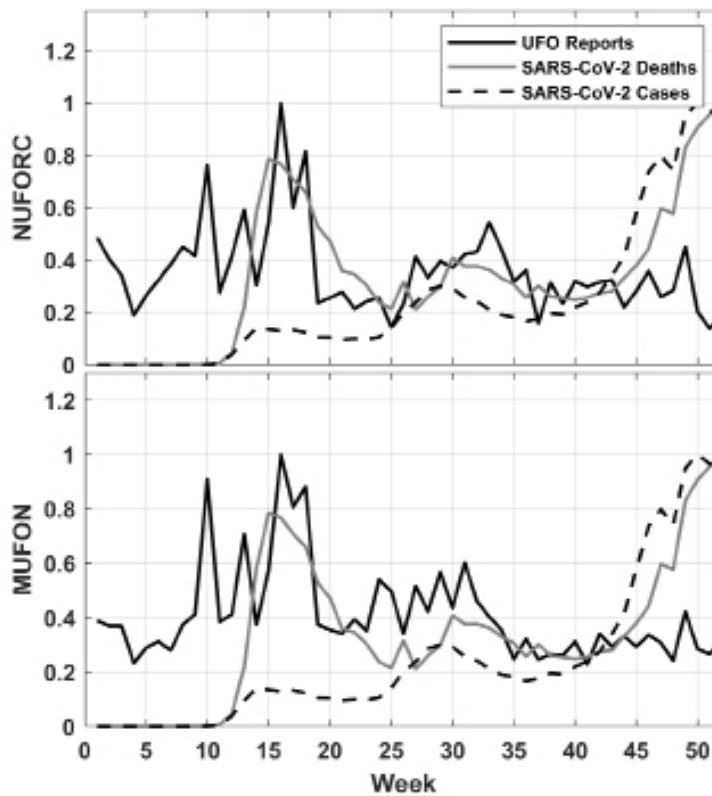


Figure 5. Comparison of UFO report counts with measures of the SARS-CoV-2 pandemic. (Upper panel): The weekly count of UFO reports submitted to NUFORC (black line) is compared with the weekly count of new SARS-CoV-2 cases (dashed line) and deaths (grey line). (Lower panel): We compare the weekly count of UFO reports submitted to MUFON (black line) with new SARS-CoV-2 cases and deaths, line types as above. All metrics have been normalized by dividing the series by its maximum value, resulting in a measure that can vary from 0 (indicating a true zero) to 1 (indicating maximum value in that time period).

TABLE 2. Pearson Correlations between Total UFO Reports and Pandemic Statistics (cases, deaths, excess time spent at home)

	NUFORC		MUFON	
	Statistic	P-Value	Statistic	P-Value
Differences Aggregated by State				
Starlink Filtered				
UFO Report Difference (2020–2019) per capita vs. Lockdown Response	-0.01	0.97	-0.09	0.53
UFO Report Difference (2020–2019) per capita vs. SARS-CoV-2 Cases per capita	0.10	0.49	0.24	0.08
UFO Report Difference (2020–2019) per capita vs. SARS-CoV-2 deaths per capita	-0.07	0.60	0.08	0.56
UFO Report Difference (2020–2019) vs. Lockdown Response	-0.06	0.69	0.12	0.40
UFO Report Difference (2020–2019) vs. Total SARS-CoV-2 Cases	0.19	0.18	0.06	0.67
UFO Report Difference (2020–2019) vs. Total SARS-CoV-2 Deaths	0.06	0.67	0.02	0.89
With Starlink				
UFO Report Difference (2020–2019) per capita vs. Lockdown Response	0.07	0.65	-0.04	0.76
UFO Report Difference (2020–2019) per capita vs. SARS-CoV-2 Cases per capita	0.17	0.25	0.29	0.04
UFO Report Difference (2020–2019) per capita vs. SARS-CoV-2 deaths per capita	-0.06	0.68	0.09	0.54
UFO Report Difference (2020–2019) vs. Lockdown Response	0.18	0.21	0.23	0.10
UFO Report Difference (2020–2019) vs. Total SARS-CoV-2 Cases	0.23	0.11	0.05	0.71
UFO Report Difference (2020–2019) vs. Total SARS-CoV-2 Deaths	0.05	0.71	0.01	0.97

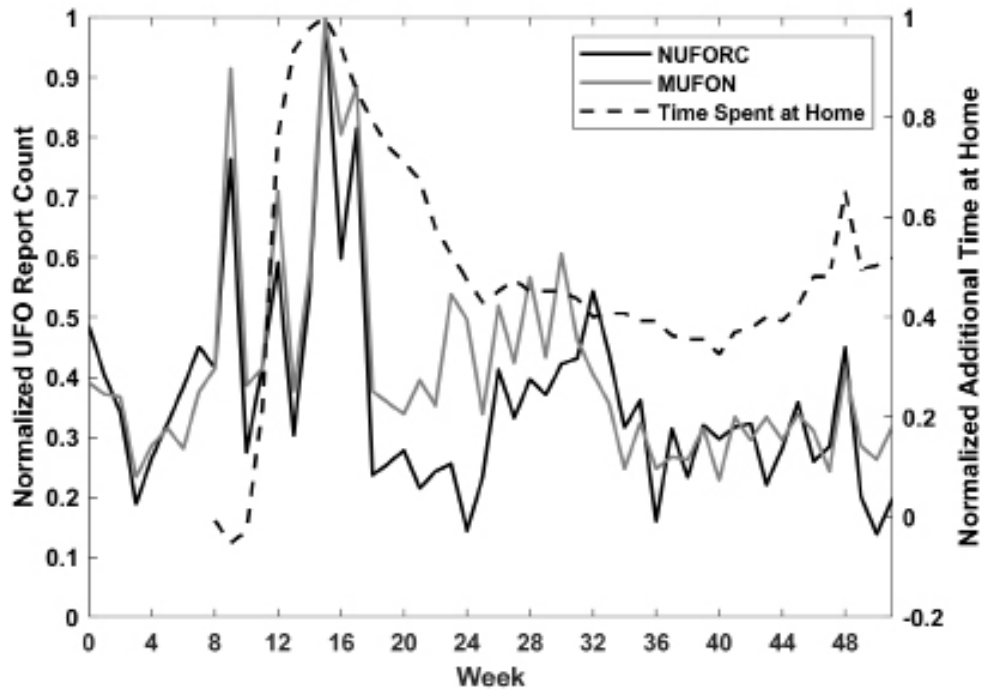


Figure 6. Comparison of UFO report counts with additional time spent at home. The weekly count of UFO reports submitted to NUFORC are shown in black; the weekly count of UFO reports submitted to MUFON is shown in grey; the additional time spent at home due to pandemic mitigation efforts, compared to a 6-week baseline measurement at the start of the year, is shown with the dashed line. UFO reports have been normalized by dividing the series by its maximum value, resulting in a measure that can vary from 0 (indicating a true zero) to 1 (indicating maximum value in that time period). CMR data are normalized to data from the previous year and so can have values below 0 or above 1. While the peak number of reports submitted to NUFORC and MUFON coincides with maximum additional time spent at home, these time series are generally uncorrelated in most of 2020.

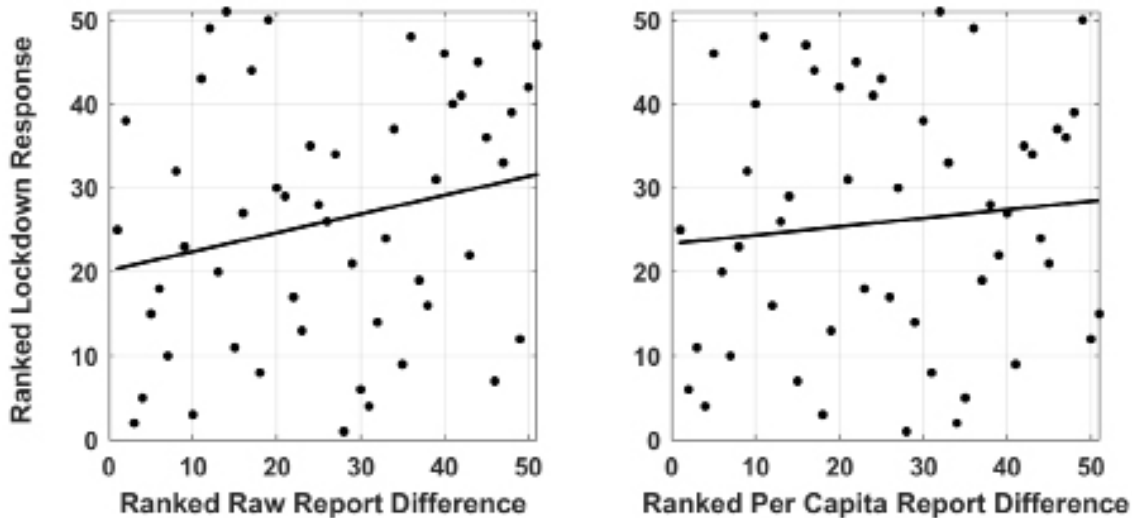


Figure 7. Rank of lockdown response compared with rank increase in UFO reports from 2019 to 2020. (Left panel) We compare the rank of lockdown response with the rank of increase in UFO reporting for each of the 50 United States and the District of Columbia. The rank of the lockdown response is defined such that the state which spent the most additional time at home (see Figure 6) has the highest rank. (Right panel) Depicts the same comparison, however UFO reports are now normalized on a per-capita basis (per state). Additional time spent at home was not correlated with an increase in UFO reporting on a state-by-state basis.

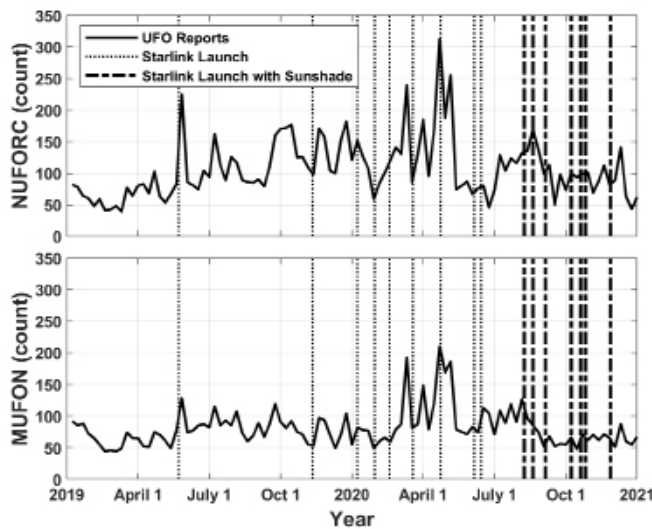


Figure 8. Weekly UFO reports annotated with Starlink launches. (Upper panel): Weekly count of UFO reports submitted to NUFORC is shown with a solid line; Starlink satellite launches are indicated with a vertical dotted or dashed line. The dashed vertical line indicates the satellites were launched with a sunshade to minimize reflected light (visibility). (Lower panel): Similar comparison for UFO reports submitted to MUFON, line style and configured as above.

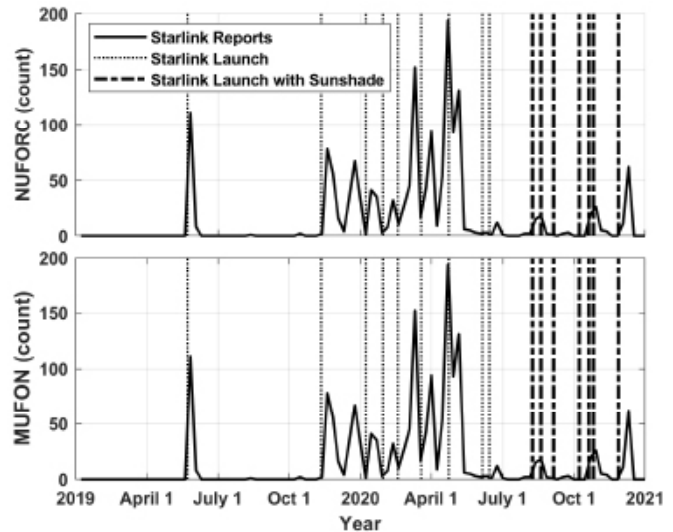


Figure 9. Weekly UFO reports identified as Starlink satellites. To highlight the effect of Starlink satellite launches on UFO reporting, we compare only the reports that are clearly Starlink satellites submitted to NUFORC (upper panel) and MUFON (lower panel). Starlink satellite launches are indicated with a vertical dotted or dashed line. The dashed vertical line indicates the satellites were launched with a sunshade to minimize reflected light (visibility). We note that the addition of the sunshade significantly decreased the number of Starlink satellites that are reported as UFOs.

and lockdown and health measures (aggregated by state); and b) time series of weekly UFO reports with lockdown and health measures across all fifty states. In both sets, correlations are presented including or excluding Starlink reports. Time series correlations, shown in Table 3, are calculated with either non-differenced or differenced values for comparison, with the latter creating stationary series. We expect these correlations to be positive if pandemic-related effects lead to more UFO reports, and in general correlations are above 0. However, most are small in size, between 0.0 and 0.3 in absolute value, and very few are significant at the conventional $p < 0.05$ level; further, we have not adjusted for the number of correlations, which would increase p values, or alternatively, use a lower p for significance. The highest correlation is -0.33 between all reports, including Starlink, and SARS-CoV-2 cases ($p = 0.03$), but this is moderate, at best, and importantly, is in the opposite direction of what is expected from theory, so that higher numbers of cases are associated with fewer reports.

For a visual comparison of pandemic-related measures to the report data with Starlink sightings removed, Figure

10 compares the weekly UFO reports submitted to NUFORC (upper panel), and MUFON (lower panel), with new weekly SARS-CoV-2 cases (dashed line) and new weekly deaths that were attributed to SARS-CoV-2 (grey line). Data are normalized to a range from 0 to 1 for each series. These time series remain generally uncorrelated. See Table 2. Figure 11 then displays the relationship between the Google CMR data and the UFO reports for NUFORC and MUFON, with Starlink reports removed. Again, the UFO report series are generally not correlated with the strength of the lockdown response.

We conclude by returning to the question that motivated this analysis: Did UFO reports increase during the pandemic? Table 4 presents the number of UFO reports without Starlink, and Starlink reports, with ambiguous reports that could not be coded removed, by year and organization. Since the pandemic did not begin in earnest until March 2020, we present results for the full year and then only the March through December period. There were a large number of Starlink reports even in 2019; in 2020 more than 20% (1194/5855) of reports to NUFORC were from Starlink, with a slightly higher percentage from

TABLE 3. Time-series analysis between total UFO reports and pandemic statistics (cases, deaths, excess time spent at home)

Time Series	NUFORC		MUFON	
	Statistic	P-Value	Statistic	P-Value
Starlink Filtered, Not Differenced				
All Reports vs Strength of Lockdown (National)	-0.05	0.75	0.05	0.75
All Reports vs Weekly SARS-CoV-2 Cases (National)	-0.26	0.08	-0.25	0.10
All Reports vs Weekly SARS-CoV-2 Deaths (National)	-0.14	0.35	-0.02	0.88
Starlink Filtered, Differenced, Confirmed Stationary (p < 0.001)				
All Reports Sightings vs Strength of Lockdown (National)	0.17	0.27	-0.22	0.15
All Reports Sightings vs Weekly SARS-CoV-2 Cases (National)	0.15	0.34	0.13	0.39
All Reports Sightings vs Weekly SARS-CoV-2 Deaths (National)	0.00	0.99	-0.02	0.89
With Starlink , Not Differenced				
All Reports vs Strength of Lockdown (National)	0.19	0.22	0.30	0.05
All Reports vs Weekly SARS-CoV-2 Cases (National)	-0.31	0.04	-0.33	0.03
All Reports vs Weekly SARS-CoV-2 Deaths (National)	0.03	0.83	0.09	0.57
With Starlink, Differenced, Confirmed Stationary (p<0.001)				
All Reports vs Strength of Lockdown (National)	0.00	1.00	-0.13	0.38
All Reports vs Weekly SARS-CoV-2 Cases (National)	0.10	0.49	0.09	0.57
All Reports vs Weekly SARS-CoV-2 Deaths (National)	0.05	0.073	0.01	0.95

TABLE 4. UFO reports and Starlink reports 2018–2020, for NUFORC and MUFON, by the complete year and March–December period. All reports exclude those that were too ambiguous to code as Starlink.

Year	NUFORC		MUFON	
	UFO Reports without Starlink	Starlink Reports	UFO Reports without Starlink	Starlink Reports
All Months				
2018	3058	0	4315	0
2019	4837	414	3734	150
2020	4651	1194	3716	663
P Value*	0.056		0.835	
March through December				
2018	2541	0	3661	0
2019	4349	414	3171	150
2020	3892	1010	3203	604
P Value*	<0.001		0.689	

*P values compare the sum of reports in 2019 to 2020, using a one-sample chi square test.

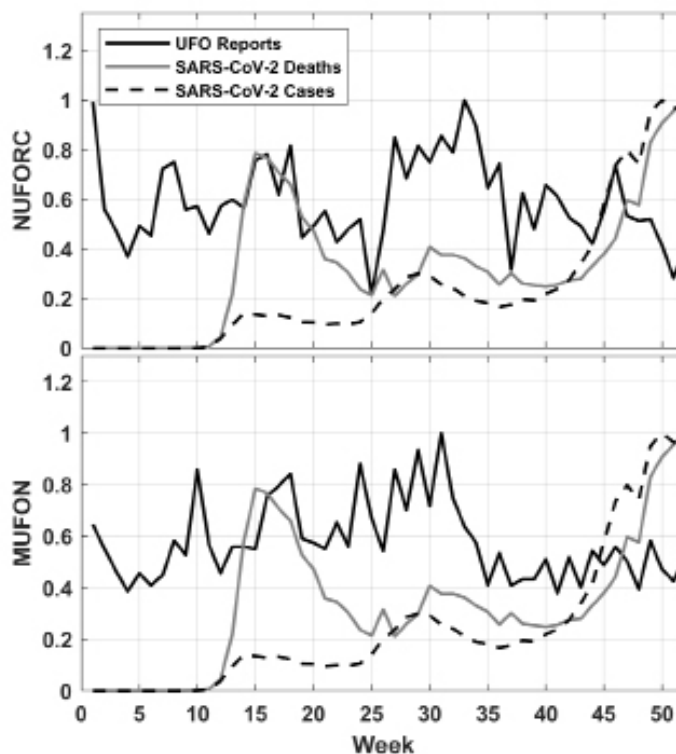


Figure 10. Comparison of UFO report counts with Starlink reports removed with measures of the SARS-CoV-2 pandemic. In parallel to Figure 5, (Upper panel): Weekly count of UFO reports submitted to NUFORC (black line), but with Starlink reports removed, is compared with the weekly count of new SARS-CoV-2 cases (dashed line) and deaths (grey line). (Lower panel): We compare the weekly count of UFO reports submitted to MUFON (black line), with Starlink reports removed, with new SARS-CoV-2 cases and deaths, line style as above. All metrics have been normalized by dividing the series by its maximum value, resulting in a measure that can vary from 0 (indicating a true zero) to 1 (indicating maximum value in that time period).

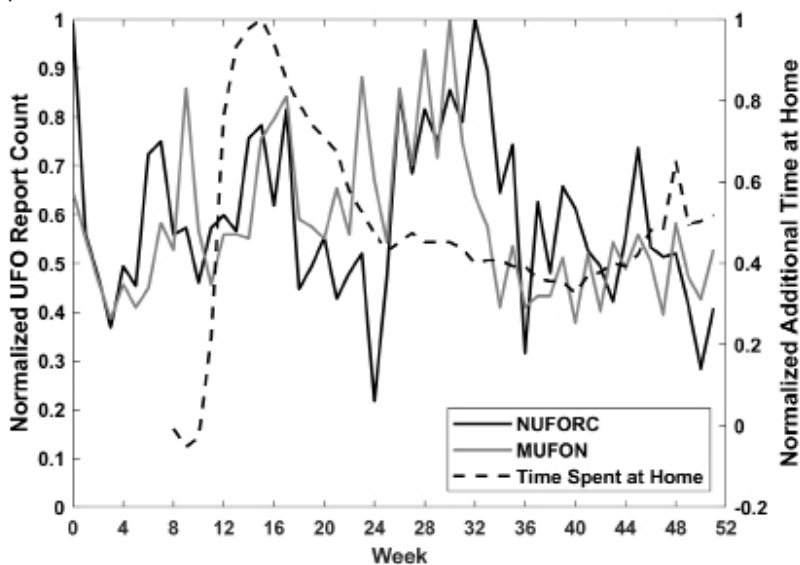


Figure 11. Comparison of UFO report counts with Starlink reports removed with additional time spent at home. The weekly count of UFO reports submitted to NUFORC, but with Starlink reports removed, are shown in black; the weekly count of UFO reports submitted to MUFON, with Starlink reports removed, is shown in grey; the additional time spent at home due to pandemic mitigation efforts, compared to a 6-week baseline measurement at the start of the year, is shown in the dashed line. UFO reports have been normalized by dividing the series by its maximum value, resulting in a measure that can vary from 0 (indicating a true zero) to 1 (indicating maximum value in that time period). CMR data are normalized to data from the previous year and so can have values below 0 or above 1. While the peak number of reports submitted to NUFORC and MUFON coincides with maximum additional time spent at home, these time series are generally uncorrelated in most of 2020.

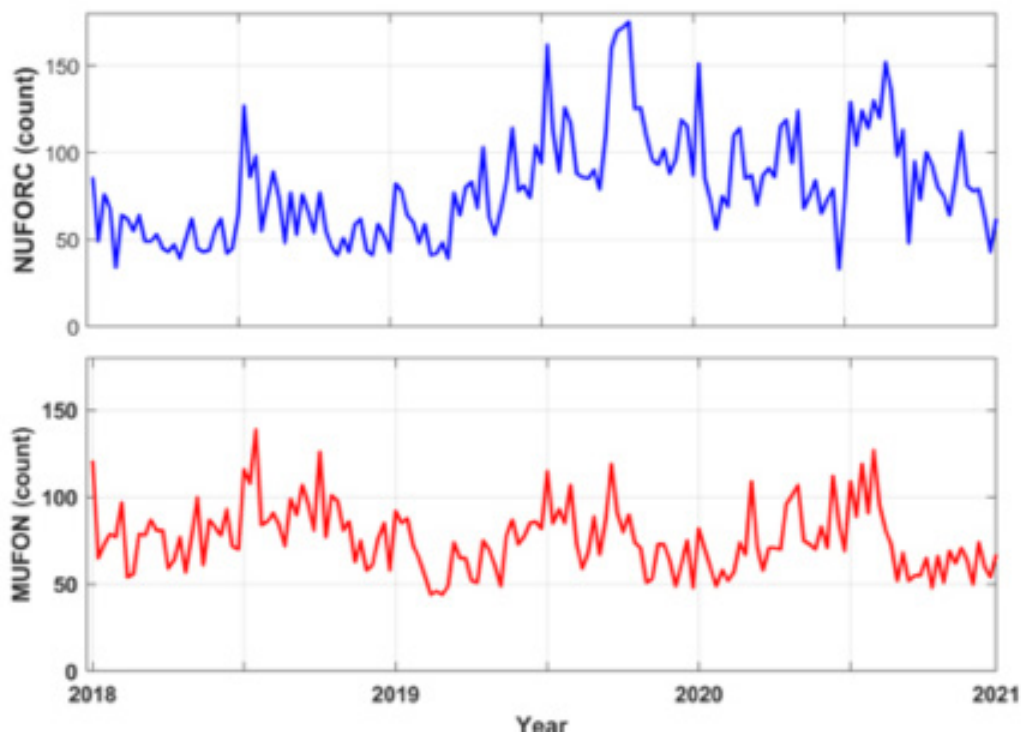


Figure 12. Time series of UFO reports with Starlink sightings removed. The weekly count of submitted UFO reports, with Starlink satellite reports filtered out, to NUFORC (upper panel) and MUFON (lower panel) from 1/1/2018 to 12/31/2020 is displayed. With Starlink sightings removed, there is no increase in UFO reporting in 2020 compared to 2019.

March through December. The percentage of reports to MUFON that were from Starlink was somewhat smaller (15.1% and 15.8%, respectively, in the two periods), but still very substantial. Once Starlink reports are removed, the number of reports in 2020 actually declined at NUFORC (4651 to 4837), although the difference is not significant ($p = 0.056$). The number of reports did decline March through December ($p < 0.01$). MUFON reports in 2020 were almost identical to 2019 in both periods ($p = 0.835$ and $p = 0.689$, respectively). Clearly, there was no increase in UFO reports in 2020 once Starlink sightings are taken into account. Figure 12 displays weekly UFO reports for NUFORC and MUFON for 2018 to 2020, with Starlink reports removed. It is evident that there was no effect of the pandemic on non-Starlink reports.

DISCUSSION

UFO sightings are known to have a number of causes, but making a report about a sighting is a social act. This understanding has led to hypotheses about what social factors can affect the number of reports, and prior research on this topic has found, at best, inconsistent effects of such factors as anxiety, economic problems, and media influences. Our model of UFO reporting suggests

that the SARS-CoV-2 pandemic was a natural experiment to investigate whether increased time at home, and generally increased anxiety and stress, was associated with an increase in UFO reports.

At a gross year-over-year level, UFO reports did increase in 2020 in both the NUFORC and MUFON databases. Our analysis of the correlation between the difference in the number of reports comparing 2019 to 2020 showed no association with standard measures of the lockdown response, or the number of cases and deaths caused by SARS-CoV-2. The pandemic affected everyone, and most people in the first year of the pandemic followed the news closely about public health, which led most stories with statistics on cases and deaths. The widespread lockdown effects of the pandemic, and the pandemic's medical outcomes, were not correlated with reports.

We also identified a unique new factor in UFO reporting, recognized by UFO organizations but not the public or media. Sightings of Starlink satellites became a substantial fraction of UFO reports beginning in 2019 and increasing rapidly in 2020. These reports support the factor in our model of UFO reporting that posits that an increase in visible phenomena will result in an increased number of reports. As we have noted, Starlink satellites are becoming an increasing hindrance to astronomical research, and they are also an annoying complication for the investigation of

UFO sightings. We coded all reports for Starlink sightings, and once these were removed the number of sightings in 2020 was not greater than in 2019. Also, filtered reports were not correlated with the various measures of the effect of the pandemic.

Although Starlink satellites were reported as UFOs—and perhaps understandably so—this very fact demonstrates that the public does accurately report what they see in the sky, even if they do not understand what they are viewing. Individual witnesses often were uncertain about the number of lights, the speed, or exact direction of a Starlink satellite train, but the essence of the information was observed, and reported. This basic accuracy is also why UFO organizations have long documented that 90–95% of reports can be identified; that would not be true if witnesses were misreporting critical details.

In total, our results do not support the various hypotheses that one or more social factors caused a change in the number of UFO reports. This finding is consistent with the limited past research (Kottmeyer, 1995) which has failed to find even a modest effect. UFO reports remain puzzling in many of their characteristics, extending even to the question of why their number waxes and wanes over time and location. The pandemic was a terrible disruption to normal life across the globe, but our analysis shows no effects on UFO reporting.

IMPLICATIONS AND APPLICATIONS

This study contributes to a long history of research designed to discover plausible associations of UFO reports with external effects or events. The pandemic offered a unique opportunity to do so and also to test hypotheses about what social influences affect the number of UFO reports. We are hopeful that our work will motivate others to continue and expand this type of research. Based on past work, and reasonable conjectures, associations with geophysical, geographic, astronomical, and meteorological data can be explored from the perspective of the physical sciences, while demographic, economic, sociological, and psychological data can be explored from the perspective of the social sciences.

There is evidence that ‘spiritual emergency’ is associated with paranormal experience, and pandemic-related stress could place people into this state and thus mediate the relationship with a UFO sighting. While we could not test this, it could be another interesting avenue of research (Storm & Goretzki, 2021).

Although for reasons of data quality and availability our study was restricted to reports from the United States, ideally statistical studies should be based on broader sets of UFO reports. This is more feasible as electronic databas-

es of reports become more available.

While we coded reports to determine whether Starlink was the source, we did not further distinguish between identified and unidentified reports for the analysis. It would be potentially useful to use data from MUFON, or other UFO organizations, which thoroughly investigate and classify sightings, to explore how the total set of identified or unidentified reports during the pandemic compare to the immediately preceding years.

ACKNOWLEDGMENTS

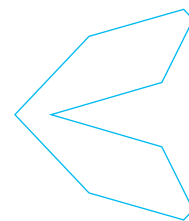
The authors thank Peter Davenport of NUFORC for making that reporting database freely available for research. We thank MUFON for making UFO reports from their CMS database available for this research, and specifically Sue and Rob Swiatek, who helped gain permission, and Tomas Karlsson, who extracted the relevant data for our use.

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**RESEARCH
ARTICLE**

The State of Continuing Qualitative Research on the Kennedy Assassination

John Delane Williams

HIGHLIGHTS

Contrary to the official narrative, a review of key evidence suggests that Lee Harvey Oswald actually attempted to stop the Kennedy Assassination rather than perpetuate it.

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ABSTRACT

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Followers of the Warren Commission's findings continue to accept Lee Harvey Oswald as the lone assassin of President Kennedy. Deniers of the Warren Commission's findings take a contrary view. This paper argues that Oswald was involved in the assassination, but this was an attempt to stop it. Oswald's life is explored, focusing on his military service in Japan until his own death. Particular emphasis is placed on (a) the writings Ernst Titovets (Oswald's time in Russia); (b) Judyth Baker (the summer of 1963 in New Orleans); (c) Dick Russell's writing of the experiences of Richard Case Nagell (in Atsugi Japan, 1957; and in Mexico City, New Orleans, and El Paso, 1963); and (d) Douglas Horne, on the medical evidence in the assassination. These writers collectively correct the record of Oswald's life. Baker showed Oswald's continuing relations with Jack Ruby and David Ferrie, persons supposedly unknown to Oswald. Baker clearly pointed out Oswald's involvement in the project that aimed to eliminate Fidel Castro with a bioweapon (i.e., a fast-acting cancer). Russell showed the importance of Richard Case Nagell with Oswald, and Horne elucidated the many missteps in the medical evidence in JFK's autopsy. During Lyndon Johnson's presidency (in 1965), a law was passed naming all materials involved in the JFK assassination were owned by the federal government. This development unfortunately serves to stifle any future forensic or quantitative research in the Kennedy assassination.

KEYWORDS

Kennedy assassination, Lee Harvey Oswald, conspiracy, qualitative research, witness psychology

INTRODUCTION

This article does not rehash issues as to how many shooters there were, their location(s), or how Jack Ruby was able to situate himself to subsequently kill the alleged lone sniper in the 1963 assassination of U.S. President John F. Kennedy. Nor will a recitation of all the possible shooters be addressed. The Warren Commission (1964) focused its attention on one person, and no other—Lee Harvey Oswald. Their focus was to present evidence that they saw as showing him to be the likely assassin. They accomplished

this by denying a defense to be the advocate for Oswald's side. A great deal of evidence has been produced over the years, though not necessarily widely circulated in the larger population. Evidence that would appear to exonerate Oswald is now available, but again not widely disseminated to the public. Some of that key evidence is displayed here. Oswald's life is explored with information from several different sources. The information itself often counters the Warren Commission findings, even if reference to refuting the Warren Commission is not explicitly made.

As many others who experienced the weekend of No-



vember 22, 1963, I was engrossed with events in Dallas and Washington D.C. I awaited the arrival of the Warren Report; I found the reported ballistics as probably incorrect. I went about finishing my doctorate in statistics and putting my emphasis in academic concerns. My own specific involvement in statistics was in linear models, using multiple linear regression. A book that demonstrates this approach is Williams (1996). I also received a second PhD in 1994 in clinical psychology, though my second dissertation was very much a complex quantitative study on aging and cognitive change over a 21-year period (Williams, 1991; Williams & Klug, 1996). I had begun to integrate both quantitative and qualitative research as a valid alternative to only using one approach. Though I had had very little published about the assassination of President Kennedy, I used his assassination as a way of combining the two research methodologies (Williams, 2001). At that point in time, I had not passed judgment as to what might be the accurate descriptor of the events of November 22, 1963.

Fellow JFK assassination researcher Judyth Baker was concerned that several other assassination researchers did not accept her claim of knowing Oswald well and that she had a relationship with him in the summer of 1963. Her critics generally claimed that she most likely did not know him well, their employment at Reily Coffee was merely coincidental, and her claim that they coordinated their applying to work there the same day was untrue. She asked me to use existing information from the want ads of the *New Orleans Picayune*, for the five days prior to the day they were both hired in 1963. As it turned out, the probability of them not knowing one another and thus not coordinating their efforts was 1.2 in a million. However, this outcome did not get too many people to change their beliefs (Williams & Cousins, 2005).

There are other quantitative reports regarding the assassination, but many of them consider the shot was presumably made by Lee Harvey Oswald, or a shooter from the sixth floor of the Texas School Book Depository (TSBD). An argument is made that Oswald was not on the sixth floor at the time of the assassination, rendering calculations from that site less relevant for those who are still trying to defend the Warren Report. One such study was completed by Nicholas Nalli (2018). His article is an excellent display of mathematics for addressing a hypothetical shot from the sixth floor of the TSBD, but it has no provenance regarding Oswald's having made the shot. There is no evidence placing Oswald on the sixth floor at the time of the assassination, but considerable evidence that places him on either the first or second floor for the critical time period. No calculations were made for any other location. In Nalli's article, the elapsed time was given as eight seconds; originally, it was given as six seconds. Thomas (2001) stud-

ied the impulses recorded on Dallas motorcycle policeman D. B. McLain's dicta-belt during the JFK motorcade on November 22, 1963. His analysis showed that one of the five impulses on the recording was consistent with a shot by a .30 caliber rifle from the Grassy Knoll. Thomas estimated that the probability that the Grassy Knoll shot was attributable to random noise was .037.

Most of the research efforts into the Kennedy assassination follows a qualitative approach, often using interview techniques with a particular witness. There are a few quantitative studies, but techniques used may be outside the technical understanding potential readers. An excellent example of using both qualitative and quantitative methods in researching the JFK assassination is the five volumes of Douglas Horne's (2009) *Inside the Records Review Board: The U.S. Government's Final Attempt to Reconcile the Conflicting Medical Evidence in the Assassination of JFK*.

Horne pointed out missteps in the processes used in the autopsy. The three military pathologists were stopped from tracing the bullets thru President Kennedy's body. Military brass present, including Rear Admiral George G. Burkley, President Kennedy's personal physician, yelled out instructions to the then young pathologists. Also loudly instructing the three pathologists was General Curtis LeMay, who made Herculean efforts to get to the JFK autopsy from an outpost in Canada, flying directly to Washington D.C. to the major civilian airport. He ignored the orders of the Secretary of Defense to fly to the military airport in the D.C. area, where he was supposed to be for the arrival of JFK's body.

Horne brings up several important points. Regarding the Zapruder film, two separate groups independently worked on "supposedly different" original 8 mm films. The two, non-overlapping crews worked at different times on the weekend following the assassination, at a secret CIA lab at the Kodak Headquarters in Rochester, New York. The Zapruder film was sold to *Time* magazine for \$50,000 for still picture rights. The next day, *Time* re-negotiated their contract with Zapruder for \$150,000, to include motion picture rights. During the period that *Time* held the rights to video, no attempt was made to either distribute the film or sell rights to distribute the film; apparently, their intent was to keep the film from ever being seen. A bootleg version of the film was shown on network television by Geraldo Rivera on March 6, 1975. The film had been shown on some local newscasts as early as 1969 in Los Angeles and in 1970 in Chicago. The source of these "leaks" were bootleg copies from a copy made available to District Attorney James Garrison when he was trying Clay Shaw for conspiracy in the assassination of John F. Kennedy. Garrison left the copy he had used in a trial for one of the volunteers assisting on the trial to make copies if he wished. Reportedly, the volunteer

made about 100 copies that night. Those copies and subsequent copies were used by researchers, including showing the film on college campuses. (My first viewing of the film was at the University of North Dakota in 1980).

The Horne volumes have many other notable reports. Two (or perhaps 3) separate brains were examined as if they were JFK's actual brain. His brain was missing half of its contents, due to the massive destruction. The reported weight of the brain was 1500 grams, a normal weight for an undamaged male brain. JFK's body was delivered twice to the Bethesda morgue, first at 6:35 p.m. At that time surgery was performed in the head area. A second arrival of the body occurred when Mrs. Kennedy arrived at 7:17 p.m. The crowd assembled for the first surgery was removed before the second arrival of the body. A second audience was assembled before the autopsy continued. This was for the "saving of appearances"; for those just arriving, they would think that nothing had taken place yet in the autopsy, and that the autopsy was just beginning. An observer who was there for the entire autopsy was Tom Robinson, a worker from the morgue who was there with a replacement coffin. The coffin JFK was placed in at the hospital in Dallas had a broken handle. Presumably, some of the military brass were also there for the entire proceedings.

Because Horne was mainly dealing with medical evidence, Lee Harvey Oswald is not considered until Volume 5, and there only briefly. Horne cited Sylvia Meagher (1976), who pointed out that paraffin tests were conducted on Oswald's hands and right cheek. The test was positive for his hands, but negative for his right cheek. Oswald may have fired a pistol, but he did not fire a rifle; the positive test for his hands could also be from the nitrates in the boxes he handled. The paraffin test for Oswald's cheeks of and by itself is proof that Oswald did not shoot a rifle, the purported type of weapon that killed President Kennedy.

Horne also cited George O'Toole (1975), who used a Psychological Stress Evaluator to determine stress levels in Oswald's voice from recordings of questions from reporters and Oswald's answers on November 22 and 24, 1963. Oswald most likely was telling the truth when he stated that he did not kill the President. The Horne volumes refute much of *The Warren Commission Report* (1964). Horne also took exception to their methodologies. He saw the Zapruder film as an altered film, even though the first group of researchers who examined it argued for its authenticity, perhaps so their research would not be invalidated.

FOLLOWING LEE HARVEY OSWALD

The publication of the *Warren Commission Report* took place in October 1964. They credited the assassination to Lee Harvey Oswald as a lone assassin. In reading that report

in 1964, my reaction was that they might have got most of the conclusions correct, but the ballistic results seemed to be somehow illogical. At that point and for many years to come, I accepted Oswald as the assassin. But my problem with the ballistics had not gone away. A trip to Dealey Plaza in 1980 further eroded for me the idea that Oswald was the lone assassin. An excellent marksman would view the task of shooting three accurate shots in under six seconds as quite difficult. But Oswald was *not* an excellent marksman. First, a short review of his life is made, including aspects of his life that are less well-known.

Oswald was born to a recent widow, Marguerite Clavier Pic Oswald. When Oswald was 3 years old, he was placed in the orphanage where his two older brothers had previously been placed. Marguerite would marry for a third time. Several moves would take place, first to Fort Worth, then back to the New Orleans area, then to New York, where Marguerite's oldest son lived with his new bride. In New York, Oswald would become a truant. On one occasion, the 13-year-old Oswald hitchhiked to Niagara Falls, where he encountered a border agent named Arthur Young. Oswald pleaded with Young to allow him to cross the border into Canada for a few hours. Young gave the thirteen-year-old explicit instructions to follow. Oswald followed those directions including returning by dusk. They would later go to lunch in New York, where Oswald reported that he wished to become a spy. Young and Oswald had a significant encounter in New Orleans in 1963 (Baker, 2010, pp. 352–353).

Oswald and his mother returned to New Orleans, leaving behind his difficulties with the trancies in New York. In New Orleans, Oswald joined the Civil Air Patrol (CAP), and had as his instructor Captain David Ferrie. On one occasion, Oswald was at Ferrie's house, and Ferrie locked himself in a room with Oswald. Oswald feared he was in danger; Oswald broke a window and took a shard of glass and pointed it at Ferrie. A fight ensued and Oswald was badly beaten. After smashing Oswald in the mouth, Ferrie remembered that Oswald's uncle was a significant member of the local Mafia. Ferrie begged Oswald not to tell anyone. Oswald said he was not a snitch, but he did not want to see Ferrie again (Baker, 2010, pp. 42–45). Oswald quit going to CAP, but returned when he heard Ferrie was no longer with CAP. Later, Ferrie resumed his CAP duties. A picture with both Oswald and Ferrie was taken in August 1955 at a CAP bivouac (Grodin, 1995, p. 20). In the Warren Commission's view, Oswald and Ferrie did not know each other. This picture proves otherwise. For years defenders of the Warren Commission denied any relationship between Ferrie and Oswald. As will be seen later, they worked together in the Summer of 1963 as well.

Oswald and his mother moved back to Fort Worth, where Oswald re-enrolled in high school (though he sel-

dom attended). At 16, he attempted to join the armed services by claiming to be 17. Failing in that quest, he finally enlisted in the Marines shortly after his 17th birthday. His time in the Marines was noteworthy. Early on in military service, Oswald established his lack of marksmanship with a rifle, but finally achieved the minimum to finish basic training. Then he took Advanced Infantry Training. He was then sent to Jacksonville, Florida, to the Naval Air Technical Center where Oswald was taught radar theory and map reading, after which he was promoted to Private First Class (PFC). Next was a course in Aircraft Control and Warning at Keesler Air Force Base in Biloxi, Mississippi. He finished 7th in a Class of 30. He was then sent to the Marine Air Station in El Toro, California, as a replacement trainee. His training resulted in him being classified as a radar operator; considering Oswald dropped out of high school at the beginning of 10th grade, this was a somewhat surprising achievement (Grodin, 1995, pp. 25–26).

His next assignment was to the Marine Air Control Squadron 1 in Atsugi, Japan. This facility was the most sensitive intelligence unit of the United States in the Pacific. The Station had a large CIA involvement present. Oswald went to the Queen Bee, a bar in Tokyo, which catered to men who had considerable money to spend, particularly if they were interested in dating one of the beautiful women there. A date could cost \$100, well beyond Oswald's pay as a PFC. Yet he met a beautiful Eurasian woman, who was trying to pry information out of Oswald. When getting back to the base he immediately informed his supervisor, who suggested that Oswald continue to see the woman, apparently with sufficient money provided to keep the relationship viable. Oswald was instructed to give her misinformation. Oswald would fall in love with his Queen Bee escort. At this point, Oswald was still 17 years old and having seeming success in the military, getting to become involved with work similar to a spy, and in love with a beautiful woman. It would not last.

Also at the Queen Bee, Oswald met Richard Case Nagell, who apparently was assigned to the Atsugi installation as well. Nagell would play an important role for Oswald. Very likely Nagell was the CIA contact who recruited Oswald to go to the Soviet Union. The remainder of Oswald's time in Japan would sour for Oswald. His girlfriend took up with another Marine. Oswald would find troubles with literally shooting himself in the foot, and then pouring beer on his competition for the beautiful Eurasian girl. These offenses resulted in a court martial for Oswald.

Oswald returned to the United States and was again stationed at the El Toro Base. A woman flew in from New York, ostensibly to see Oswald and his Commanding Officer, Lt. John Donovan. The woman, Rosaleen Quinn, the aunt of one of Oswald's Marine acquaintances at El Toro,

had taken a Berlitz Course studying Russian, and was going into the U.S. Foreign Service. She had heard from her nephew about a person in his unit who seemed to have considerable mastery of the Russian language. She might have had just as much interest in Lt. Donovan, who was leaving the Marines, also to enter the U.S. Foreign Service. Quinn was dazzled by Oswald's command of the Russian language. Seemingly, his display of comprehension of spoken Russian perhaps enhanced his sense of being successful in Russian. If so, he would be profoundly disappointed when he arrived in the Soviet Union (Parker & Purcell, 2020).

Theory of John Armstrong. Before proceeding with Oswald in Russia, it is useful to introduce a theory about Oswald from John Armstrong. A quick summary of Armstrong's theory is that a young male, born in a Russian-speaking area in Eastern Europe, immigrated to the United States. At some point this young man subsumed Lee Harvey Oswald's identity. The false Oswald is referred to as Harvey, and Lee Harvey Oswald would be called Lee in Armstrong's theory. The so-called actual Lee Oswald is not prominent in Armstrong's theory, though he may have been active in Dallas. Armstrong posited that Oswald's remarkable learning of Russian was because he was a native speaker of Russian from a Soviet bloc region. Further, Armstrong posited that, "Oswald had to be suspicious of everyone around him, including Marina and the Zigers, and would never have dared to speak Russian. In fact, no one ever said he did, except Marina" (Armstrong, 2003, p. 340).

Gary Severson and I met at a JFK assassination Conference in Minneapolis. One of the main speakers was John Armstrong. Gary made inroads with Armstrong and his entourage, and we were asked to go to Stanley, North Dakota, to interview a Russian-speaking woman who ostensibly was to help this young man to get his Russian back to where it was in his homeland. Gary and I went to Stanley, North Dakota, to interview her. On going to her front door, there was no indication of any occupation of the house. We interviewed one of her neighbors. We were told the neighbor had not seen the woman for several months. She did indicate that the woman was reclusive.

I had one other assignment from the Armstrong contingent; I was to check records of driver's licenses in the names of two possible aliases supposedly used by the substitute Oswald in the state of North Dakota; the names were Don (Donald) Norton and Charles Bair. I received the following reply from Marsha M. Lembke, Director, Driver's License and Driver Safety, North Dakota Department of Transportation. Her letter stated, "A search of Drivers License and Traffic Safety records indicate that no licenses were ever issued to Don (Donald) Norton, nor to a Charles Bair." Over two weekends, we interviewed several residents about a possible Oswald visit to Stanley, in the Sum-

mers of 1954 and/or 1955, which led us to writing two articles about our Stanley experience (Williams & Severson, 2000a,b).

Oswald's Russian Experience. Oswald's experience in Russia (then the Soviet Union) was brought to American readers by Priscilla Johnson McMillan (1977). McMillan interviewed Oswald's wife, Marina Oswald, several times. She had visited with Lee Harvey Oswald in the Soviet Union in 1959, shortly after he had defected there. Arguably, she had little information about Oswald except through Marina's lens. The writing of Ernst Titovets (2010) gives a very different perspective from McMillan's.

The first part of Oswald's Russian Experience seems to be relatively well-known. In Moscow he went to the American Embassy, attempting to renounce his citizenship; this part was heard by the Soviets, who were bugging the American embassy. By not returning to the Embassy, Oswald retained his right to eventually return to the United States. Oswald applied for Soviet citizenship, which was denied. He gave the appearance of attempting suicide, was taken to a hospital, and was given a temporary residence permit and was sent to Minsk. He was given an apartment and a job at a radio factory. His salary was 1400 rubles a month, above other workers and approximately equal to the supervisor in the factory. Oswald's lament is that he had nowhere to spend the money. It was deemed that Oswald needed significant tutoring to help his dismal abilities in spoken Russian; the local Communist party assigned a person to give him instruction in the language. If Oswald had the impression he was proficient in Russian, the persons he interacted with saw his language skills as inadequate. He was helped also by in-tourist guides. One in-tourist guide mused, just before Oswald was married, "How could they communicate?" Perhaps this was an example of the native Russian speakers noticing that Oswald was *not* a native speaker.

Oswald had been friendly with a department manager at the radio factory, Donald Ziger, who emigrated to Russia from Argentina. Ziger was fluent in Polish, Spanish, Russian, and English. He invited Oswald to his apartment many times. Ziger had two daughters near Oswald's age, Eleanora and Anita, whom Oswald would spend much of his time with when at the Zigers. On one occasion in late September 1960, Ernst Titovets also visited the Ziger household. The two young men left together and agreed to get together at Oswald's apartment a few nights later. Titovets presumed Oswald was an educated person; he seemed to enjoy classical music, his apartment appeared to be that of a higher-level employee. His fluency in Russian seemed adequate; when they were together with no one else present they would speak English, at Titovets' request; Oswald was the first native American speaker Titovets encountered and he wished to improve his spoken English. However, if

even one person in a group did not speak English, everyone would use Russian. Oswald and Titovets would attend concerts or operas or plays and motion pictures together. Oswald would often pay for both of their admissions. They would also go to see university girls in their dorms.

It should be clear that Armstrong was wrong in his belief that Oswald never spoke Russian in the Soviet Union. To this point, the Communist Party even appointed a person to provide instruction in Russian to Oswald.

Ella German was a girl who attracted Oswald's attention shortly after he began work at the radio factory. She had friends who worked at the radio factory. Oswald and German began with taking walks together. Their "romance" was definitely on the slow side. Yet Oswald seemed smitten by her. On New Year's Eve 1960, her parents invited him to their family party; Oswald met her parents for the first time. The evening was very satisfying to Oswald. Oswald decided to propose to Ella German. Two days later, they went to the cinema. When they got back to her doorstep, Oswald proposed. After hesitating, Ella said, "No." She explained that his being an American could be a potential problem, he might be arrested just because he was an American. Oswald's hastening of the proposal might have been related to a decision that had to be made soon. Oswald had to decide on whether he wanted to formally seek Soviet citizenship again, or if he wanted to return to the United States. Perhaps if she consented to marry him, he might have chosen to seek Soviet citizenship. Two days later he stopped seeking Soviet citizenship.

Oswald Meets Marina Prusakova. On March 17, 1961, Oswald and Titovets attended a lecture by Lydia Cherkasova, a higher-level Communist Party member. Titovets was more interested in going to the dance in a different part of the hall. After the lecture, Oswald joined Titovets at the dance. There he saw an attractive girl who was surrounded by several suitors. Oswald went up to her and asked for a dance. Titovets noted that several of her suitors had previously had relations with her. Oswald walked Marina home. It was Titovets' view that Oswald was beginning to court Marina to make Ella German jealous. Marina had worked as a pharmacy assistant in St. Petersburg, but had been expelled to Minsk for prostitution. After a short courtship, Oswald and Marina were married. Their first child would be born before they left the Soviet Union for the United States (Titovets, 2010, pp. 240–260). The Oswalds arrived at Hoboken, New Jersey, on June 13, 1962 (CE 279, 260–261). They moved to Dallas. Their relationship there was tumultuous. Oswald did hold at least one interesting job, at Jaggers-Stiles-Stovall, a graphics arts company. Among other things, they were doing classified work, including making maps of Cuba. This was only weeks before the Cuban missile crisis.

New Orleans. Oswald returned alone to New Orleans on April 24, 1963. Marina was to join him later. On April 26, Oswald went to the post office. As he was standing in line, a young lady in front of him in line dropped some papers. Oswald picked up the papers and handed them to her. In Russian, she said, "Thank you." Oswald responded to her in Russian, "You're welcome. It's dangerous to speak Russian in New Orleans" (Baker, 2010, p. 113). They then sat on a bench together and learned about each other. The young lady was Judyth Vary and she was in New Orleans for an internship with Dr. Mary Sherman. Oswald said he could introduce her to several people, including Dr. David Ferrie, a cancer researcher, who worked with Dr. Sherman. Ferrie is the same person who was an instructor in CAP who had been one of Oswald's teachers. The project employed Oswald, Ferrie, and Judyth Vary Baker; Judyth married her fiancé Robert Baker on May 2, 1963, in Mobile, Alabama, when Robert Baker had a chance to have time off from his job working on a drilling operation in the Gulf of Mexico (Baker, 2010, pp. 189–195).

THE PROJECT TO ASSASSINATE FIDEL CASTRO

The project that Oswald and Judyth Vary Baker as well as David Ferrie would be working on was secretly funded by a government agency that could skirt ordinary procedures; the funding most likely was from the CIA. The aim of the project was to produce a biological specimen that could be injected into a human and be a fast-acting cancer that within weeks would kill the intended target—the intended target was Fidel Castro, the head of the Cuban government. Castro had ruffled too many feathers after removing the dictator, Fulgencio Batista. Castro eliminated prostitution, closed most of the casinos, and imprisoned many of the people profiting from these enterprises. He had also aligned his country with the Soviet Union and received massive aid. Judyth had as a high school student developed fast-acting cancers in mice. Oswald's role during the project was carrying specimens from Ferrie to Dr. Sherman. Ferrie would take already cancerous mice, send them to Dr. Sherman, and she would take the most potent cancers and inject them into a new group of mice. Several iterations of this process took place. Judyth served as the lab assistant to Dr. Sherman. When a satisfactory biological product was achieved, it would be tried out on available subject(s). When it was successful, Oswald would take the specimen to a particular store in Mexico City and a handoff would be made to a Cuban medical worker (Baker, 2010).

Along the way, Baker met several notable persons; first there was Jack Ruby, though he was introduced to Judyth as "Sparky Rubenstein." When Oswald first moved to

Ft. Worth, Oswald's uncle Dutz Murret asked Ruby, who lived in Dallas, to "Watch over my boy, Lee." Both Murret and Ruby had allegiance to Carlos Marcello, the Mafia boss in New Orleans; Dallas was in the Mafia jurisdiction of New Orleans. Ruby also had provided financial support to the "Project," and he was aware that they intended to eliminate Castro with a fast-acting cancer. Others who Oswald introduced Judyth to included Guy Banister (Baker, 2010, pp. 171–175) and Dr. Alton Ochsner. Oswald preceded Judyth in having an interview with Dr. Ochsner; Dr. Ochsner discussed with Judyth her role in the project. She would be enrolling at Tulane University to attend medical school in the Fall. Yet another person that Oswald would introduce Judyth to was Arthur Young, who was in New Orleans for one day to process Oswald for a passport to Mexico (and whomever else appeared that day to get passports). This was the same man who allowed Oswald to cross the border into Canada ten years previously. The passports would be available the next day. It should be pointed out that very few prior publications address information about Oswald knowing Jack Ruby or David Ferrie, or that Oswald introduced them to other persons.

Oswald and Judyth Baker. Judyth Vary Baker (2010) described her time with Oswald, including their plans for the future. Initially they knew they were each married, but they still fell in love. They began an intimate relationship, with the intent of getting together in Mexico after the current issue (the getting rid of Castro and avoiding an assassination of President Kennedy) was done. Arguably, their plans had a low probability of success.

Jackson, Louisiana. The occurrence of Oswald being in Jackson, Louisiana, has puzzled several persons following the evidence regarding persons connected to the Kennedy assassination. In a black Cadillac, David Ferrie, Lee Harvey Oswald, Clay Bertrand/Shaw, and a hospital orderly from Jackson State Hospital were waiting near a phone booth for a call informing them that the volunteer(s) would soon be arriving. The volunteer(s) were to be injected by the "fast acting cancer" developed through Dr. Ochsner's research project. Later, Judyth was sent to check on the patient(s). As Judyth checked the patient(s), she became aware that multiple prison "volunteers" were injected with the fast-acting cancer that she helped develop. She wrote a note to Dr. Ochsner, which stated, "*Injecting disease-causing materials into an unwitting subject who does not have a disease is unethical*" (Baker, 2010, p. 470). As Judyth was aware, this note ended everything in her presumed medical future. She was fired from the job with the project, she would not be going to medical school at Tulane, but she was still required to test the subjects at Jackson State Hospital one last time. Oswald was told he should not contact Judyth ever again by Dr. Ochsner. Oswald would speak to

her on the phone several times after she returned to the University of Florida. Once she left New Orleans a few days later, they would never see each other again (Baker, 2010, pp. 470–475).

It would be remiss of me to not address the intense criticisms of Judyth Baker as a reliable witness. Specifically, she has been accused of not knowing (or not knowing well or not having a relationship with) Lee Harvey Oswald. It has also been claimed that Oswald and David Ferrie did not know each other; we know that claim was proved false by a picture showing the two together at a bivouac when Oswald was in the Civil Air Patrol. Baker also claims that Oswald and Ferrie worked together on the “Get Castro” project in the Summer of 1963. As to the relationship between Oswald and Baker, we, of course, do not have any documentation from Oswald about the relationship; we do not know if their planned get-together after successfully saving President Kennedy from an assassination attempt had been agreed to by both of them. Neither President Kennedy nor Lee Oswald survived the weekend.

Judyth in her reporting tells us what she knows from her personal experience, and what she thinks she knows from what others told her. The latter communications from others need to be fact-checked. Her own experiences are subject to her own interpretation of events. With these caveats in mind, it is my opinion that she has tried to be honest in her accounts. She is steadfast in her belief that Oswald was attempting to stop the assassination of President Kennedy. She is criticized for not revealing her experiences in the Summer–Fall of 1963 until sometime after her divorce from her husband. One can disagree with her timing, but she finally revealed it in 1999, the same year that the author became aware of her, and we began correspondence then.

Also, another researcher has addressed the issue of her veracity in his most recent book. Edward Haslam (1995) had written an earlier book that gave him credence as a New Orleans based researcher who was contacted by producers of the CBS news show *60 Minutes* regarding his assessment of Baker. Years earlier, he had met a woman using that name who had left a poor impression but he found out later she was not the same person who is now known within the JFK research community. He was told that the missing ingredient in his first book was a lack of a witness. Interviews with Baker convinced him that Baker was that witness. Haslam’s (2007, p. 328) view is “She has been treated disgracefully in Internet news groups and subjected to insults from people hoping to humiliate her back into silence.”

Richard Case Nagell. Though Richard Case Nagell and Lee Harvey Oswald had last met up in Atsugi, Japan, they would have encounters in July, August, and September

1963. The reasons for these meetings appear to be Nagell’s wanting to determine, according to the wishes of the Soviet KGB, would Nagell murder Oswald? Nagell had been “loaned” to the Soviets by the CIA. The Russian interest was, were there an assassination of President Kennedy, the Russians would be able to avoid any implications that Oswald had been involved in the assassination at the behest of the Soviet Union. Nagell had already determined he would not perform the killing in the United States. The CIA was not authorized to commit felonies on U.S. territory. The question for Nagell was, would he do it outside the United States?

The first get-together of the two was in Mexico City between July 23 and July 27 at the Luma Hotel. Oswald also reportedly went to the Cuban Embassy in Mexico City. No reason was stated for this trip, but Nagell and Oswald went where they could shoot guns at some cacti. Nagell’s assessment was that “Oswald couldn’t hit the side of a barn” (Russell, 2003, p. 237–241). The second meeting was said to have taken place in “Houston.” Nagell told Russell that the meeting was neither in Houston nor Texas. At the meeting were Nagell, Oswald, “Angel,” and a fourth unidentified person. This meeting occurred in the time period August 23–27, 1963. The meeting was about the assassination of President Kennedy. The meeting began in Spanish, with Nagell translating for Oswald, and then turned to English. The name of Sergio Arcacha Smith came up. Raul was also mentioned. Raul was a cover name allegedly used by David Atlee Phillips (Russell, 2003, p. 275).

The September 7, 1963, Meeting of Oswald, Phillips, and Antonio Veciana. For much of the time in September, Oswald was waiting for the outcome of the injections to the prisoner “volunteers.” Oswald did meet with David Atlee Phillips together with Antonio Veciana, on September 7. Much of that meeting was observed by two teenagers, Wynne Johnson and his girlfriend, Vicki, though Wynne only became aware of the identities of two of the participants (Phillips and Veciana) in 2014. The teenagers observed the younger person (Oswald) arrive in a taxi. The two teenagers walked to the Southland Center, adjacent to where the younger man was dropped off. The teenagers planned to go to the observation deck of the 42-story Dallas skyscraper. Inside the building, when they reached the lobby, the youngest man and two others were talking. The older man (Phillips) turned to the two teenagers and asked, “Excuse me, can you tell me if there is a coffee shop around here?” Vicki answered by telling him about a coffee shop they saw on their way to the Southland Center.

As that conversation appeared to be ending, Oswald said to Phillips, “He seemed to recognize me.” Vicki immediately replied to Oswald, “We saw you outside.” Then, Phillips said, “I thought he was on our side.” Oswald quipped,

"That's what you're going to find out." Phillips asked Vicki, "Does he (Wynne) have a camera?" Vicki stated, "No." (Wynne did have a camera in his pocket, but he had not taken any pictures.) The two teenagers then continued on toward the observation deck elevator. Vicki suddenly decided to go back into the lobby. As Wynne recalls, when Vicki returned, she stated that the younger man was "Lee Harvey Oswald," whom Wynne had heard on the radio of the rebroadcast of a program in New Orleans in August, but without committing the name to memory. The two teenagers went to the observation deck, their original intention (emails from Wynne Johnson, 4/25/2021; 5/3/2021, Johnson, 2021 a,b). Shortly thereafter, Oswald was sent back to New Orleans without getting invited to lunch with Phillips and Veciana (Williams, 2019, pp. 127–128).

The Third and Decisive Meeting with Richard Case Nagell. The third meeting took place between Oswald and Nagell on or before September 17, 1963, in New Orleans. "Laredo" (a code name for Nagell) called for the meeting. Presumably, he wanted to know what Oswald was doing, before he made a decision as to what he would do with Oswald. We do not know precisely what Nagell and Oswald spoke about in New Orleans; Nagell reported that Oswald denied involvement with plots against President Kennedy. Nagell also reported criticizing Oswald for attempting to interfere with the revolution in Cuba. What we do know is that Oswald was directed to get a 15-day visa to Mexico, which Oswald applied for on September 17 (Russell, 2003, p. 288). Nagell entered the conversation with the possibility of killing Oswald in Mexico; his decision was to not only not kill Oswald, but Nagell also would deliberately commit a crime a few days later, guaranteeing that he would be in jail/prison when Oswald was in Mexico, and if President Kennedy would be assassinated, Nagell would be in jail/prison at that time. Also, Nagell would send Oswald \$500 and a plane ticket to get to Mexico (Russell, 2003, p. 290). This would suggest that Nagell supported Oswald's assignment in Mexico. One might consider that Oswald gave some information to Nagell about his efforts in New Orleans, and his role in delivering the bioweapon for the elimination of Fidel Castro, hopefully thereby ending planning for the assassination of President John F. Kennedy.

Nagell in El Paso, September 20, 1963. On September 20, 1963, Nagell drove around the streets of El Paso, perhaps trying to decide exactly what he would do. Nagell parked his Ford Fairlane in an alley near the post office, by a "no parking" sign. He had written three letters, one to Desmond Fitzgerald, then Chief of the CIA Cuban Task Force, and previously, from 1957–1962, Chief of the CIA Far East Division. A second, and nastier letter went to an unnamed CIA official at the Langley Headquarters; the third letter was to Lee Harvey Oswald, which contained five \$100 bills,

and an airline ticket to Mexico City. Later, Nagell indicated that the FBI was aware of this letter. In the week prior to this, Nagell had sent a letter to FBI Director J. Edgar Hoover, warning him of a planned assassination against President Kennedy. In a letter written in 1974 to lawyer Bernard Fensterwald, Jr., in replying to Fensterwald's question, "Why did Oswald take the bus to Mexico City, instead of the plane to Mexico in an effort to 'make a few bucks?'" Nagell responded that he had "... cause to believe that he (Oswald) was never given, or did not receive, the five hundred dollars" (Russell, 2003, p. 290).

Nagell mailed the three letters at the downtown post office. Nagell then walked across the street to the State National Bank and shot two bullets into the wall. In that Nagell had threatened no one and did not attempt to rob the bank, he presumed that he would be charged with only a misdemeanor. He then casually left the bank, went to his car, and waited to be arrested. Finally, a young policeman, James Bundren, arrived and asked, "Why did you try to rob a bank?" Nagell replied, "I didn't know there had been a robbery." Nagell left several clues about what he was doing; he said his actions would "... keep anyone from following me." Nagell also stated, "All my problems have been solved for a long time, and now I won't have to go back to Cuba" (Russell, 2003, pp. 291–292). Nagell would be right about his last statement. However, instead of being charged with a misdemeanor, Nagell found that firing a gun in a bank was a felony. He was to spend several years in prison. Finally, Nagell was released from Leavenworth Prison on April 29, 1968.

In re-addressing the meeting in New Orleans between Oswald and Nagell, recall that Nagell was deciding what he might do with regard to Oswald, in that he had been given the assignment of eliminating Oswald, which Nagell would only consider outside the United States, if at all. We know that Nagell not only removed himself from having any possibility of eliminating Oswald, we can infer from Nagell's castigating Oswald for being involved with a plot against Castro, and yet attempting to fund Oswald's trip to Mexico, that, all things considered, given the direction that Oswald might go, trying to avoid the assassination of President Kennedy was preferable to saving Castro, if those were the only choices available (Williams, 2020).

Outcome of the New Orleans Fast-Acting Cancer Project. The ultimate outcome of the project was the building of a biological weapon that appeared to meet the expectations for it. The weapon did not however, get used on its primary target, Fidel Castro, as Lee Harvey Oswald was not able to successfully hand over the weapon to a Cuban medical technician, who never arrived in Mexico City. Apparently, the hurricane season kept the Cubans responsible for their co-ordination with the project from fulfilling

their duties. But, there is an even more sobering outcome; the CIA now had a terribly destructive cancer that could be used at their discretion (or lack thereof). It so happened that Jack Ruby died of cancer within weeks of winning his appeal for a new trial for the murder of Oswald. Ruby claimed he had cancer cells injected into him.

OSWALD AND THE JFK ASSASSINATION

Oswald Warns the FBI. On November 16, 1963, Oswald contacted an FBI agent regarding the impending assassination of President Kennedy. A telegram was constructed and sent (probably to national FBI Headquarters). The next day the telegram was sent to relevant FBI offices (Figure 1), including the New Orleans office. At the time that the Assassination Records Review Board was Operational (1990s), Marina Oswald wrote to the Board Chairman “I now believe that my former husband met with the Dallas FBI on November 16, 1963, and provided information on which this telegram was based” (Baker, 2010, p. 516). This document shown in Figure 1 has been published by several authors, including Williams (2004).

Oswald’s Whereabouts Prior to the Assassination. At 11:45 a.m. on November 22, 1963, Oswald was at his work assignment on the sixth floor. When fellow employee Charles Gibbons was asked by police, he responded that Oswald was in the Domino Room at 11:50 a.m. on the first floor reading a newspaper. Bill Shelly, foreman at the Texas School Book Depository, saw Oswald shortly before noon. Another employee, Eddie Piper, talked to Oswald at noon on the first floor. Oswald apparently went to the second floor and purchased a soda, returned to the first floor, and began eating his lunch; another employee, Harold Newman, was eating his lunch at the same time. Carolyn Arnold, a secretary at the Texas School Book Depository, observed Oswald in the Domino Room at 12:15. Carolyn Arnold stayed in the Domino Room until 12:25 (Ernst, 2013). There is some evidence that places Oswald in the doorway at the entrance of the Texas School Book Depository just prior to the time of the assassination (Dane, 2015; Rivera, 2018, pp. 242–257). As the shots rang out during the assassination (12:30 p.m.), Oswald was getting change in the office of a secretary, Jeraldean Reid (Grodin, 2020, 2013).

Oswald’s Whereabouts Immediately After the Assassination. From the work of Barry Ernst, (2013), we know that Oswald was not on the sixth floor at the time of the assassination. Dorothy Ann Garner, Elsie Dorman, Victoria Adams, and Sandra Styles were watching the motorcade from Dorothy Ann Garner’s office window. Gorman was filming the motorcade from the window. Shortly after the 12:30 assassination (90 seconds later), motorcycle Officer Marion Baker and Building Superintendent Roy Truly

encountered Oswald on the second floor. Shortly after his encounter with Officer Baker and Superintendent Truly, Oswald left the building.

After the shooting, Garner sat between the stairs and elevator, and could see both ways with no obstacles interfering with her vision. Garner stayed there for several minutes, well after Oswald left the building. Adams and Styles began descending the stairs and proceeded to exit the building in the rear entry. Oswald would board a bus, which became caught in traffic, then took a cab to his boarding house. Upon leaving the boarding house, we know that Oswald went to the Texas Theater, where he was apprehended by the Dallas police. Oswald would later be charged with the murder of Officer J. D. Tippit. One curious point is that there were three wallets involved for Oswald on that day. He left a wallet for Marina in their room at Ruth Paine’s home. A second wallet with contents that appeared to belong to Oswald (though it may have been a deliberate drop) was found at the scene of the killing of J. D. Tippit. A third wallet was in Oswald’s possession at the time of his arrest. It would seem strange that 1) Oswald would have three wallets; 2) he would be carrying two wallets that day (Baker & Schwartz, 2017, p. 50).

Verdict on Oswald. Did Oswald shoot President Kennedy? The answer from the totality of qualitative information available seems very clear—Oswald did *not* shoot President Kennedy. There is no further reason to consider him as a possible shooter. So, what was Oswald’s role in the assassination of President Kennedy? Most likely, Oswald was what he said he was, a “patsy,” though probably not the only one. It appears he had other roles, which includes seemingly trying to stop the assassination.

ALBARELLI’S RESEARCH

H. P. Albarelli’s (2021) final book, *Coup in Dallas: The Decisive Investigation into Who Killed JFK* is best described as a research process that begins its story much earlier than most attempts to address the crime of the twentieth century, going back to the Roosevelt administration. The research is an important contribution, but it is arguably not definitive, only suggestive. Albarelli has written two previous books that may be of interest to JFK assassination researchers. *A Terrible Mistake: The Murder of Frank Olson and the CIA’s Secret Cold War Experiments* (2009) describes misguided military research of lysergic acid diethylamide (LSD) that clearly violates the rights of unsuspecting subjects of that research. In the case of Frank Olson, it cost his life.

His second book, *A Secret Order: Investigating the High Strangeness and Synchronicity in the JFK Assassination* (Albarelli, 2013) does in fact have several examples of very un-

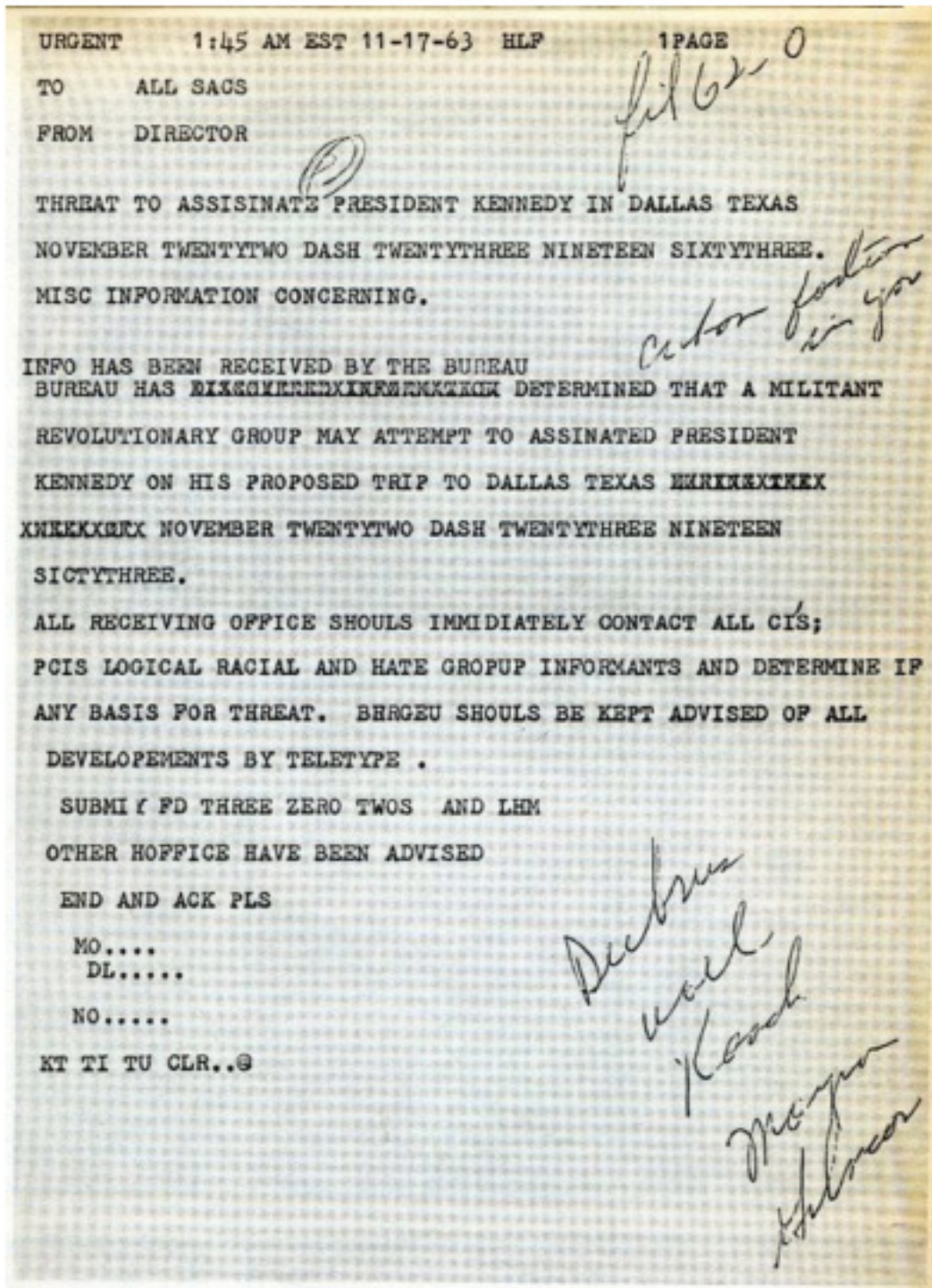


Figure 1. Telegram sent to FBI offices from FBI headquarters on November 17, 1963.

usual circumstances. One such strange circumstance (also summarized in Williams, 2019, pp. 273–275), occurred with a young scientist, Adelle Edisen. She was a post-doctoral fellow with the National Institute of Neurological Diseases and Blindness. Her contact person at the Institute was Dr. Jose Rivera. Edisen was meeting with Rivera in April 1963. At a dinner meeting, Rivera told Edisen that, “When you would go to Dallas, you should go to the Carousel Club because it is a very nice night club.” Then Rivera asked, “Do you know Lee Harvey Oswald?” Edisen replied, “No.” Rivera said that Oswald had lived in the Soviet Union, married a Soviet citizen, and had a child, and that they would soon be moving to New Orleans. Rivera suggested getting to know them, because they are a lovely couple. Then Rivera gave Edisen their upcoming telephone number, 899–4244. Upon returning to New Orleans, Edisen called the number given to her; she was told no one by the that name lived there. One week later she tried again. Oswald had just arrived. In finding out his address, Edisen remembered that it was a somewhat rundown neighborhood suggesting that Oswald was not a scientist who was of the same status as Edisen.

Rivera then asked, as they drove by the White House, “What will Jackie do when her husband dies?” Edisen exclaimed, “What?” Rivera then said, “I mean the baby. She might lose the baby.” He then told Edisen to write down the name, “Lee Harvey Oswald.” Then Rivera told Edisen to tell Oswald to “Kill the Chief. Were just playing a little joke on him. It will occur when the Shriner Convention comes to New Orleans. That’s in November. It will happen after the Shriners come to New Orleans” (Albarelli, 2013, pp. 137–138). The question that comes to mind is “How can a person know these details seven months before the incidents take place?”

Jean Pierre Lafitte. Jean Pierre Lafitte was a remarkable man. Here is a description of him given by George White (Albarelli, 2009, p. 429): “He was what you call a changeling. I don’t mean master of disguises. I mean an actual chameleon, a man that had the ability to transform himself right in front of you. He could go from good to bad, from rich to poor, from royalty to commoner, from intellectual to simpleton, from hoodlum to police officer. He would disappear for months or years at a time, and then show up at your door, like only a day or two had passed.”

White continued, “I liked him, but I never trusted him because he was always in the game. He only loved and cared about his wife and children; everyone else was fair game. He was the greatest imposter and confidence man that ever lived, not because he was a good actor, but because he was one hundred different people in one” (Albarelli, 2009, p. 429). It seems that Lafitte chose his own name. Most likely, he was born in New Orleans, perhaps

in 1902, 1907, or 1912. However, there are reports that he was born in Corsica. His mother was a madam. They moved to Marseille when Jean Lafitte was 7 years old. His mother apparently was murdered about a year later, though her body was never found. Relatives took him in, but he ran away and lived on the streets. As a practical solution to his situation, he worked in restaurant kitchens of restaurants, which provided him with food, and kept him dry and warm. He also acquired culinary skills that would serve him well. He claimed that he was descended from two pirate brothers, Jean and Pierre Lafitte, two well-known pirates from Corsica in the 1800s (Albarelli, 2009, p. 418).

Lafitte became an undercover contract agent for the CIA and the Narcotics Bureau, through George White. He was the person who convinced Joe Valachi to turn against the Mafia and testify against them.

Another strange situation occurred in 1953 but remained a mystery for more than 50 years. Dr. Frank Olson died in a bizarre way. Olson was a chemist for the military, but was “on loan” to the CIA. He had been involved in a couple of situations that caused him remorse, and apparently mentioned them to someone. He was deliberately given lysergic acid diethylamide (LSD) in a drink. Several other CIA co-workers also consumed LSD in drinks. Olson had a bad “trip”, and the plan was to take him by automobile to a CIA treatment facility in Maryland. This plan would have included George White and one accomplice, who would have been Jean Pierre Lafitte. However, White’s mother was quite ill in California and White went to see her; she passed away, and White remained there through her burial. Lafitte chose as his back-up, Francois Spirito, recently released from prison, but a long-time companion of Lafitte, from their days as youths in Marseille. In the hotel room in the Statler Hotel in New York on November 28, 1953, a struggle took place between Olson and the two men (Lafitte and Spirito) trying to remove Olson from the hotel room on the 13th floor (but numbered room 1018A). During the struggle, Olson was pitched headfirst through a closed window. He landed on his feet but was killed by the impact of the fall.

The Lafitte 1963 Notebook. As Albarelli was finishing his book, *A Terrible Mistake*, he became aware that Lafitte and his wife Rene were living in New England; as Albarelli was living in Vermont working on the book, he immediately got in contact with Rene, who was now Lafitte’s widow. In their conversations, she mentioned her husband had kept several datebooks. One that interested Albarelli was the one for 1963. Albarelli took a trip to her lawyer and several negotiations took place before an agreement could be made for her to release the notebooks. The agreement included areas that were not to be revealed. The notebook was in code. One example,

for September 22, 1963, is: *Oswald—Mex City Gaudet?* This is coded but more easily read than most entries. In terms of Oswald's actual activities, he had taken a trip to Mexico City earlier in late August when Gaudet was on the same bus traveling to Mexico City.

If that is what is referenced to, then this is a report of Oswald's activities, possibly only related to Lafitte at that time. While Albarelli concludes that Lafitte was the mastermind behind the assassination, the notebook was evidence that Lafitte was a silent scribe, reporting in code information perhaps intended for only Lafitte himself. Lafitte's wife Rene related that in more than 40 years, no one else had successfully sought the notebook. Additionally, she said his friend George White had introduced him to the CIA and the Federal Narcotics Bureau. We know that White did not trust Lafitte—why would the CIA trust him to be the mastermind behind the Kennedy assassination? Nevertheless, Albarelli concluded that Lafitte was the Project Manager.

Lafitte in New Orleans. Lafitte purchased a house in Gretna, Louisiana, a suburb of New Orleans, in late 1961 or early 1962. He was employed briefly as a maintenance worker at Reily Coffee for three months, before gaining work as a chef at one of New Orleans finest restaurants. Lafitte was given the job of keeping track of Lee Harvey Oswald on the day Oswald was hired at Reily Coffee. This job was assigned to Lafitte by Mr. T. (probably Tracy Barnes of the CIA; see Kent, 2021). Lafitte would remain as a special agent until 1978. In 1967, Lafitte became the manager and executive chef at the Plimsoll Club, located in the International Trade Mart, which formerly was under the direction of Clay Shaw.

OTHER PLAYERS

Financiers. Some of the financiers were persons being scammed by others involved in the assassination project. One such person was James Hoffa, President of the Teamsters Union. Using Teamsters' money as a loan (never to be repaid), Hoffa turned over 2.6 million dollars, and later, an additional 2 million dollars to Santo Trafficante, Jr., as payment for arranging the murder of President Kennedy; Hoffa believed Trafficante and Carlos Marcello were in charge of the assassination and did it on Hoffa's behalf (Ragano & Rabb, 1994). The financiers would include the Texas oil industry, the CIA, and organized crime. The latter two groups would also play other roles.

Planners and Decision-Makers. This would include persons who had the ability to give the go ahead for the plan to remove President Kennedy by way of assassination. Members of the inner circle would have included some of the long-time members from the CIA particularly persons

like James J. Angleton, though he may not have been a member of the inner circle. Members of the military might have been involved, but their involvement might have been on the periphery. One of these persons was General Le May, though his direct involvement could have been in the coverup only. In the actual decision making as to whether or not to proceed would likely have been as few as three persons. My assessment of Jean Pierre Lafitte is that he was kept in the loop, but as an advisor. Albarelli saw him as the actual main person in the coup, the Lancelot Project. We may yet come to know some of these persons and their roles in the Lancelot Project. Seemingly "up the food chain" from Lafitte was Otto Skorzeny who informed Lafitte on November 5, 1963, that the Lancelot Project was a go. Skorzeny's wife Ilse was an important person in this matrix of persons. While Otto was restricted to either his home in Ireland or Franco's Spain, Ilse was free to travel, and spent much of her time in the United States. Skorzeny had been important in World War II Nazi Germany and had been involved with commando training in Spain.

The Caretakers, or Handlers. Lafitte was a handler for Oswald from the day Oswald got the job at Reily for the time Oswald was in New Orleans. Along the way, Lee Harvey Oswald had several different handlers. Another handler likely was David Atlee Phillips. Earlier, George deMohrenschildt apparently also played this role for Oswald. Marina Oswald had handlers, including Ruth Paine, pre-assassination, and Isaac Don Levine post-assassination.

Jean Souetre. Jean Rene Marie Souetre was born October 15, 1930, in La Brede, France. In 1950, Souetre joined the French Air Force, rising to the rank of Captain. In 1959 he abandoned the French Air Force and joined the Organisation Armee Secrete-(OAS) with the intent of keeping Algeria under French control. In 1962, Souetre was involved in the attempted assassination of Charles deGaulle. Souetre was reportedly brought to Mexico along with other Corsicans to assassinate President Kennedy. Other Corsicans who might have been accompanying him were Michel Mertz, Michel Roux, and Lucian Sarti. Mertz and Roux were also pseudonyms used by Souetre. Whether there were three different people among Souetre, Mertz, and Roux is not clear. Reported by Benson (2002, p. 48), Sarti was the shooter behind the fence on the Grassy Knoll. According to Albarelli (2021), Souetre was either a shooter, or knew who they were.

DISCUSSION

The qualitative research summarized here disagrees with both the Warren Commission (1964) report and the 1977 Congressional Investigation of the JFK assassination. It also conflicts with John Armstrong's 'two Oswalds' hy-

pothesis. Firsthand information from several authors help in this effort. The Armstrong theory is decimated by Ernst Titovets, without Titovets ever hearing of Armstrong or his theory. Oswald freely speaking Russian in the Soviet Union accomplishes that. Judyth Baker's experience in being present when Oswald conversed with Jack Ruby or worked with David Ferrie renders the Warren Commission investigators' failure to learn this as remarkable. These experiences, together with Oswald's reasons to be in New Orleans (eventually, carrying the bioweapon to hand over to medical personnel to accomplish the demise of Fidel Castro), cast Oswald in a very different light from that portrayed by the Warren Commission. The change in the demeanor of Richard Case Nagell toward Oswald after their meeting in New Orleans is pivotal in Nagell's life. Oswald continued to advance prevention of the assassination of JFK in convincing an FBI agent to alert the Headquarters of the FBI of a possible assassination attempt in Dallas November 21–22, 1963.

It may be surprising that the coverup of the Kennedy assassination continues. Going back to 1965, a law was passed by Congress at the behest of Lyndon Johnson (89-318) that made all materials related to the assassination of President Kennedy the property of the U.S. government. While the appearance of the law was to keep safe such materials, its outcome was to keep such materials from the public. One such item was the pink outfit Jacqueline Kennedy was wearing. She turned it over to the government. It was put away for safekeeping and was to be left there until 2103. Even then, it was to have no public viewing. One sought-after item was JFK's Cartier wristwatch, given to him by Jacqueline Kennedy on their 3rd wedding anniversary in 1957. JFK did not like it and started wearing a new watch, an Omega. In 1960, Jackie put the Cartier watch with her other possessions.

On the morning of November 22, 1963, a Secret Service agent gathered all of President Kennedy's metallic items for radon detection, to be returned to JFK upon his return to Washington. Whatever protection that might have been afforded through these objects were stripped from him that morning. Jackie then retrieved the Cartier watch for President Kennedy to wear that day. Initially, the Secret Service was going to provide the Omega watch as the one he was wearing during the assassination. A nurse took the watch off President Kennedy's wrist at Parkland Hospital handing it to a Secret Service person, and the watch was to be returned to Jacqueline Kennedy. Evelyn Lincoln, President Kennedy's secretary, took possession of the Cartier watch. She left it in her will with several other JFK memorabilia to Robert White, a young man who wished to start a museum in honor of President Kennedy. Neither Lincoln

nor White knew anything about the 89-318 law regarding assassination materials. White sold the watch and some other materials to Christopher Fulton. What was important about the watch and Jackie Kennedy's dress? They both would have been spattered by material from JFK's brain, which would have contained not only blood, but also material from the bullet. Were the bullet to show signs of military-grade mercury, the cover-up would be jeopardized. Oswald would not have access to such bullets, and the military might be put in the position of having to explain the origin of the bullet. Fulton lived in Vancouver, British Columbia, and held citizenship in both the United States and Canada. In turn, he proceeded to sell the watch through Sotheby's to John F. Kennedy, Jr.

Fulton likely is the only person charged and convicted regarding the 1965 law on materials related to the JFK assassination. The prosecution sought a 25-year sentence for Fulton. Earlier a retired Secret Service agent named Robert Bouck handed Fulton a note inside a sealed envelope, which Fulton was to provide to the trial judge *before* the sentence was passed, which Fulton accomplished. Fulton was unaware of the contents of the note. Later, Fulton learned that the note said, "Working under executive order of the President of the United States, Ronald Reagan" (Fulton & Fulton, 2018, p. 287). After a two-hour recess, the judge returned and fixed the sentence to 8½ years with credit for time served. Fulton had 7½ years to go. During his incarceration, he learned of John F. Kennedy, Jr.'s death, the death of his grandparents, and that he would not be able to resume his life with his wife, without any explanation. Upon getting out of prison, he asked his father about his wife; he would like to see her if possible. His father took him to the cemetery to show him her grave. She was killed under suspicious circumstances in a car accident shortly after he was incarcerated (Fulton & Fulton, 2018).

IMPLICATIONS AND APPLICATIONS

The implications of the present research clearly point out that Oswald has wrongly been deemed the assassin of President Kennedy. However there appear to be no governmental efforts to reconsider this failure of removing the casting of Oswald as assassin. Perhaps it is because those who have benefitted from JFK's death wish to avoid the negative imputations and possible loss of wealth. Perhaps the current rancor in the political goings-on in the United States is enough reason for some to avoid yet another fire-brand issue. The hope is that addressing Oswald's miscasting as the assassin may someday be achieved in his native country.

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BRIEF REPORT

Study of Antibiotic Resistance in *E. coli* against Conventional Medicines as Compared to Natural Herbs

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HIGHLIGHTS

A new study found that tea tree oil was nearly as effective as prescription antibiotics in treating bacterial colonies, which showed low resistance to this natural substance.

ABSTRACT

The rising Incidence of antibiotic resistance has been increasing at an exponential rate in recent years, and since it is often caused by rampant misuse of drugs such as penicillin, many bacterial species such as *E. coli* have been able to mutate and gain multi-drug resistance and extended drug resistance (XDR) to form what is otherwise known as superbugs. The main purpose of our research was to investigate the efficacy of conventional medicines as compared to natural herbs in treating pathogenic bacterial colonies, so as to find an alternative to reduce antibiotic resistance. This study conducted an experiment and analysed the effectiveness of the conventional medicines and natural herbs, in treating an *E. coli* culture (K-12 strains). The experiment was carried out over a span of 14 days, with readings taken on every consecutive 2-day period. The efficacy was measured with respect to the zone of inhibition, and the results were compared for any form of resistance developed. The allopathic drug azithromycin, as hypothesized, was found to be the most effective in treating the *E. coli* culture, but a few resistant strains were observed. However, natural herbs like tea tree oil were not far behind, and only a few colonies of *E. coli* showed resistance against them. Erythromycin and garlic were not found to be as effective. This study answers questions on alternatives to conventional medicines and resistance to different substances. Further studies are however needed to establish the mechanism of resistance to these substances and to develop preventative measures.

KEYWORDS

Biology, antibiotic resistance, natural herbs, *E. coli*, conventional medicines

INTRODUCTION

The word antibiotic emerges from antibiosis, which means “against life” (Davies & Davies, 2010). From the onset of the first antibiotic, penicillin, developed by Alexander Fleming in 1928, antibiotics have occupied a central stage in today’s society (Davies & Davies, 2010). Antibiotics such as penicillin, erythromycin, neomycin, and others are known to treat countless bacterial as well as fungal infections (Martinez, 2014). However, recent studies show that these microbes are gaining resistance against certain

drugs, and this process is increasing at an exponential rate (Munita & Arias, 2016; Mwangi et al., 2019).

When the first antibiotic, penicillin, was developed, it was sold over the counter, and therefore everyone was able to procure it (Davies & Davies, 2010). However, rampant misuse of such drugs caused certain bacterial populations to undergo mutations and thereby gain resistance to this drug. Today the heavy use of antimicrobial drugs continues not only in human therapeutics but also in livestock production, leading to continuous contamination of our environment (CDC, 2021; Eliopoulos, 2003). Indiscriminate use



has led to the emergence and spread of antimicrobial drug resistance in microbes including dangerous pathogens leading to an imbalance in the micro-biota of our system and the environment (Benguigui & Salvatierra-González, 2000).

The World Health Organization defines antibiotic resistance as a form of drug resistance whereby some (or, less commonly, all) sub-populations of a microorganism, usually a bacterial species, are able to survive after exposure to one or more antibiotics; pathogens resistant to multiple antibiotics are considered multi-drug resistant (MDR) or, more colloquially, superbugs (Wiviott Tischler, 2013; Christaki et al., 2019). Antibiotics, once considered miracle drugs, have lost their extensive credibility. There are now hardly any antibiotics left to treat multi-drug-resistant (MDR), extended drug-resistant (XDR), and total drug resistant (TDR) pathogens. Even synthetic antibiotics, such as sulfa drugs, are not as effective with growing strains of sulphonamide-resistant *bacillus* (Egualé et al., 2015). In addition, there are no alternatives to antibiotics at hand or any insight at present. In spite of this, there are no policies to regulate antimicrobial drugs.

According to the CDC, "Each year in the U.S., at least 2.8 million people are infected with antibiotic-resistant bacteria or fungi, and more than 35,000 people die as a result" (CDC, 2013) In addition to this, certain sections of the population including those above the age of 60, children below the age of 18, and those with existing co-morbidities are likely to be at higher risk (Alós, 2015). Many medical advances are dependent on the ability to fight infections using antibiotics, including joint replacements, organ transplants, cancer therapy, and treatment of chronic diseases like diabetes, asthma, and rheumatoid arthritis (CDC, 2013), and therefore these might also be hampered, due to an increasing population of resistant pathogens (Gray & Wenzel, 2020).

In recent years of research on ways to minimize microbial resistance to antibiotics, many have sought to investigate natural sources as alternatives in treating resistant populations of different pathogens (Gray & Wenzel, 2020). There has also been a growing use of these alternatives and thus the United States Congress created the National Center for Complementary and Alternative Medicine (NCCAM) (Nahin & Straus, 2001).

Recent research has found that alternative medicines are usually used to treat the body and the mind wholly, as opposed to conventional medicines that are used to treat one specific medical condition (Onder & Liperoti, 2016). These alternative medicines are seen to be widely used for a variety of medical conditions, such as flu, diarrhoea, or pain. Without enough research in this field, these medicines are open to false speculations (Nahin & Straus, 2001). They

are rarely tested and often clear proof of benefits is lacking. However, there has been enormous research conducted on the conventional medicines and thus they are supported by scientific evidence. Although herbal or complementary medicines are safe, they can also cause negative effects on the body such as fatigue, nausea, vomiting, or seizures (Onder & Liperoti, 2016). There have also been reported cases of hepatotoxicity or liver damage, and life-threatening anaphylactic reactions to these alternatives. Often, these might also obstruct the conventional medicines from acting on the body, when most needed (Onder & Liperoti, 2016). However, as mentioned earlier, most conventional medicines are prone to resistance, and thus these alternatives must also be explored. Therefore, although herbal/complementary medicines might be promising, further research on them is still needed.

In our experiment, cultures of the K-12 strain of *E. coli* were used. *E. coli* is an important group of bacteria for study, since *E. coli* is known to develop resistance to certain beta lactam antibiotics such as erythromycin, and the protein biosynthetic pathway along with the nucleic acid structures are well-known. *E. coli* is commonly found around the gut area of humans and it is a pathogen known to be associated with diarrhoea, urinary tract infections, and meningitis. The particular strain was chosen because it is one of the most sensitive strains, and thereby we sought to determine if it can develop resistance to herbs and to conventional medicines. Since there are fewer previously known cases of resistance to this particular strain; it was best-suited for the purpose of this research.

In this study, we sought to ascertain if natural plant-based sources could provide any efficacy for the treatment of pathogens as compared to conventional medicines. Here, different cultures of *E. coli* were left exposed to different substances such as turmeric, tea tree oil, erythromycin, and azithromycin. One of the petri dishes containing the *E. coli* culture was left untreated to serve as a control. It was hypothesized that conventional medicines should have the capacity to annihilate the culture more rapidly than plant-based sources. We hope others will research this area to provide better treatment for curing microbial resistance and to prevent future pandemics.

MATERIALS AND METHODS

Preparation of the Culture Medium

All beakers and petri dishes were first cleansed and sterilized. The agar was melted using a microwave and then added onto 5 petri dishes, in equal proportion using 12.5 gm of Luria-Bertani broth in 500 ml of distilled water added to 7.5 gm of agar. The set so formed was allowed to

cool, and then the culture of *Escherichia coli* was transferred onto the petri dish. The *E. coli* colony was allowed to grow for 24 hours. In the preparation of the natural sources, which were assumed to act as antibiotics, tea tree oil was mixed and a separate solution of turmeric was prepared. The same was done for the medicinal drugs, azithromycin and erythromycin, which were dissolved in distilled water, separately (500 mg of each in 50 ml of distilled water).

After this, blank disks were soaked in each sample of the antibiotic prepared, and they were allowed to dry. Afterwards, an equal amount of disk was inoculated using sterile swabs of cotton, and then the disk was placed at near the center of the petri dish, with the help of tweezers. This was carried out in a laminar flow as shown in Figure 1. One of the petri dishes containing the bacterial culture was left untreated, and was considered as control. The lid was covered, and the prepared samples were labelled and placed in an incubator at about 37 degree Celsius.



Figure 1. Experimental setup, under the laminar flow, before the disks were inoculated with the *E. coli* strains.

Readings

The growth of the *E. coli* strains was checked after every two consecutive days. The growth was determined on the basis of the zone of inhibition diameter, which was calculated with the help of a vernier caliper. The zone of inhibition is the area around the antibiotic with no growth. It was also assumed that most of the calculated area is circular and this was calculated for 2 weeks. A bar graph was plotted based on the data obtained. All graphs were made with the help of Meta Charts.

RESULTS AND DISCUSSION

The petri dishes including the one used as a control were evaluated for bacterial growth at regular intervals. The consecutive diametric zone of inhibition was calculated,

and plotted on a table as well as on a bar graph (Figure 2, Table 1). The graphs represent the zone of inhibition of each sample, over consecutive days. These samples were analysed against the control medium, whose readings also were taken. The final graph (Figure 3) represents the final zone of inhibition of each sample, at the end of the second week.

After careful analysis of these data, it was observed that initially the area around the antibiotic discs, especially those exposed to the conventional medicines, were clear. The ones treated with the natural sources tea tree oil and turmeric also showed significant increase in zone of inhibition. In other areas which were not in direct contact with the antibiotic disc, the result was fewer colonies.

However, over time there was decreased efficacy of the samples treated against erythromycin and azithromycin, as the areas which were once devoid of growth during days 2 to 6 showed some growth in new colonies. These were the strains of the bacterial population that had gained resistance against the drug. Tea tree oil was the only natural source that was closest to erythromycin, and over the full course resistance against it was not developed. Diametric zones of inhibition were initially quite high for those treated with azithromycin and erythromycin but there were resistant strains as well. It was also found that erythromycin is comparatively weaker in treating *E. coli* than tea tree oil.

Discussion and Analysis

Resistance to drugs has been a major problem for health professionals and patients. Since the onset of the first antibiotic resistance to penicillin in the year 1947, the growth of superbugs has been rampant in the health sector. Millions of cases have been reported in recent years with regard to XDR, TDR, MDR, and other such strains. The CDC has also reported these cases on their scale of "urgent to watch" list, summarized in Table 2 (CDC, 2013).

Drug overuse is a deterrent to the efficacy of antibiotics. Resistance happens over time, when a particular bacterium incorporates mutations against a particular drug. This is usually associated with the plasmid DNA of the bacteria (Li et al., 2019) and is passed on to the other individuals in the colony. The plasmid DNA can be transferred between different bacteria, and therefore a bacterium can become resistant to multiple antibiotics at once by picking up a single plasmid. Genes that influence virulence are also found frequently on plasmids (ReAct, 2019). Genes which provide protection against antibiotics or metals are commonly found in the same plasmid, a phenomenon called co-selection (ReAct, 2019). This is also the reason why it is difficult to reverse resistance once it has been established in a bacterial colony. It would therefore not be enough to

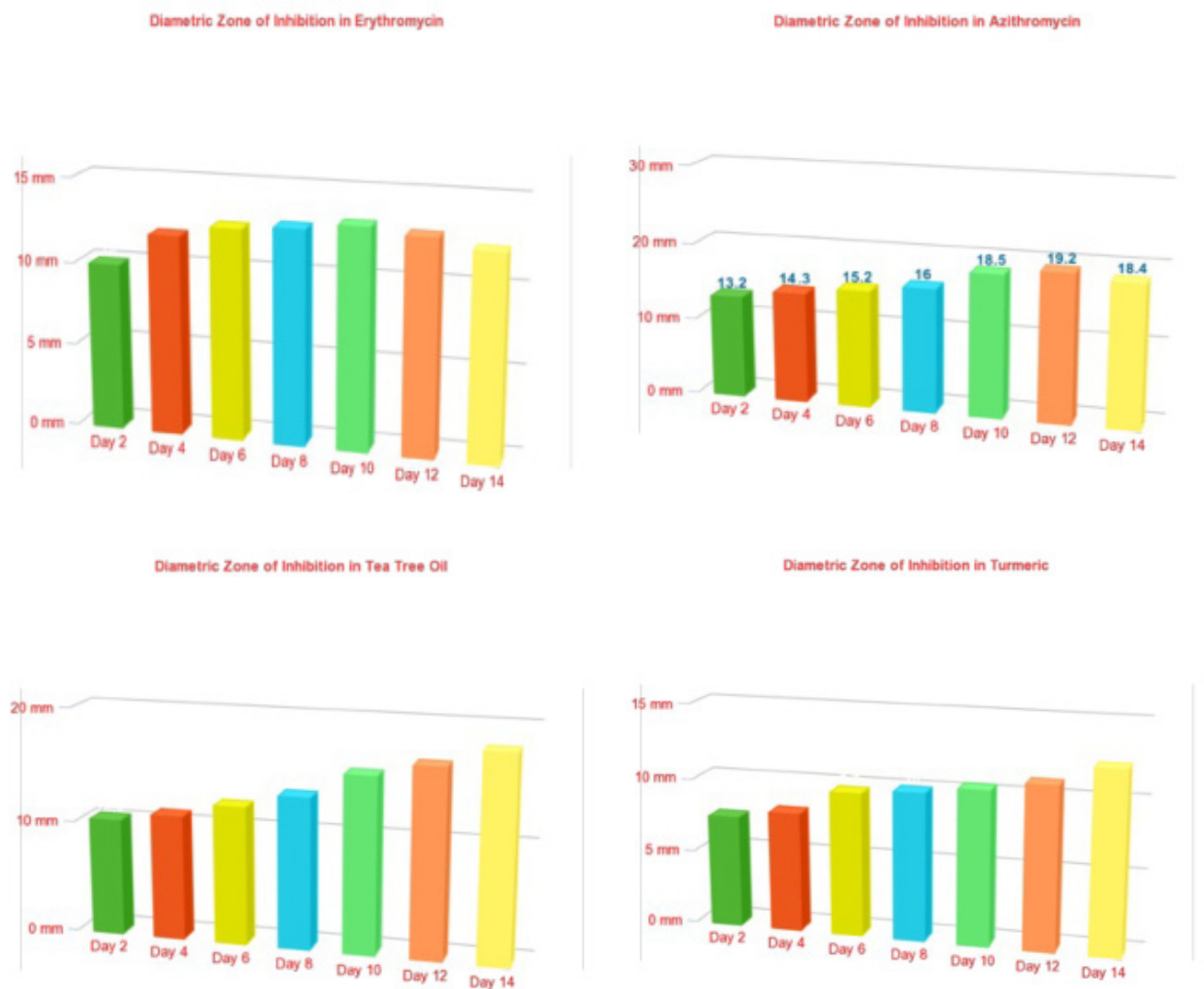


Figure 2. Diametric zone of inhibition in different culture media over a span of 14 days. Readings were taken after every 2 consecutive days.

TABLE 1. Diametric zone of Inhibition of *E. Coli* Colony over a period of 14 days.

The reading was taken on every consecutive day (after a skip of 1 day). There were significant differences between turmeric and erythromycin and tea tree oil and azithromycin, but this difference became minimal by day 14. Erythromycin and turmeric were not found to be very effective.

Type of Antibiotic	Day 2	Day 4	Day 6	Day 8	Day 10	Day 12	Day 14
Erythromycin	10 mm	11.9 mm	12.6 mm	12.8 mm	13.2 mm	12.8 mm	12.2 mm
Azithromycin	13.2 mm	14.3 mm	15.2 mm	16 mm	18.5 mm	19.2 mm	18.4 mm
Tea tree oil	10.3 mm	11 mm	12.2 mm	13.4mm	15.6 mm	16.7 mm	18.2 mm
Turmeric	7.5 mm	8 mm	9.7 mm	10 mm	10.4 mm	11 mm	12.3 mm
Control	0	0	0	0	0	0	0

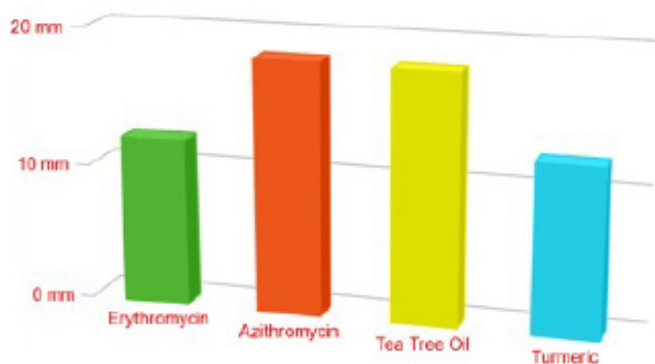


Figure 3. Final diametric zone of inhibition after a span of 14 days; the final zone of inhibition.

just stop the use of a particular antibiotic, as the resistance mechanism is linked to other antibiotics as well (Onder & Liperoti, 2016). This experiment has shown the very same phenomenon where the *E. Coli* strains had taken up resistance to a particular drug, and this resistance has been passed down to the rest of the colony as well, thereby showing considerable growth in the colonies of resistant strains.

Based on the results of this experiment, we can draw two conclusions. Antibiotic resistance happens over a period of time, and once shown in a bacterium is passed on to the rest of the colony. The next conclusion is that some natural herbs can act as an antibiotic. The results have shown that there is less resistance to natural herbs, and even though they take time to act, they might be a promising alternative to medicinal drugs.

These conclusions and data support the original hypothesis that drugs like erythromycin or azithromycin act at a faster rate than natural herbs, but there might be a significant increase in resistant strains when overused. This is so because these herbs are known to not only act on the bacterium but also help in enhancing the body’s immune system. Previous research studies have shown that polyphenols (a micronutrient) that we obtain from these herbs help in promoting the growth of the essential bacterial colony needed, at the expense of pathogens (Cardona et al., 2013).

The results indicated that patients should minimize the intake of antibiotics and take them only when prescribed by a medical professional. And a switch to natural herbs may provide significant protection, similar to medicinal drugs. As noted in this study, *E. Coli* doesn’t tend to show significant resistance to natural herbs despite prolonged exposure to the herbs. Some natural herbs (which are foods) can be considered as medicine themselves (Garcia et al., 2012).

The results of this research agree with past studies examining antibiotic resistance in different bacterial strains. These studies have shown that natural sources such as garlic and tea tree oil have a significant impact on enhancing the human immune response as well as serving as an antibiotic to certain strains of the bacterial population. However, further data are needed to establish how natural herbs are an effective measure against resistance.

Owing to constraints in resources, this experiment could not be repeated by us. As a result, the data, especially on bacterial growth, might be skewed. However, this study still indicates that natural herbs can act as a promising alternative to medicinal drugs (Garcia et al., 2012).

TABLE 2. Bacteria and Fungi Listed in the 2019 AR Report, CDC. This data was taken from the CDC report, wherein different resistant strains were weighted over a scale from Urgent to Watch (CDC, 2013).

Urgent	Serious	Concerning	Watch List
Carbapenum-resistant <i>Acinetobacter</i>	Drug-resistant <i>Campylobacter</i>	Erythromycin-resistant Group A <i>Streptococcus</i>	Azole-resistant <i>Aspergillus fumigatus</i>
<i>Candida auris</i>	Drug-Resistant <i>Candida</i>	Clindamycin-Resistant Group B <i>Streptococcus</i>	Drug-resistant <i>Mycoplasma Genitalium</i>
<i>Clostridioides difficile</i>	Vancomycin-resistant <i>Enterococci</i>		Drug-resistant <i>Bordetella pertussis</i>
Drug-resistant <i>Neisseria gonorrhoeae</i>	Drug-resistant Tuberculosis		

IMPLICATIONS AND APPLICATIONS

Antibiotic resistance mainly occurs due to overuse of drugs, and this can be minimized with the use of natural alternatives to medicinal drugs. Although in this experiment azithromycin was the most effective antibiotic, tea tree oil was not far behind. Some herbs may serve as promising antibiotics in the future. However, it is necessary that further research be carried out in this field to better explain the phenomenon and the molecular basis of resistance to both conventional medicines and natural herbs, alongside subsequent studies on other pathogens.

It is also of interest whether the current findings of this research can be generalized to other strains or bacterial populations, including the BM2195 *E. coli* strain, which is known for extensive antibiotic resistance due to its ability to inactivate many antibiotics. Also, tea tree oil cannot be taken orally and parenterally and is only given topically. Thus, this limits the clinical scope of the findings. However, the bactericidal components of tea tree oil could be harvested and incorporated into future drugs, which can be modified to be administered safely either orally or parenterally.

Research on other herbs that may show in-vitro effectiveness as tea tree oil might also be the next step. Future research on the comparative analysis of sulfa drugs against herbs such as tea tree oil is also the need of the hour.

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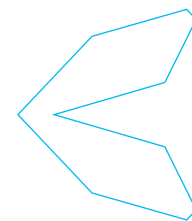
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BRIEF REPORT

Testing the Popular Belief That Men Have Commitment Issues

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HIGHLIGHTS

Big data affirms that ‘fear of commitment’ is generally higher in men than women, but younger and older groups of both men and women also show lower relationship readiness.

ABSTRACT

A sample of 36,592 online daters provided data on Commitment Readiness defined as “an individual’s desire and readiness to commit exclusively to one romantic partner” in relation to Age, Gender, and Parental Status (singles with and without children). Consistent with previous research, the women scored higher on Commitment Readiness than did the men. Furthermore, Age and Commitment Readiness showed a strong inverted U-shaped relation, with younger and older respondents scoring lower on Commitment Readiness as compared to individuals aged 31–60 years old. Interestingly, Commitment Readiness evidenced neither a significant effect of Parental Status nor an interaction of Gender by Parental Status. Besides the theoretical import of these results, our study illustrates the potential power of Internet research and provides a curious counterexample to criticisms of over-reliance on significance levels for correlational data.

KEYWORDS

Commitment readiness, gender differences, invented syndromes, pop psychology

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‘Fact,’ physically speaking, is the ultimate residue after human purposes, desires, emotions, and ideas and ideals have been systematically excluded. A social ‘fact,’ on the other hand, is a concretion in external form of precisely these human factors.

— John Dewey (1931/1985, p. 64)

Google the phrase ‘fear of commitment in men’ and more than 124 million entries emerge that frequently offer clinical tips and relationship advice on this topic, which clearly exists in popular (pop) culture as a ‘social fact.’ Of course, an important question for social scientists,

and the general public should be whether this popular belief has objective support or rather represents an invented syndrome (e.g., Lack & Rousseau, 2020) or a gender myth or stereotype (e.g., Slobodin & Davidovitch, 2019). Moreover, the plethora of online content about reputed commitment issues in men seems to underscore the trend for many people to use internet sources to self-diagnose or self-treat a variety of psychological or medical maladies (Alhusseini et al., 2020; Finney Rutten et al., 2019; Forkner-Dunn, 2003). We thus aimed to test this popular belief as part of our general research on the veracity of certain ‘pop psychology—medicine’ beliefs and concepts (see also Lange et al., 2022).



OPERATIONALIZING FEAR OF COMMITMENT

We define fear of commitment (FOC) as an ambivalence or lack of desire to commit exclusively to one romantic partner. While several factors are hypothesized to contribute to a willingness to commit, relatively few empirical studies have focused on romantic relationships. Our definition was inspired by the work of Arriaga and Agnew (2001), which tested Rusbult's notion that the commitment construct involves three factors: (a) long-term orientation, (b) intention to persist, and (c) psychological attachment (Rusbult & Buunk, 1993). They reported that with dating couples there is evidence of the predictive capabilities of all three factors in relation to level of couple functioning and eventual breakup status. Long-term orientation, in particular, appeared to figure heavily in the maintenance of relationships over time. We should note that this theoretical approach is likewise appropriate for the study of interpersonal domains (Tran et al., 2019). Moreover, the commitment construct plays a significant role in 'couple identity clarity' or the extent to which individuals in a romantic relationship believe they are a couple. Couple identity clarity is important because it influences partner perceptions of their affiliation and relationship persistence (Emery et al., 2021).

Adams and Jones (1997) sought to measure the relationship between three commitment constructs—i.e., commitment to spouse, commitment to marriage, and feelings of entrapment—and a variety of demographic characteristics such as educational level, income level, length of relationship, and number of children. They found the majority of demographic variables achieved significant correlation with commitment to marriage scores, and that education and income levels predicted scores on the feelings of entrapment measure. While length of relationship and number of children were unrelated to fear of entrapment scores, number of children was significantly and inversely related to commitment to spouse scores. Recent research suggests complex between factors such as these influence decisions to stay/leave relationships and can motivate individuals to remain in unrewarding relationships for the sake of their romantic partner (Joel et al., 2018).

In comparing male and female perceptions of romantic relationships, Sweet (1995) found that—contrary to previous research and theory on male experience—few men mentioned fear of intimacy or fear of being controlled. Moreover, about the same number of women reported these feelings as did the men in the study. However, significantly more men than women expressed fear of commitment ($p < .01$), among other factors. Sweet also analyzed the reasons

men gave for why they experience fear in relationships within the context of sex role expectations. Men expressed anxiety over their perceived need to be the dominant partner and to be in control of and responsible for making decisions in the relationship, according to social mores.

Similarly, Schmitt et al. (2003) studied the 'dismissing' form of adult romantic attachment orientation across 62 cultural regions. This refers to an avoidance of close personal relationships and the tendency to prevent romantic disappointment by maintaining a sense of relational independence and emotional distance (Bartholomew, 1990; Bartholomew & Horowitz, 1991). A major finding from this robust study was that "men are more dismissing than women in almost all cultures, but these differences are usually quite small in magnitude" (p. 322). Divergences like these between males and females are important in several ways. For example, men tend to regard their romantic partner as their principal source of social support. In contrast, women draw on a broader range of support mechanisms (Dykstra & Fokkema, 2007). Accordingly, romantic partnership is generally more beneficial to men's well-being than women's (Stronge et al., 2019; Taylor, 2011).

PRESENT STUDY AND METHOD

We aimed to replicate and extend the limited literature that suggests an increased propensity for men to report certain commitment issues (including FOC) compared to women. Jerabek, Jacobson, and Tidman constructed a 12-item, self-report 'Commitment Readiness Test' for use as an online psychological measure (2000, unpublished online psychological test, PsychTests.com, Canada). The test items used were selected to represent real-life, situational scenarios. For example, respondents are asked to imagine being in a particular situation and pick the answer that best matches their most probable behavior in such circumstances.

The item pool was created following an extensive analysis of available literature on the topic and with the intent to represent a cross-section of factors contributing to an individual's desire and readiness to commit exclusively to one romantic partner. Higher scores ostensibly represent an increased desire and readiness to commit, whereas lower scores are said to reflect an ambivalence or lack of desire to commit exclusively to one romantic partner, i.e., a greater FOC. The test was originally validated on an online sample of 29,679 respondents ($M_{\text{age}} = 22.6$ yrs, $SD = 7.7$). Jerabek et al. (2000, above) reported a Cronbach's alpha of 0.80 for the test.

A seven-item short form of this Commitment Readiness Test was later incorporated into a proprietary

romantic compatibility matching system (Lange et al., 2005–2006). Representative items from this shortened form include: “I’m comfortable with the idea of being with one person for the rest of my life (five-point Likert scale anchored by Strongly Agree and Strongly Disagree) and “I believe that a couple should spend X of their free time together” (six options anchored by 0–10% and 91–100%). Subsequently, we were given research access to data from a large sample of individuals ($n = 36,592$) who had used an online relationship-building service. This provided the opportunity to examine the FOC concept relative to Age ($M = 32$ yrs; $Median = 29.0$ yrs; $SD = 11.5$; range = 17–101 yrs), Gender (18,235 women; 18,357 men), and Parental Status (9,984 Singles with Children; 26,608 Singles Without Children). No other demographics were available for our sample.

RESULTS AND CONCLUSION

The Commitment Readiness variable ($M = 83.2$, $SD = 14.8$) as expressed on a normalized scale with scores ranging from 0 to 100 was subjected to a Gender x Parent (No vs. Yes) Analysis of Covariance (ANCOVA), using respondents’ age in years as a covariate. Acceptable model fit was obtained ($F_{22268,14319} = 0.88$) and statistically significant effects of age and gender were found.¹ In particular, Commitment Readiness tended to increase with age ($B = 0.35$, $SE_B = 0.007$, $t_{\infty} = 46.67$, $p < .001$, partial $\eta^2 = 0.056$)—i.e., with each year of age, respondents’ Commitment Readiness increased by about 0.35 scale units.

It is important to note that this finding does not hold for older respondents, i.e., those over 60 years of age. While there are relatively few such cases ($n = 611$, or 1.7%), the plot of the average Commitment Readiness by Age in Figure 1 shows a marked *decrease* in the older respondents’ scores on Commitment Readiness. That is, age and Commitment Readiness show an inverted U-shaped relation as witnessed by the finding of a powerful (negative) quadratic component ($t_{\infty} = -18.66$, $p < .001$). Since we are not aware of any previous studies that have reported such an effect, we would be interested in receiving any information that bears on this finding.

Consistent with previous studies (e.g., Schmitt et al., 2003; Sweet, 1995), the women generally expressed a greater Commitment Readiness than did the men ($M = 84.7$ vs. 81.9 , $F_{1,36587} = 278.10$, $MS_e = 200.04$, partial $\eta^2 = 0.008$).² Despite the large sample size, the ANCOVA showed neither a main effect for being a Parent ($F_{1,36587} = 2.11$, $p > 0.10$) nor a Gender x Parent interaction ($F_{1,36587} = 0.62$). This suggests, somewhat in contrast to the findings of Adams and Jones (1997),

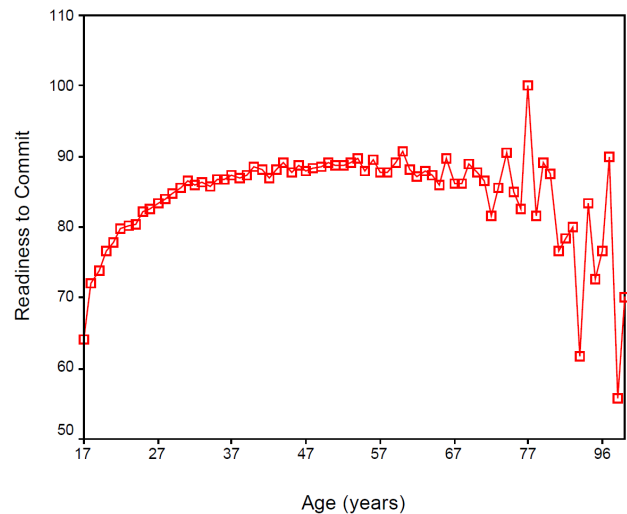


Figure 1. Average readiness to commit by age in years.

that the presence of children does *not* play a significant role in determining Commitment Readiness in a romantic relationship for either our male or female respondents.

DISCUSSION

Our results affirm that a lower Commitment Readiness (and an associated higher FOC) in men versus women is more than a social fact—this gender difference seems to be a legitimate effect. That said, large samples do not automatically overcome the problem of self-selection of participants. While this is a concern in any study, we have confidence in the present findings as they conceptually replicate prior gender differences in this domain (cf. Schmitt et al., 2003). However, our data also unexpectedly implicated respondent Age as a significant moderator of Commitment Readiness/FOC. This suggests that commitment issues focus on (a) men and (b) those over 60 years old (both men and women). However, additional research is needed to see if the patterns observed here pertain primarily to the attitudes of singles who use online dating or whether similar trends also extend to the general public and cross-cultural contexts.

Also needed are rigorous investigations of the extent to which similar-appearing concepts overlap with FOC, namely Fear of Intimacy, Fear of Entrapment, and Dismissing Attachment Orientations. In this context, studies should also examine the idea of Commitment Readiness or an individual’s degree of willingness to develop a close romantic relationship. Recent work has indeed demonstrated that commitment readiness in single (unpartnered) people influences their pursuit of

a relationship and the likelihood of future relationship initiation. The construct also likely interacts with anxieties about longer-term involvement, intimacy, entrapment, etc. (Hadden & Agnew, 2020; Hadden et al., 2018).

Finally, future research should explore the root causes of gender (and age) differences in FOC and related constructs. Evolutionary perspectives on courtship and rejection in humans offers a viable framework here. This view stresses the different resources that men and women traditionally contribute to producing offspring (Buss, 1988). As a result, FOC and commitment readiness might show differential patterns with perceptions of good health, youthfulness, and fertility in women versus physical dominance, ambition, and socioeconomic status in men (see, e.g., Whitty, 2004).

IMPLICATIONS AND APPLICATIONS

Putative evidence favoring assumptions and ideas that are engrained in cultural beliefs systems or endorsed by pop psychology does not correspondingly validate publicly available information or advice about those concepts. Thus, any proposed clinical counseling or other psychological guidance should also be carefully scrutinized by researchers to assess the accuracy of information and efficacy of treatment recommendations. This will become increasingly important as the public continues to turn to online sources of expert insights and diagnosis criteria to support their psychological and medical self-management.

On a more conceptual level, the large sample of respondents used here casts an interesting light on Meehl's (1990) contention that large databases always inflate small effects or artifacts to statistical significance (see also Standing et al., 1991). Specifically, our study provides an interesting counterexample to the argument against the process of null hypothesis testing. The enormous statistical power afforded by our substantial sample did not yield significant associations among all of the variables—a finding contrary to Meehl's assertion (1990) that “everything correlates to some extent with everything else” (p. 204). At the same time, the relatively small portions of the variance that are explained by age and gender support the notion that large samples may be needed to obtain replicable findings in social science research.

NOTES

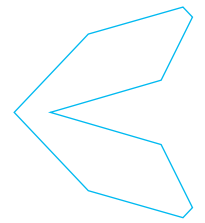
¹ Not surprising given the sample size, the observed power for $p < .05$ was essentially perfect (i.e., 1.00) for all effects, except for the Gender x Parent interaction (power = 0.16).

² Readiness to commit was evaluated at age 31.

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BRIEF REPORT

A Four-Element-Themed Self-Selecting Mobile Application for ESP Testing

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HIGHLIGHTS

A new computerized test for ‘extrasensory perception’ (ESP) is designed for use in everyday environments and draws on principles in occultism to promote better results.

ABSTRACT

A The current study engaged in a pilot data analysis for the purpose of examining a newly developed E (Element)-PSI application which was completed in varying real-life environments while reporting information about users’ location, mood, and focus on the ESP task. In addition, participants completed an ESP induction task, and trait measures of Transliminality, Paranormal Belief, and paranormal experience as measured by the Survey of Strange Events. A total of 44 participants from the United States completed the study as part of an initial registration process for an ongoing experiment. Results indicate small, but non-significant effects due to sample size in terms of the induction process and focus on the ESP task toward positive increases in ESP hit rates. Implications from these suggestive-only findings presented in terms of cultural, trait, and contextual variables contributing to ESP success rates are discussed in terms of using these findings toward formal large-sample replication.

KEYWORDS

ESP, psi, extrasensory perception, ESP testing, mobile application

INTRODUCTION

Studies on extrasensory perception (ESP)—or described more broadly as putative ‘psi’—have advanced and flourished since J. B. Rhine’s early experimental work (e.g., Bem, 2011; Rhine, 1950; Steinkamp et al., 1998; Tart et al., 1979). But this burgeoning literature also includes many debates about the meaning of the empirical findings (Bem & Honorton, 1994; Haraldsson & Houtkooper, 1995; Storm et al., 2012). For example, seasoned scientists in this domain are familiar with the critiques over mathematics (e.g., Rouder et al., 2013), procedural research design (e.g., Draconis, 1978), or in some cases seemingly external interference from so-called ‘Trickster’ effects (e.g., Kennedy, 2003). With respect to the above, we note that laboratory ESP studies do not consistently address or control for

environmental, trait, or contextual variables (with exceptions, e.g., Pérez-Navarro & Guerra, 2012; Tart et al., 1979). However, factors such as environment, traits, and context, under a trait model of ESP, could easily affect performance on ESP tasks.

The current research explores two empirical observations with psi research. *First*, laboratory studies occasionally seem to inhibit psi performance and, in many cases, even lack external validity (Mitchell, 2012; McDermott, 2011; Schram, 2005). *Second*, we do not ascribe to the idea that psi is a mechanistic process whereby participants perform like automatons. Rather, psi effects apparently involve mental processes and contextual cues that interact with general skills and traits within the participant population (Geukes et al. 2012; Yang et al. 2014). The former applies directly to ESP research findings in that decline

effects are likely in long-term repeated trials (Tart et al., 1979), whereas motivation, focus, and traits relate to success in any given task (Kennedy, 2003; Schmidt & Prein, 2019). Notably, varying environments, as well as feedback before or after ESP trials have been shown to facilitate or inhibit ESP performance (Haraldsson & Houtkooper, 1995; Schmidt & Prein, 2019; Tart et al., 1979).

We thus contend that proof- or process-oriented debates about ESP will only be resolved via a Hegelian interactionist model (e.g., Hegel, 1998) that considers the role of participants’ traits, beliefs, and environmental influences on ESP performance within ‘real world’ conditions. To this end, we report on a pilot study of our newly developed ESP testing application (or ‘app’) that can be conducted on any mobile device and notably in naturalistic settings, as well as being used on regular computers within laboratory settings. The app further gauges a research participant’s belief in their ability to correctly guess the ESP targets during the procedure, as well as their degree of focus on the ESP task. We also examine an induction technique based on the app’s use of the four traditional Western elemental symbols (i.e., earth, wind, fire, and water) to examine if visualization or mental imagery practice increases ESP hit rates in naturalistic environments.

METHODS

Participants

A total of 44 participants ($M_{age} = 44.67, SD = 14.09, range = 18-73$) from the United States completed the study as part of an initial registration process for an ongoing experiment. Participants comprised 14 males, 27 females, one transgender person, and one gender-fluid person. Most participants were Caucasian ($n = 42$), and two participants were of European and Cherokee ($n = 1$) and White and Asian ($n = 1$) descent. Table 1 gives the descriptive statistics for all the measures used here. Our participants comprised a targeted convenience sample of individuals who stated an interest in paranormal phenomena, and completed initial measures for a previous laboratory study. Our goal in repurposing these participants’ data is for the express purpose of a pilot study. As such, generalization of the findings to the population is clearly limited, but helpful in examining initial trends to guide future research.

Measures

E-PSI (Element-PSI) App. Designed specifically for this study by the first author in a Google Form format using natural randomization and blind-logic switch features, this app can be characterized as a double-randomized card draw from four possible choices. However, the current test

TABLE 1. Means, Standard Deviations and Range of Scores on Measures

Instrument	Mean (SD)	Minimum	Maximum
ESP Hit Rate (%)	21.59 (13.79)	0.00	60.00
NAP	26.56 (5.28)	17.12	44.12
TPB	26.44 (4.88)	11.16	39.23
TLIM	26.70 (5.22)	13.70	37.30
SSE	53.31 (11.96)	22.30	74.60
Confidence	10.61 (4.41)	5.00	23.00
Focus	10.86 (4.50)	5.00	21.00
Symbol Visualization	5.41 (1.67)	1.00	7.00
Image Association	4.74 (1.68)	1.00	7.00

N = 44. NAP = New Age Philosophy; TPB = Traditional Paranormal Beliefs; TLIM = Transliminality; SSE = Survey of Strange Experiences; Confidence = Confidence of ESP during trails; Focus = Focus during ESP trials; Symbol = Symbolic Visualization; Image = Image Association.

differs from the classic Zener card format in several ways. First, Zener symbols were eschewed in favor of the culturally and historically embedded symbols of the four elements. Thus, the participant is exposed to the four traditional elemental symbols of earth, air, fire, and water as possible choices. The rationale of using elemental symbols is clarified below in the description of the induction method.

Second, and unlike previous psi tests, the user selects their trial from a set of four trial options representing a series of four twelve-numbered series consisting of a combination of zeros and ones. With each trial case selection, the application randomizes the presentation order of these twelve number codes, preventing any ability of the user to memorize or notate specific trials should the E-PSI application be repeated. An example of trial selection is presented in Figure 1. Once a trial is selected, the participant engages in their ESP trial (see Figure 2) and is then instructed to select from a new series of four trials. Thus, the user under quasi-blind conditions selects one of four trials, each of which contains a different computer-selected target, negating either the need or debate over “purely



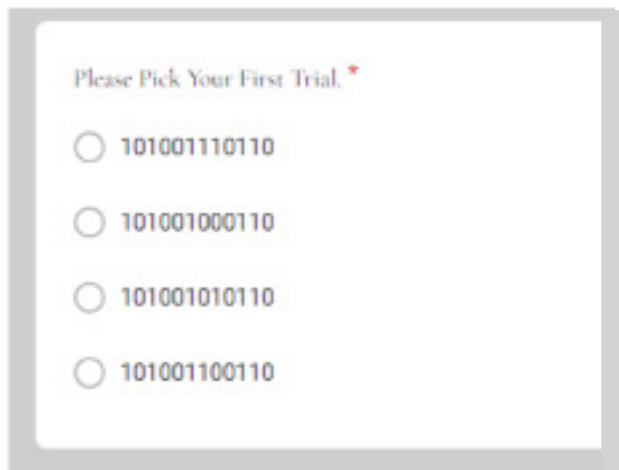


Figure 1. Example of ESP self-selection trial presentation. Note: Ordered presentation with each trial section is randomized, no number stays in the same position in subsequent trials or repeats of the test.



Figure 2. Individual ESP trial test example.

random number generators,” as the participant is entirely choosing their own six ESP trials from a possible 24 overall trials, with no cues or guidance as to what the target for any given trial will be. Particularly, for any given trial series, the participant will only interact with the random six trials they selected, and each of the 24 trials are presented and appear exactly the same, with the only difference being the target element in which a correct guess is deemed a ‘hit.’ We provide a visual summation of the selection process in Figure 3.

In full transparency, we should first note that the ESP application following some logic switching errors, allowed some participants to complete five trials, and others seven. Further, some participants completed multiple sets of ESP trials. In order to accommodate variance in the overall trials completed we created a standardized average hit rate based on total hits divided by total trials taken.

E-PSI (Element-PSI) App: Embedded Mood and Environment Measures. Embedded within the E-PSI app, and designed to both investigate and control for mood and environmental factors, are several initial questions posed before the ESP trials. These include the participant’s *specific location*, and four 4-point forced-choice Likert questions that assess *mood* (i.e., “I am feeling anxious or stressed” and “I am feeling happy”) and *environmental distraction* (i.e., “It is noisy or crowded where I am taking my test” and “I feel that I can concentrate”). Notably, Google Forms automatically timestamps survey entries, and with participant-provided location latency between tests and locations can automatically be coded. For the current study, the sample size was not sufficient to engage in tests with these embedded questions, which will be deferred for future studies with appropriately large sample sizes.

E-PSI (Element-PSI) App: Embedded Test Engagement and Expectancies. Also, within the app each individual ESP trial has two additional Likert questions to gauge engagement during each psi selection task. First, participants are asked “To what extent do you feel that your chosen answer is correct?” and to respond on a 4-point forced-choice Likert scale where 1 = *Not at all certain*, and 4 = *Very certain*. Second, participants are asked “How focused were you on selecting the correct element?” and to respond on a 7-point Likert scale ranging from 1 = *I had much difficulty focusing*, to 7 = *I was very focused*. The former question is designed to assess certainty in their psi/guessing response, while the latter question addresses general focus or involvement in the trial process.

E-PSI (Element-PSI) App: Induction Process. As part of the preparation for the study, participants were asked to complete a guided visualization exercise created as a Google form, in which the participant is guided through a brief breathing exercise, and then given specific instructions

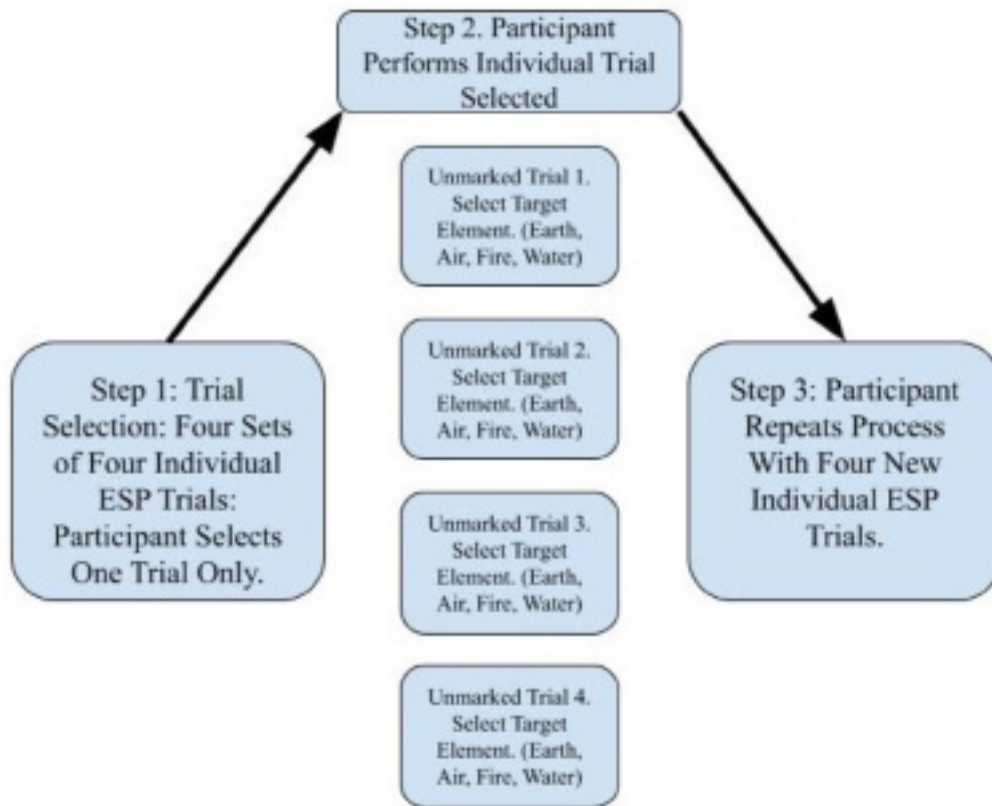


Figure 3. Flow diagram of trial selection and individual trial completion process.

on visualization for each of the four elements of earth, air, fire, and water, which are completed one element at a time. The content of this Induction Process represents an amalgam of pre-Victorian and post-Victorian magical associations used for occult ritual via western hermetic and occult practices (e.g., Gosden, 2020; Regardie et al., 1989). Visualization instructions contain two components: First, the induction form shows the symbol for a particular element, and next participants are told what descriptive traits are associated with the element (i.e., for earth, features of being solid, calm, material, practical, structured, and set). Subsequently, the participant is asked to see the symbol in their mind and then asked to associate this symbol in their mind with several sense modalities related to the element (i.e., for earth, standing barefoot on grass on top of a hill, while attempting to feel the grass under feet and smelling the earth below).

After each element, participants are asked to complete two Likert style questions both coded at 1 = *very difficult*, and 7 = *Very easy*. The first question asks, *To what extent could you see the "element symbol" in your mind?* ($n = 44$, $M = 5.41$, $SD = 1.67$), and the second question asks: *To what extent could you associate the additional images and feelings with this symbol?* ($n = 44$, $M = 4.74$, $SD = 1.68$). For the cur-

rent study, as it is a pilot, we averaged these visualization ratings across all four elements. However, we note for interested parties that both the induction method and ESP app are designed in such a way that future research can examine the relationship (if any) between the visualization of a particular element and whether the participant unconsciously picks trials from which a particular element is unknowingly selected as the target, allowing for an examination of unconscious psi in terms of which element target the participant selects based on their affinity in visualizing a particular element.

Standardized Scales

Revised Paranormal Belief Scale (RPBS: Lange et al., 2000a). The Rasch scaled RPBS comprises two, moderately correlated belief subscales that reflect "New Age Philosophy" (11 items, Rasch reliability = .90) and appears related to a greater sense of control over external events via belief in paranormality while "Traditional Paranormal Beliefs" (5 items, Rasch reliability = .74) represents more traditional cultural religious beliefs beneficial toward maintaining social control via determinism.

Revised Transliminality Scale (RTS: Lange et al., 2000b)

is a 17-item, T/F, Rasch-scaled measure of “hypersensitivity to psychological material originating in (a) the unconscious, and/or (b) the external environment” (Thalbourne & Maltby, 2008, p. 1618). The Rasch reliability is .82.

Survey of Strange Events (SSE: Houran et al., 2019). This is a 32-item, ‘true/false’ Rasch scaled measure of the overall perceptual intensity (or depth) of a ghostly account or narrative via a checklist of anomalous (subjective and objective) experiences inherent to these episodes. The Rasch reliability is .87, with higher scores representing a greater frequency and intensity of anomalous (‘ghostly’) experiences. Supporting the SSE’s construct and predictive validities, Houran et al. (2019) found that the phenomenology of ‘spontaneous’ accounts (i.e., ostensibly sincere and unprimed) obtained from survey respondents differed significantly from control narratives from other survey respondents who provided information while focused on ‘primed conditions, fantasy scenarios, or deliberate fabrication.’

RESULTS

Note that the purpose of pilot trials or studies is to test research protocols, data collection instruments, sample recruitment strategies, and other research techniques in preparation for a larger study (Kannan & Gowri, 2015; Kraemer et al., 2006; Leon et al., 2011). Thus, our preliminary data were not intended for hypothesis-testing strictly speaking, but rather to help establish the feasibility and usability of the newly developed psi-app. That said, analyses of the data did reveal some intriguing results that we discuss here in the hopes of motivating new research as part of a transparent model-building process. As such, the authors wish to clearly express the following findings as either suggestive or tentative pending future large-scale replication, as part of a transparent model-building process.

Demographic, Location, and Environmental Effects

Table 1 provides all the descriptive statistics, and we further found no compression, ceilings, or floors within the distribution of the variables. In terms of the location where participants completed their psi testing, the smaller sample size prohibits detailed analysis. However, a cursory inspection shows that participants used the psi-app at home ($n = 33$) or in a car ($n = 6$). However, a small number of participants did the testing at work ($n = 2$), at someone else’s home ($n = 2$), or in a hotel ($n = 1$). Participants were similarly asked about their environment and mood while taking the ESP test. Most participants disagreed (i.e., ‘not at all’ or ‘somewhat not’) that their environment was “crowded

or noisy” ($n = 37$ or 84.1%), and that they were not “feeling anxious or stressed” ($n = 35$ or 79.5%). Conversely, the majority of participants (i.e., ‘completely’ or ‘somewhat yes’) felt that they could “concentrate” ($n = 37$ or 84.1%), and that they felt “happy” ($n = 39$ or 88.6%).

In order to examine if participant age was related to the principal variables of the study, we computed standard Pearson r correlations with age as the dependent variable. Results indicate that age was significantly associated with NAP scores ($r = .401, p = .007$). However, we found no significant differences between age and ESP hit rates ($r = -.012, p = .94$) or scores on TPBs ($r = .278, p = .07$), TLIM ($r = .171, p = .27$), or the SSE ($r = .141, p = .36$). See Table 2 for Spearman ρ correlations of ESP hit rates with Induction scores and individual difference variables.

To explore for possible gender effects, we applied standard t -tests to gender and the variables of interest. No significant differences were found across gender for any measure: ESP Hit Rate ($t(42) = -.764, p = .45$); NAP ($t(39) = -.332, p = .74$); TPBs ($t(39) = -.846, p = .40$); TLIM ($t(39) = -.70, p = .49$); SSE ($t(39) = .865, p = .39$); Symbol Visualization ($t(39) = -1.08, p = .29$); Image Association ($t(39) = -1.97, p = .06$); Focus ($t(39) = .674, p = .51$); and Confidence ($t(39) = .71, p = .48$).

In terms of location and environment, we performed similar t -tests resulting in significant differences in ESP hit rates across location, where participants who took the test at home returned significantly fewer correct hits ($M = 19.17, SD = 13.25; t(42) = -2.087, p = .043$) than those who took the test elsewhere ($M = 28.82, SD = 13.40$). No significant differences in Symbol Visualization ($t(42) = -.764, p = .45$) or Image Association scores ($t(42) = -.334, p = .74$) were found across Location. Similarly, no significant differences in Noise ($t(42) = -1.50, p = .14$), Anxiety ($t(42) = 1.44, p = .16$), Concentration ($t(42) = .09, p = .93$), or Happiness ($t(42) = -.12, p = .91$) were found across the Locations.

Traits, Focus and Confidence, Induction, and ESP Hit Rates

The t -tests above indicated significant differences as a function of Location, but the Spearman ρ correlation matrix in Table 2 shows the ‘raw’ relationships between Paranormal Belief, Transliminality, and Paranormal Experience, as well as the participant’s Confidence and Focus during the ESP trials and any effect from the Induction Process. Overall, ESP hit rates were not significantly related to any of the variables in our small sample (ρ ’s $-.167$ to $.220$). However, the effect sizes in Table 2 would reach statistical significance if they replicated in larger samples (n ’s approximately 160 to 305). Notably, several patterns seem promising that are consistent with our emphasis on envi-

TABLE 2. Correlations Between ESP Hit Rates, Induction Scores, and Individual Differences

Scale	NAP	TPB	TLIM	SSE	Confidence	Focus	Symbol	Image
ESP Hit Rate	-.095	-.061	-.167	-.092	.104	.220	-.169	.148
NAP		.741**	.213	.189	-.226	-.296	.304*	.269
TPB			.233	.192	-.089	-.145	.208	.101
TLIM				.581**	-.263	-.311*	.409**	.433**
SSE					.029	-.023	.349*	.218
Confidence						.953**	-.249	-.227*
Focus							-.260	-.273
Symbol								.608**

N = 44. NAP = New Age Philosophy; TPB = Traditional Paranormal Beliefs; TLIM = Transliminality; SSE = Survey of Strange Experiences; Confidence = Confidence of ESP during trials; Focus = Focus during ESP trials; Symbol = Symbolic Visualization; Image = Image Association. * = $p < .05$; ** = $p < .01$.

ronmental and trait features associated with ESP hit rates.

Both Confidence in getting an ESP answer right and the participant’s Focus during the ESP task show correlations in a positive direction, but these variables are so highly correlated ($r = .95, p < .001$) as to be synonymous. Yet, Confidence in the ESP selection process is approximately related as half as strongly as Focus ($r = .104$ versus $.220, n.s.$) but representing together as much as a 5% variance shift in ESP hit rates. Further, the Induction Process provides mixed relationships to ESP hit rates, noting that visualizing the symbol is inversely related to ESP hit rates ($r = -.169, n.s.$), while visualizing a more complex tableau of modes of sensation associated with these elements is positively related ($r = .148, n.s.$) suggesting that more complex associations of sight, sound, and feeling with an element is better suited to affect ESP hit rates than simply familiarizing the participant with the symbol.

Finally, our measures of the broader level traits such as Transliminality, Paranormal Belief (i.e., New Age Philosophy vs Traditional Paranormal Beliefs), as well as Paranormal Experience are all small and negative predictors of ESP hit rates (r ’s $-.061$ to $-.167, n.s.$), which contrasts with previous findings (for reviews, see e.g., Thalbourne & Houran, 2003; Thalbourne & Storm, 2012; Ventola et al., 2019). However, given that we found statistically significant effects of Location, and findings from recent work show differential relationships between high and low levels of these variables, we strongly suspect there was variance suppression among these variables and ESP hit rates, due to the fact that median split high and low levels of Paranormal Belief and Transliminality are likely to have fundamentally different slopes of prediction. Thus, when not treated

separately, a classic slightly negative correlation appears due to the aggregation of two groups with different slopes of prediction.

DISCUSSION

At best, our findings are merely suggestive given that this was a pilot study using a smaller sample that mainly served to prove out a proof-of-concept of a new technological approach to psi research. To be clear, the point of our research was to show a transparent process for testing an interactionist model for psi-related phenomena in more natural settings. We thus contend that the methods and data reported here indeed make promising points that are ripe for replication and extension. For example, analysis showed significant differences in ESP hit rates even in our reduced sample. The findings further indicated significantly higher hit rates when participants took the psi-app test away from their homes, although hit rates did not significantly shift relative to participant Mood, Concentration, Noise, or Symbol Visualization. On the other hand, we did observe positive (but not non-significant) overall correlations with participant Confidence, Focus, and Image Visualizations. These patterns might imply that Focus, Confidence, and Concentration are primary success factors in ESP performance, with Mood and Environmental Variables as tertiary factors.

But there also were highly curious results that deserve further study. Particularly, the positive relationships between NAP, TPB, TLIM, and the SSE replicated previous studies (e.g., Laythe et al., 2018), but they all were inversely and only mildly associated with hit rates. That said, we



reiterate our strong suspicion that there could be differential slopes on ESP performance between participants with high levels and low levels of these same traits. We are unable to tease out these effects here, so future research should examine these unexpected patterns in hit rates with larger samples that provide ample power to test for differences between low-scoring vs high-scoring groups across the personal characteristics above.

However, our data do make a broader point if we remember that significant ESP hit rates are typically small. For instance, Bem's (2011) famous pre-sentiment studies show an aggregate .012 variance effect size. Similar small effects are found in meta analysis (e.g., Sherwood & Roe, 2003; Tressoldi et al., 2010). Given these small but significant effects, we opine that researchers in ESP should be actively concerned about variables like the ones we study here, noting that while the effects are small, they are surely sufficient to make the difference in a significant or non-significant ESP effect.

Namely, this study ostensibly affirms that variance in ESP hit rates is related to participants' Traits, Focus, Concentration, and sensory association with the Target Symbols used in the task. Recall that Confidence and Focus were measuring basically identical concepts for the current participants ($r > .95$), but the combined variance of these two variables shifted ESP rates upwards of five percent, with Image Association adding another 2%. In aggregate, and with larger samples typically seen in ESP tests, seven percent above chance performance is certainly sufficient to contribute to a significant effect.

Taken altogether, our pilot data support an interactionist model for psi effects in that contextual traits and environments ostensibly affected ESP scores, albeit not powerfully so. This means that both laboratory and field studies of psi phenomena should account or control for these variables. Perhaps most importantly, our approach also demonstrates the importance of testing methods that can be used across disparate settings and thus have value for modeling how ESP appears to work 'in the real world.' Both issues are conspicuously absent from the literature except for broad-based large-sample studies (e.g., Milton & Wiseman, 1999; Wiseman & Greening, 2002), which do not account for traits, culture, or beliefs that inhibit or increase the performance of ESP tasks.

From our own work (Laythe et al., 2022)—and beyond the variables measured here—we think it is likely that ESP performance is also influenced by ideological or cultural structures (Drinkwater et al., 2019; Hill et al., 2019; Laythe et al., 2022). To be sure, Paranormal Belief itself represents a higher-level structure of belief compared to the typically ongoing developmental influences from childhood, such as attachment, which foster differing beliefs in religious ide-

ology, and subsequently paranormal experience (e.g., Kirkpatrick, 1998; Rowatt & Kirkpatrick, 2002).

As such, studies of ESP must examine not only core predictive traits such as Transliminality and Paranormal Belief (Houran et al., 2022), but also participants' broader Religio-Cultural Beliefs in order to better understand the 'tree' of ESP in context of 'the forest' in which it is situated. Notably, previous research clearly shows a cultural relationship to primary variables associated with paranormal experience (including ESP) and religious beliefs and experience (i.e., McClenon, 2012; Maltby & Day, 2002; Demmrich et al., 2013).

Finally, as a pilot test we note that our E-PSI app was arguably successful in terms of (a) demonstrating variability in participant's ESP guessing (0–60%), (b) its capability to assess contextual, focus, and trait variables in real-world environments that coincide with ESP outcomes, and (c) a small non-significant contribution to ESP scoring as a function of an induction process which facilitates visualization of the target ESP symbols.

To the latter, whereas the current pilot data shows a positive relationship with ESP scoring, we wish to be clear that without comparison use of an induction method with non-esoteric symbology (i.e., Zener symbols), it is unclear if this small effect is due to the induction, the use of historically embedded religio-cultural symbols (i.e., the four elements), or a combination of the two. They are inherently confounded. As such, future research will need to further examine induction techniques in contrast with different sets of symbols, noting the likely possibility that a cultural or historical connection with symbols may be the underlying variable which fuels a useful symbol induction process.

As the E-PSI app is, in essence, a forced set of both participant selected trial selection, and ESP target selection, it essentially dodges the issue with computerized "true randomization" (e.g., Rouder et al., 2013). As each self-selected trial set (of four possible trials) looks identical, and each trial itself is presented identically, we end up with participants quasi-randomly choosing their own "path" through the ESP application without any notable cues. From our perspective, this is a benefit, as the only response bias attributable to the E-PSI application would represent a failure in the logic switches to send participants to a particular trial set. Again, as all trial sets and individual trials are identical (except for the selected ESP target), we do not deem computer or coding error to have any particular effect on scoring. Rather in this case, bias toward a particular response set falls securely on the participant, with no evident cues to purposely guide them to favor a particular trial set choice.

We hope that our pilot work inspires the use of our E-PSI app within 'citizen science' frameworks (Ceccaroni

& Piera, 2017). The growing popularity of this approach in mainstream academia (e.g., Skarlatidou et al., 2019; Trojan et al., 2019) underscores its promise to expand or bolster research designs across frontier science. Indeed, the literature over the last decade alone provides ample case studies on managing and evaluating citizen science projects (Jordan et al., 2012), as well as the diversity of participants (Pandya, 2012) and volunteer outcomes (Skarlatidou et al., 2019).

However, parapsychologists have not effectively leveraged citizen scientists despite important advancements in both lay-friendly questionnaires and instrumentation (for an overview, see Laythe et al., 2022). It is therefore our hope—as we plan formal replications of the study above—to invite fellow parapsychologists and citizen scientists to use this application, freely available at request to the first author, to collect large, multi-cultural samples in order to determine the extent to which environmental, trait, and cultural variables positively or negatively affect ESP performance.

In closing, we openly offer the E-PSI application to any qualified researchers who have a Google email account and a willingness to use either the E-PSI app or the induction method described here. Indeed, we will heartily cooperate with any interested researchers who wish to expand, replicate, or contravene the data presented here.

IMPLICATIONS AND APPLICATIONS

Our study demonstrated the feasibility and usability of using a mobile application for ESP testing that also can address contextual, cultural, and environmental variables which may contribute to successful outcomes. Further, our pilot data serve to make the research building process with larger samples more transparent. Indeed, we hope that user-friendly technologies and methodologies as described here will motivate more strict replications via the participation of citizen scientists in parapsychology who can help to build cumulative databases (cf. Laythe et al., 2021). Progress on this latter goal could minimize the need for preregistering research designs, which can be a tedious and time-consuming exercise. Preregistration is said to improve the interpretability and credibility of findings (Nosek et al., 2018), but we tend to agree with those scientists who have questioned the underlying reasons that are cited for this widely adopted conclusion (e.g., Pham & Oh, 2020; Rubin, 2020).

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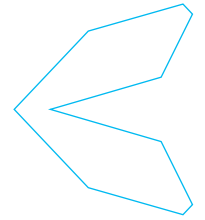
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ESSAY

Editor's Preface to Essay Section

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The following content constitutes an informal but fortuitous collection that speaks to methods and analysis in frontier science. Articles about model-building or theory formation on anomalous phenomena often garner the strongest interest for understandable reasons, but the underlying approaches and techniques that drive charge- or challenge-type discoveries arguably represent some of most fascinating and important information. To be sure, descriptions of flexible or innovative methods can inspire and support work across many different academic disciplines. Thus, the *JSE* welcomes submissions that present newly developed (or specifically tailored) methods and instrumentation for studies in anomalistics. We further encourage readers to explore the many peer-reviewed journals devoted to analytics, instrumentation, and research design. Interested readers can search and learn about such journals at aggregator sites like Publons.com or Resurichify.com, but Table 1 below presents a convenient selection of 25 examples that arguably are worthy of attention, with good-to-high impact factors.

Note that “Impact factor” is currently the leading metric of a journal’s status and influence, but that its limitations [e.g., Antonoyiannakis, M. (2020), Impact factor volatility due to a single paper: A comprehensive analysis. *Quantitative Science Studies*, 1, 639–663. https://doi.org/10.1162/qss_a_00037] have motivated many authorities to argue for alternative, supplementary, or new metrics [e.g., Wouters, P. et al. (2019). Re-thinking impact factors: Better ways to judge a journal, *Nature*, 569, 621–623. <https://doi.org/10.1038/d41586-019-01643-3>].



TABLE 1. Popular Journals on Scientific Methods and Analysis

Name	Description [†]	Impact Factor	URL
Nature Electronics	Publishes both fundamental and applied research across all areas of electronics, from the study of novel phenomena and devices to the design, construction and wider application of electronic circuits. It incorporates the research of scientists, engineers and industry, and provides comment, review and analysis of the key issues shaping the field and the key technologies reshaping society.	13.56	https://www.nature.com/natelectron/
ISPRS Journal of Photogrammetry and Remote Sensing	Provides a channel of communication for scientists and professionals in all countries working in the many disciplines that employ photogrammetry, remote sensing, spatial information systems, computer vision, and related fields.	11.91	https://www.journals.elsevier.com/isprs-journal-of-photogrammetry-and-remote-sensing
IEEE Geoscience and Remote Sensing Magazine	Provides information on international remote sensing activities and new satellite missions, publishes contributions on education activities, industrial and university profiles, conference news, book reviews, and a calendar of important events.	8.63	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=6245518
ACS Sensors	Disseminates new and original knowledge on all aspects of sensor science that selectively sense chemical or biological species or processes. Articles may address conceptual advances in sensing that are applicable to many types of analytes or application papers which report on the use of an existing sensing concept in a new way or for a new analyte.	8.57	https://pubs.acs.org/journal/ascefcj
ISA Transactions, Sensors and Actuators B: Chemical	Publishes research and development in the field of chemical sensors and biosensors, chemical actuators and analytical microsystems that progress beyond the current state of the art in these fields along with applicability to solve meaningful analytical problems.	8.42	https://www.elsevier.com/journals/sensors-and-actuators-b-chemical/0925-4005/subscribe
Journal of Statistical Software	Publishes articles on statistical software along with the source code of the software itself and replication code for all empirical results. Furthermore, shorter code snippets are published as well as book reviews and software reviews.	6.274	https://www.jstatsoft.org/index
Sensors and Actuators Reports	Publishes new and original works in the field of all type of sensors and actuators, including bio,, chemical, physical, and nano sensors and actuators, which demonstrates significant progress beyond the current state of the art. The journal regularly publishes original research papers, reviews, and short communications.	6.22	https://www.sciencedirect.com/journal/sensors-and-actuators-reports
IEEE/ACM Transactions on Audio Speech and Language Processing	Dedicated to innovative theory and methods for processing signals representing audio, speech and language, and their applications. This includes analysis, synthesis, enhancement, transformation, classification and interpretation of such signals as well as the design, development, and evaluation of associated signal processing systems.	6.02	https://signalprocessingociety.org/publications-resources/ieeacm-transactions-audio-speech-and-language-processing
Behavior Research Methods	Covers methods, techniques, and instrumentation of research in experimental psychology, with particular focus on the use of computer technology in psychological research.	5.953	https://www.springer.com/journal/13428
IEEE Transactions on Instrumentation and Measurement	Publishes innovative solutions to the development and use of electrical and electronic instruments and equipment to measure, monitor and/or record physical phenomena for the purpose of advancing measurement science, methods, functionality and applications.	5.59	https://ieeexplore.ieee.org/xpl/aboutJournal.jsp?punumber=19

Measurement: Journal of the International Measurement Confederation	Covers novel achievements in all fields of measurement and instrumentation and includes subjects such as: measurement and metrology fundamentals, measurement science, sensors, measurement instruments, measurement and estimation techniques, measurement data processing and fusion algorithms, evaluation procedures for performance analysis of measurement systems, processes and algorithms, mathematical models for measurement-oriented purposes, and distributed measurement systems in a connected world.	5.5	https://www.journals.elsevier.com/measurement
IEEE Transactions on Radiation and Plasma Medical Sciences	Addresses technology and application areas related to radiation and plasma-based medical sciences. These areas include radiation detectors for medical and biological applications; imaging system design, optimization, and performance; therapy-related system design, optimization and performance; radiation-application-based image reconstruction, data analysis and image processing; medical radiation therapy applications; clinical/preclinical evaluation of imaging and therapy systems, plasma applications in medicine and biology; and simulations for imaging and therapy applications.	4.95	https://ieeetrpms.org/about-this-journal/
International Journal of Qualitative Methods	An eclectic international forum for insights, innovations and advances in methods and study designs using qualitative or mixed methods research. The journal publishes methods papers, and study protocols.	4.828	https://journals.sagepub.com/home/ijq
EJNMMI Physics	A multi-disciplinary forum that welcomes original materials and studies with a focus on applied physics and mathematics as well as imaging systems engineering and prototyping in nuclear medicine.	4.20	https://ejnmphys.springeropen.com/
PFG Remote Sensing and Geoinformation Science	Covers the progress and application of photogrammetric methods, remote sensing technology and the interconnected field of geoinformation science. It emphasizes new methodologies in data acquisition and new approaches to optimized processing and interpretation of all types of data acquired by photogrammetric methods, remote sensing, image processing and the computer-aided interpretation of such data in general.	4.09	https://www.springer.com/journal/41064
International Journal of Social Research Methodology	Addresses on-going and emerging methodological debates across a range of approaches, both qualitative and quantitative, and including mixed, comparative and simulation methods, as these relate to philosophical, theoretical, ethical, political and practical issues.	3.468	https://www.tandfonline.com/toc/tsrm20/current
Structural Dynamics	Covers the technologies, fields, and categories related to condensed matter physics, instrumentation, radiation, and spectroscopy.	3.07	https://www.aapm.org/
Ultramicroscopy	Provides original research papers, invited reviews and rapid communications on the advancement of new methods, tools and theories in microscopy.	2.91	https://www.sciencedirect.com/journal/ultramicroscopy
Physics in Medicine	Covers the application of theoretical and practical physics to medicine, physiology and biology.	2.71	https://www.sciencedirect.com/journal/physics-in-medicine
Journal of Synchrotron Radiation	Provides comprehensive coverage of the entire field of synchrotron radiation and free-electron laser research including instrumentation, theory, computing and scientific applications in areas such as biology, nanoscience and materials science.	2.52	https://journals.iucr.org/s/
Field Methods	Addresses the various methods used by field investigators from the social and behavioral sciences in the collection, management, analysis and presentation of data about human thought and/or human behavior in the natural world. The data can be qualitative or quantitative, as can the methods for analysis and presentation.	1.782	https://journals.sagepub.com/home/fmx
Journal of Analytical Sciences, Methods and Instrumentation	Concerns all aspects of theory and practice of analytical sciences, measurement science, analytical methodology, experimental methods, experimental protocols, technical characterizations and instrumentation (sampling, analysis, electrochemistry, microscopy, spectroscopy, mechanical analysis, thermal analysis, separations, spectroscopy, chemical reactions and selectivity, imaging, surface analysis, and data processing among others).	1.14	https://www.scirp.org/journal/journalarticles.aspx?journalid=525
Journal of Instrumentation	Covers major areas related to concepts and instrumentation in detector physics, accelerator science and associated experimental methods and techniques, theory, modelling and simulations. It also covers methods and apparatus for astronomy and astrophysics.	1.07	https://iopscience.iop.org/journal/1748-0221

† Adapted from descriptions on the respective journals' websites.





ESSAY

Experimental Design to Assess the Existence of Chakras

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HIGHLIGHTS

A new research design aims to overcome the limitations of past studies on 'chakra energy fields' in order to advance scientific knowledge of this understudied topic.

ABSTRACT

The existence of the chakras and their associated energy fields is admitted by oriental tradition but has never been scientifically and convincingly demonstrated. After showing the weaknesses of past attempts toward this goal, the author describes preliminary experiments which enable to better specify behavior of the chakra energy field. From these empirical results, a new experimental protocol is carefully designed and proposed, along with the relevant statistical analysis. The main experiment detailed here relies on randomly generated trials monitored by a computer to ensure that the double-blind criterion is met.

KEYWORDS

Chakra, chi, prana, biofield, bioenergy field, subtle energy, body's energy

The chakra concept forms part of yoga philosophy and practice. As is known from historical data, yoga and chakras were mentioned across different yet contemporaneous philosophical and religious systems in South Asia. However, from one belief system to another, yoga and chakra descriptions remain surprisingly close: "Although traditional yoga rarely, if ever, occurs outside of particular religious and doctrinal contexts, these contexts vary considerably, while yoga itself retains essential theoretical and practical commonalities" (Mallinson & Singleton, 2017, p. x).

Among the Muktika canon comprising 108 Upanishads sacred texts, there are twenty chapters concerning yoga and chakras, the Yoga-Upanishads. Yoga practice is notably described in the Maitrayaniya (1st millennium BCE), the Shvetashvatara (5th century BCE), and the Kundalini Yoga Upanishads. Although the Kundalini concept is mentioned as early as the 8th century CE, in the Netra-Tantra, it is thought that the Kundalini Yoga Upanishad is one of the later groups to have been added to the Upanishads, around the 16th century CE (Mallinson & Singleton,

2017). Other sources for yoga practice and philosophy are the *Bhagavadgita*, from the 3rd century CE (Mallinson & Singleton, 2017), which occupies chapters 23 to 40 of Book VI of the *Mahabharata* (Doniger, 2021), and Patanjali's *Yogasutras* thought to be written between the 2nd century BCE and 425 CE (Flood, 1996; Maas et al., 2018). Chakras were first described as wheels related to Brahman in the oldest scriptures. Later, they were mentioned in connection with a yoga practice first in the *Netra-Tantra* (chapter 7) dated to the late 8th century CE (Flood, 1996).

The current representation of the chakras dates back to 1577, when they were first described by Purananda in his *Shat-Chakra-Nirupana*, in relation to the energy flow along the nadis close to the spinal cord (Motoyama, 1981). Purananda describes the Kundalini awakening as this flow of subtle energy along the spine which provides energy to all the chakras on its path. It may be surprising that even if the chakras have been known about for such a long time, "there is no explanation of how non-physical chakras influence physiological function. Even more there is no valid scientific study that proves that the chakras,



or anything like that, really exist" (Ristovski & Davidovic-Ristovski, 2011). This is confirmed by Chinese scholars, e.g., "the existence of an energy system has not yet been scientifically demonstrated" (Liu, 2018). In the West, some authors have associated chakras with endocrine glands (Brennan, 1988) or with the nerve plexuses (Leadbeater, 1927). However, chakras are traditionally related to an energy field called chi in China or prana in India, essentially referring to the same concept. In the West, prana has also been called the "biological field," "bioenergy field," or "vital fluid." It should be noted that the chakra concept is not limited to Asia, but is known under different names and among various cultures elsewhere in the world.

According to tradition, the chakras are located partly inside and partly outside the body, emanating from it at specific locations, for example along the spinal cord or some meridians. As stated above, it is yet unclear whether the chakra energy interacts with our body and how. Many questions arise when considering the possibility of chakra existence: Is chakra energy supporting our body, or is it originating from our body, or is it a separate entity from our body? Is the chakra portion residing outside the body merely subjective or could it be demonstrated to be real? Are chakras purely symbolic or do they represent real entities, although non-physical ones?

The admitted non-physical, unknown, nature of the chakras raises the difficulty of interacting with them through any device to prove their existence (Maxwell, 2009): "The challenge for anyone interested in explaining chakras is to be able to demonstrate how something nonphysical could interact with the physical."

However, demonstrating the reality of the chakras may bring great advances in different fields, not only to yoga studies. A fairly exhaustive list of implications that would arise from validating the existence of the chakra energy field has already been given (Tiller, 1993). I will highlight a few items here.

Scientifically confirming the chakra's existence will change the way traditional Chinese and Indian medicine and practices are perceived in the West. It would indeed be a first step toward acknowledging the traditional claims around meridians and chakras.

From a spiritual point of view, the existence of chakras would fuel our questioning around the possibility of a conscious entity separated from the body. This would then lead us to the question of the survival of this energy field after death, i.e., of the immortality of the soul.

We can also imagine that the chakra radiating field could be a medium able to convey biological information. This could shed a light on memory of water and homeopathy issues. From a physics perspective, validating the existence of a new field such as the chakra field could have important

implications, at a time when the unification of quantum mechanics and general relativity has not yet been achieved.

METHODOLOGICAL WEAKNESSES OF PAST APPROACHES

Many ways of assessing the chakra energy field have been used in the past. These fall into three main categories:

- direct or indirect measurements or observations attributed to chakras;
- theory-building that would account for observed facts or share similarities with these facts;
- testimonials collection.

The methods in the first category were explored by Motoyama (1981), Hunt (1996), and others (Curtis et al, 2004; Korotkov et al., 2009).

Motoyama built a recording booth electrically shielded from outside electromagnetic disturbances. He measured the body's electromagnetic field by placing a round electrode at a distance from the skin surface of the subject. He said that these measurements accounted for the chakra energy field and measured people claiming to be skilled at using and projecting chakra energy. But these experiments were based on the hypothesis that the measured electric field could be somewhat related to the chakras through the nervous systems of the subjects. However, no explanation was given as to why the sensor measurements could be related to chakra behavior. Moreover, no justification was provided as to why this specific measuring device would be more relevant than any other to record chakra data.

Hunt found that electrical activity changed at the locations of the chakras in synchronization with biofield energy progression through the body. She measured electrical activity with electromyography bipolar sensor electrodes attached to the skin at body points corresponding to chakra locations. During the experiment, an aura reader would describe the path followed by the biofield energy and its behavior. The reader described, e.g., which body zone was being entered and where the energy would stay longer. Both the reader descriptions and the electrical activity were recorded simultaneously. After the experiment, it became obvious to Hunt that electrical signals changes seen on the printer were time-correlated to the spaces crossed by the energy as recorded on tape and described by the aura reader.

Again, in this experiment no clear rationale is given to explain how the measured electrical activity could be related to chakra activity. We could imagine that what was being measured and seen by the aura reader could just be electrical phenomena in the body without requiring the additional hypothesis of the existence of chakras (Occam's razor principle).

Consequently, it appears from both experiments that some biological parameter variations are indeed being measured, but their authors don't demonstrate the relationship between these parameters and the activity of the chakras. So their results could be explained by electrical phenomena occurring in the body, as seen in electroencephalograms or electrocardiograms, thus without the need to acknowledge the existence of the chakras. Hence it appears that without knowing the intimate nature and the mode of operation of prana, we cannot determine which biological parameters should be related to chakra activity. In the same way, we have no indication of the sensitivity level which would be necessary to measure these parameters. As Motoyama cautiously wrote: "these observations suggest indirect scientific support for the existence of the chakras in that the activation and awakening of the chakras may have led to activation of the autonomic nerves and the organs that are supposedly connected with the chakras" (Motoyama, 1981).

It seems, therefore, if not vain, at least extremely delicate to try and gain access to the chakra's subtle energy by employing such indirect measurements (Liu, 2018).

It would therefore be premature to measure, with any kind of device, a phenomenon whose very nature and mode of action in its environment are still unknown. It would be a bit like trying to record colors with a microphone. Consequently, to my knowledge, no fully satisfactory scientific experiment has convincingly demonstrated the existence of chakras, and, even less, enabled us to define their nature.

In the same category of observed effects attributed to chakras, we find experiments dedicated to healing through the bioenergy field (Hunt, 1996; Liu, 2018). This kind of assessment suffers from the same weakness: How can we know that the healing process under scrutiny has a specific action on chakras? It is well-known that the placebo effect could account for observed pain relief (Jain & Mills, 2009). In such situations, the part played by chakras in the healing process is not clearly defined (Tsuchiya & Motoyama, 2009).

The second category of chakra assessment methods comprises such theoretical frameworks as, e.g., the one given by Shang and extended later by Maxwell (Shang, 2001; Maxwell, 2009). They propose to associate chakras with embryological organizing centers in the central nervous system. They state that gap junctions can be activated by brain mechanisms and then induce an impression close to the one felt by yoga practitioners. This theory tries to relate chakra sensations to physical structures inside our bodies: Willful concentration on points associated with chakras within the autonomous nervous system induces

a change in activity in centers within the central nervous system (CNS), that could represent "the physical base of the chakras, the physical structure most immediately connected to subjectively perceived chakra activity." This theory thus suggests that chakras are not non-physical structures, really existing on their own, but rather that they are subjectively built in our mind when stimulating physical parts of our body. While this theory provides a possible way of explaining the belief in chakras, it suffers from being only an analogical reasoning that remains to be proved true. Until then, it is only a speculative theory.

The other pitfall of such theories is that they fall short of explaining some facts or experiments not yet fully understood: the alleged distant action of chakras as described by Motoyama (1981) or the fact that a chakra can be felt without requiring the subject to be fully concentrated on it. It thus appears that existing theories do not account for all empirically known facts. At the same time, a broader corpus of numerous, varied, and well-documented empirical facts is lacking to bring to light their commonalities and then to inspire future theories. It seems indeed difficult to develop further such theories before having a thorough description of chakra behavior in all sorts of conditions.

The third method to prove the existence of chakras could be to analyze various testimonials from, e.g., yoga or Qi Gong practitioners. However, there are many limitations to this approach:

—chakra perception may differ from one subject to another, for example, Motoyama (1981) did not agree with Leadbeater's account (Leadbeater, 1927) of the symbolic aspect of chakras. The difference observed between practitioners may also be explained by different sensory sensitivities: Some individuals, like the author, are more tactile whereas some others may be more visual.

—human testimonials are subjected to many potential drawbacks: the difficulty in expressing one's feelings, the prejudices and expectations coming from cultural representations, and the difficulty in obtaining reliable testimony (Loftus, 2003; West & Meterko, 2016).

From all these considerations, testimonials cannot be assigned an objective value and be considered scientific evidence of chakra existence. To this end, specific psychometric scales are yet to be designed and applied (Liu, 2018). Nevertheless, individual sensations could be used as an empirical knowledge base on which a scientific experiment may be designed, as was done in the past (Motoyama, 1981), or on which new theories could be built.

In conclusion, using measurement devices, elaborating a theory, or analyzing testimonials seem to be weak methods of chakra assessment, given the current state of our understanding of chakra subtle energy.

Hence, it appears crucial to follow a research program that would first establish the reality of chakra energy beyond any reasonable doubt, then compile a corpus of observed facts (behavior, interactions), and eventually link together these facts with a comprehensive theory. The main experiment proposal given in this paper logically focuses on the first step of this program, aiming at assessing the existence of the chakra energy field.

This thought experiment could be compared to the EPR one (Einstein et al, 1935) as far as the subtlety of the phenomenon and the practical difficulty are concerned. The EPR experiment was proposed at a time when the authors didn't believe in the nonlocality effects of quantum mechanics. Their thought experiment has taken 47 years to be converted into an actual experiment in a laboratory (Aspect et al., 1982). Important physical experiments have often been preceded by thorough theoretical work and discussions.

PRELIMINARY EXPERIMENTS AND CHAKRA ENERGY BEHAVIOR

Although prana cannot be directly measured or observed, it can be experienced (Liu, 2018).

Apart from the six or seven chakras acknowledged by the Hindu tradition, the Chinese have explored other, smaller, chakras known as acupuncture points connected together through various meridians. The Chinese also developed methods (such as Chi Gong) enabling one to emit chi energy from the hands (see Appendix A for more details). The chi emission is known today as "chi projection" in relation to martial arts, a term used in Shaolin Monks' demonstrations. In contrast to this, no such subtle energy emission methods—to the author's knowledge—were developed in India.

Hence, the main experiment detailed below is designed according to empirical knowledge acquired by the author through his and others' experiences with the hand chakras and some preliminary experimental results. The latter were done to look for a clear picture of chakra energy behavior. The experiments were performed on an individual scale or with one partner.

These experiments are based on the perception of the chakra energy coming out of the Lao Gong point located in the palm, also known as the 8th point of the pericardium meridian (PC8 or PE8) or the 8th point of the heart master meridian. This particular point has been chosen for these experiments because it has traditionally been associated with the projection of chakra subtle energy out of the body in Qi Gong practice and martial arts (Réquena, 1989).

Experimental Descriptions

Various experiments have been performed to understand chi energy behavior. Their protocols are given below, along with the questions that arise from them:

Experiment 1: One Individual

1) Meditation, concentration, deep breathing: going into a state of "inner listening" (5 min);

2) *This step may be skipped as it has proven to have adverse effects on chi sensation for some individuals:*

Intense rubbing of the two palms one against the other in a back-and-forth movement along the direction of the fingers (1 min);

3) Separation of the hands with palms facing one another;

4) With the hands at a distance from one another, what is perceived when the hands come closer to each other, each making a rotational movement in the plane of its palm?;

5) If there is a perception of something during the preceding step: Move the hands away from each other while maintaining this rotational movement, and evaluate any change in perception;

Experiment 2: Two Individuals, A and B

1) Each individual, A and B, follow experiment 1;

2) When the perception of chi is felt by the two, bring the right palm of A closer to the left palm of B: palm A stays a few centimeters above palm B. While rotating the upper hand A around the lower one B, what sensations are felt by A and B? Are they the same?

Experiment 3: One Individual, Different Materials

1) The individual follows experiment 1;

2) Various boards made out of different materials are placed in between the two hands of the individual in such a way that the palms can't face each other anymore. We used boards such as: a glass window, a wood board, an aluminum Dibond plate, and an iPad 2.

3) The two hands, with the plate in between, are moved closer together and then farther apart from one another. Each hand stays at one side of the board, rotating or moving closer and farther away as in Experiment 1 to enable chi energy perception. Is chakra energy felt through some materials? If so, which materials allow the chakra energy to pass through?

Preliminary Experiments Results

From Experiment 1, the chakra energy behavior, as felt by the author, can be described as follows: The energy coming out of the PC8 point feels like a "pressure" exerting a force on the palms that pushes them farther apart. This perception is nearly the same as the one that would be felt if one repelling magnet was put at the center of each palm. Alternately, this perception can also be compared to the one given by a spring which would be inserted between the two hands, each palm being in contact with the opposite

base of the spring. As the hands are moved closer together, the chakra pressure is increased, whereas this pressure is decreased as the hands are moved farther away from each other.

The chakra pressure between the hands is felt with decreased intensity as the hands move farther away from each other, but pressure can still be felt at a distance, as much as 30 cm apart. That distance presumably varies with individuals. From this experiment, we know that it is difficult to infer the behavior of chi energy with distance as one cannot tell if the pressure intensity at a given time is related to the distance only or also to a change in the body condition over time.

From this protocol, we also see that chakra strength perception depends on the moment the experiment is being done: the longer the preceding meditation, the higher the felt intensity, and the better the health and shape of the subject, the higher the perceived intensity.

This experiment also showed that any contact between the two hands during the experiment is detrimental to the chakra energy perception.

Given the perception of a pressure arising between two hands, one might question the term “chakra energy,” as what is felt is more like a force pushing the hands apart than an energy.

It remains to be explored whether there are other parameters influencing the variations of the emission or reception of the chakra field. In the same manner, work must be done to account for external versus internal, body-related influences on chakra field intensity. Nevertheless, not having this knowledge does not impede performance of the main experiment.

From Experiment 2, we can observe discrepancies in the perception of the biofield, as well as differences in the strength of the biofield, among individuals. There are also noticeable variations in the ability to emit or perceive chakra energy from one subject to another. From this experiment, it is confirmed that the perception of the biofield is disturbed when the hand of one individual touches the hand of the other, or when it is in contact with any other object.

From Experiment 3, we see that chakra pressure can be felt through the various boards used without any noticeable alteration: Neither a decrease in intensity nor an energy deviation from the straight line joining the two palms has been perceived. That leads to the conclusion that the chakra energy field cannot be of an electromagnetic nature, otherwise it would have been stopped by the metal plates. For the same reason, it cannot be a type of pressure wave, like a sound wave, which would have similarly been blocked by any material board. This biofield cannot be thermal, as it would have been stopped by wood and glass boards in this case.

This experiment demonstrates that chakra interaction with matter is very faint. This sheds new light on the difficulty of direct measurements of chakra energy with

material devices. As the most common materials cannot directly interact with the chakra field, any device built with them would be useless. Any new device-building would require careful design, taking into account these findings by involving, e.g., organic transducers (Tiller, 1993) if relevant. The worst-case scenario would be that the chakra field is composed of known faintly interacting particles like neutrinos which would require a very large detector with dimensions in the tens of meters (Fukuda et al., 2003), not usable at the scale of chakra experiments.

Assumptions about the Biofield Derived from This Experiment and Design Consequences

By combining the above findings with a careful examination of the concepts conveyed by traditional South Asian texts concerning chi (see Appendix A for a summary of these concepts), one can postulate the following hypotheses:

Hypothesis 1: The chakra field called chi can emanate from the hands of some individuals, either naturally or gradually, through practices like yoga, Qi Gong, Zen meditation, etc. Exchanges outside the body (emission-reception) can be carried out using the PC8 point.

Hypothesis 2: Apart from a few rare individuals, the majority of practitioners of these disciplines take several years before being able to feel chi. This postulate is analogous to the one that would be admitted in any other sensory discipline. Indeed, disciplines such as enology or singing have a long and intensive learning curve after validating an initially proven capacity. It would therefore be illusory to search for the perception or emission of chi in average persons as they are scarcely able to perceive it and do not necessarily emit a powerful enough chi that could be detected.

Hypothesis 3: In the same way, it seems logical to postulate that skilled practitioners can be either chi emitters, receivers, or transceivers. We can indeed assume that the emission capacity relies on different abilities than the subtle sensory perception associated with reception, and, in some cases, that the two abilities may be present together.

Hypothesis 4: From the above experiment account, we might infer that the emission/perception of chi energy may weaken over time and distance for a given subject. This implies that participants in an experiment may need to apply a method to “regenerate” their transmitting/receiving capacity regularly (see Appendix A). It also implies that the distance between a chi transmitter and receiver should not be too great.

Hypothesis 5: From the above experiment account, it appears necessary to avoid any physical contact between the experimenters and any other object, otherwise this

perception will disappear. We can see here an analogy with quantum decoherence, in which a microscopic quantum property (entanglement) disappears when there is an interaction at a macroscopic scale (Bacciagaluppi, 2020).

Hypothesis 6: From the above experimental results, it can be inferred that chakra radiation can pass through the most common materials: wood, glass, and metal.

Hypothesis 7: The chakra field is different in nature from awareness. Its properties can be felt and located rather precisely in space, e.g., between two hands. If we encompass telepathy and other like phenomena in awareness, it would be logical to think that awareness is a non-local phenomena as opposed to chakras, which are always represented and felt at precise locations inside and outside the body. One thing they have in common, however, is that both awareness and chakras interact very faintly with matter.

All these hypotheses enable one to draw guidelines for the design of the main experiment:

—Hypothesis 2 allows us to define the conditions of the selection of persons to be included. Just as humans are not equal in terms of sensory perceptions (not everyone can become an outstanding oenologist, or a “nose” in the fragrance industry, etc.), there is no reason why we should all be equal in other areas of perception. The same goes for the ability to emit or perceive chakra energy.

—Hypothesis 3 allows us to define the role to be assigned to each person in the experiment to be conducted. In the context of an experimental protocol aimed at verifying the possibility of perceiving chi, it will be of interest to ideally associate a powerful emitter with a very sensitive receiver. The most unfavorable setup would be pairing a weak emitter with a very insensitive receiver.

—Hypothesis 4 allows us to define one of the stages of the experiment, namely the regeneration step, enabling chakra energy perception during the entire course of the experiment.

—Hypotheses 5 and 6 allow us to define the material building conditions of the experiment.

SELECTING THE BEST CHAKRA ENERGY EMITTERS AND RECEIVERS

As is known from any other sensory perception experiment, e.g., wine sensory perception (Yang & Lee, 2020), such studies must be performed with a trained or expert panel, with practice-based experience in the field. Schmidt employed the same selection process, i.e., testing the best-performing subjects during his study of the micro-psychokinetic influence on a random number generator (Schmidt, 1971). According to the methodologies used in these fields, a selection process comprising three

successive steps has been established to ensure that the selected panel will have good perceptive and/or chi-emitting abilities:

1) Identify groups of people likely to have good chi-emitting or chi-perceiving abilities, through a relevant and regular practice (Zen, yoga, Qi Gong, Tai Chi Chuan, religious meditation, etc.) spanning many decades.

2) Within these groups, question the practitioners on their ability to emit/perceive chakra energy chi. Ask them to perform Experiment 1 described above and ask them to describe their sensations. Select the practitioners whose feelings can be used in the main experiment.

3) Meet these candidates and apply the test described in Appendix B.

The difference between the abilities to emit or perceive chakra energy can be explained by the awakened state of each participant: Subjects with awakened lower chakras are believed to be of the receiving type, while subjects with awakened higher chakras are associated with the emitting type (Motoyama, 1981). After performing this preliminary test, and if the result is conclusive, the candidate should then be labeled either a “good emitter” or a “good perceiver.” Some could perform equally well in these two categories, and then be labeled both as “good emitter and perceiver.”

During the third step mentioned above, it is necessary to define a benchmark to which the first candidates will be compared. The author will serve as a reference for the first instance, changing this standard to the best candidates in both categories as the panel size increases.

MAIN EXPERIMENTAL PROTOCOL

Experimental Setup

Through completing the previous selection process, it is assumed that at least two participants were selected for the main experiment. One has been labeled “best chakra energy emitter” among the emitters’ panel while the other has been labeled “best chakra energy perceiver” among the perceivers’ panel.

These two practitioners are placed in two separate and insulated booths so that no information of any (known) nature can be transmitted from one booth to the other: sound, vibration, and electromagnetic (Faraday) insulation are provided. Each one of these rooms hosts one person. The two participants are separated from one another by a laminate wall. In this wall, 5 “interaction zones” are defined (Figure 1). Each interaction zone is made of several layers, parallel to the wall surface: a glass plate facing booth 1 (for thermal insulation), a white sheet of paper marked with a symbol and facing booth 1 if the perceiver is there, a metal plate (electromagnetic insulation), a white paper sheet

marked with a symbol and facing booth 2 if the perceiver is there, a glass plate facing booth 2 (Figure 2). Each glass plate is properly sealed to the flat interface wall (e.g., with a silicone seal) so that no light can be seen from the other side. Each interaction area must be wider and higher than one hand to avoid any possible confusion. The general layout of the experiment is shown in Figure 3.

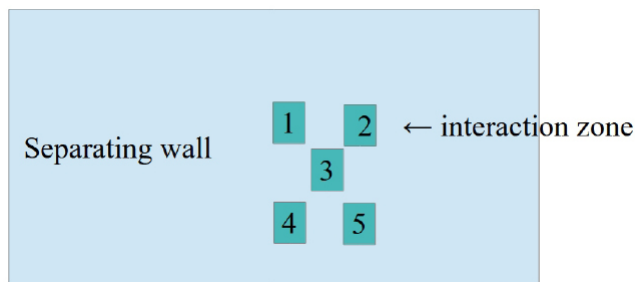


Figure 1. Wall separating the two participants seen from the front side.



Figure 2. Side view of the separating wall at one of the 5 “interaction zones.” Glass (green), paper sheet facing either the left or right side (hatched white), metal wall (black), and glass (green). A thermal insulating layer may be added if necessary.

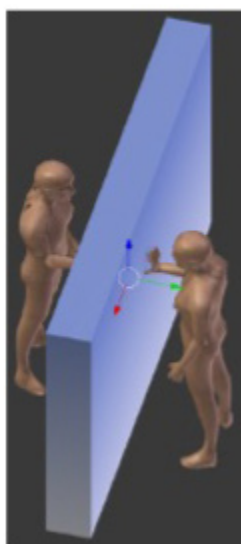


Figure 3. Location of the two participants on either side of the separating wall.

Eight cameras temporally synchronized with each other film the booths, that is four cameras per booth. In order to avoid any blind spots, these cameras must be located as follows:

- a first camera attached to the ceiling grabs the experiment from above;
- a second camera attached to the wall to the right side of the participant grabs the experiment as seen from the right side of the booth;
- a third camera attached to the wall to the left side of the participant grabs the experiment as seen from the left side of the booth;
- a fourth camera attached to the rear wall a few meters behind the participant’s back grabs the experiment as seen from the back of the participant;

The 4 cameras visualizing a booth must be strictly identical. The synchronization process is done by automated electronic means like sharing a time code, using an electronic trigger, or by having a light source flashing a Gray code.

The cameras must have a resolution high enough to be able to identify and grab:

- the symbol corresponding to the LED randomly lit up on the emitter side;
- the location of the hand of the emitter when it is put in front of the interaction zone;
- the location of the receiver’s hand in front of the perceived interaction zone;

Other measuring means can be included to monitor sound or vibrations in both booths (broad-spectrum analyzers, radio frequencies analyzer, etc.). Thermal cameras can also be added to both booths to ensure no thermal bridge connects one booth to the other.

Additionally, the hands or whole bodies of the participants could be imaged (X-rayed, terahertz, thermal, visible, or else) before and after the experiment to detect any possible change or bias that may have occurred.

Finally, insulation of the participants from vibrations transmitted through the ground must be provided, either by applying a special absorbing material or layers of different materials between the participants and the ground or by splitting the ground into two mechanically independent parts, or by applying both methods.

Experimental Procedure

To ensure objectivity and uniform randomness for this experiment, the whole protocol is monitored by a computer. This computer hosts a program whose source code could be published.

Each individual detection test is performed in the following way:

—The algorithm hosted in the computer randomly chooses an interaction zone number;

—The computer lights up the LED located above the interaction zone previously chosen;

—Participant E (Emitter) is then asked to put his hand over the interaction zone indicated by the lit-up LED. Note: the light from the indicating LED must not be perceived from the other booth. When E is ready, a signal is given to inform the computer, either vocally or by any other means.

—Participant R (perceiver) is then asked by the computer to try and determine which interaction zone is located in front of E's hand. To perform this task, R scans each possible interaction zone at will. When the correct zone is thought to have been detected, R pushes a button corresponding to the identified zone. Neither E nor R must touch the separating wall during the process nor communicate by any means.

A pause enables the participants to concentrate, meditate, or rub their hands to regenerate their sensitivity.

The computer repeats 16 times this individual detection test through LED indications of randomly chosen interaction zones. A series of 16 symbols is then built this way, corresponding to the symbols on the white sheets located at the interaction zones that had been randomly chosen.

The whole experiment will be automatically driven by a computer without the need for any human intervention. Using, e.g., an image-processing algorithm or ultrasonic range-detection sensors, the monitoring computer will be able to record the result of each individual detection test, thus providing a final score at the end of the whole experiment and indicating the statistical relevance of the final overall result. This fully automated experiment ensures that no human intervention is required from either the participants or the researchers, thus making this study a double-blind experiment.

The experiment will be supervised by experimenters recognized as agnostics toward the subtle energy concept. Their degree of agnosticism could be measured, e.g., on a Likert Scale. The full automation of the experiment and the measure of the degree of agnosticism will ensure that the experimenter effect is avoided.

The test will be considered conclusive when the hands are face-to-face, with an offset to be defined, not exceeding the size of an interaction zone, as shown in Figure 4. The test will fail if the hands are offset by a distance greater than a predefined threshold, as shown in Figure 5.

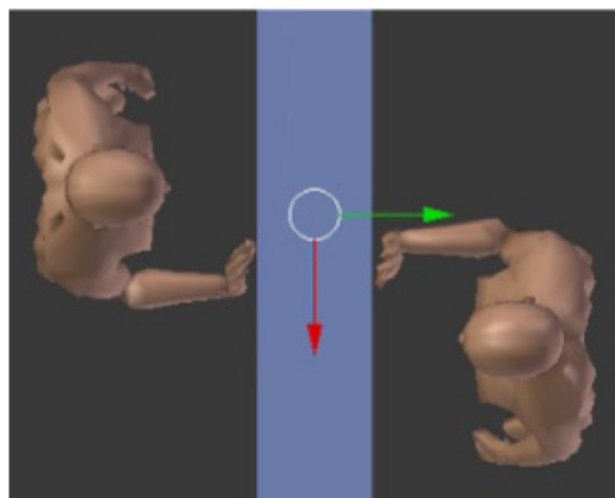


Figure 4. Hands facing each other, conclusive test.

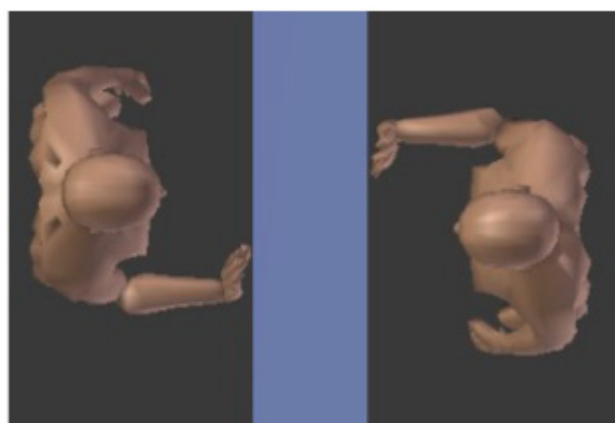


Figure 5. Hands too far apart, inconclusive test.

Duration Estimation

We can estimate the total time span of the experiment with the following, e.g., duration hypotheses:

- 2 min for E to put the hand over the required symbol and be ready;
- 1 min of scanning per symbol for R, followed by 1 min of regeneration, and this 5 times for each scan, i.e., $2 \times 5 = 10$ min per scan;
- 3 min of relaxation between individual tests.

Under these assumptions, the time duration would be 15 min per individual test. For a total of 16 tests this amounts to $15 \times 16 \text{ min} = 240 \text{ min} = 4 \text{ h}$. Taking into account necessary body movements and physiological needs, the duration of the total experiment can be estimated to be around 4 h 30 m. To experiment in the best conditions, e.g., to avoid a drop in the emitting or perceiving ability, it would be advisable to discuss the preferred schedule with the subjects.

Statistical Analysis of the Main Experiment

The experimental design satisfies the conditions of a Bernoulli experiment, where $N = 16$ is the total number of trials and $p = 0.2$ is the probability of success for each trial. The expected number of correct answers if the receiver is randomly guessing is then, according to binomial law: $E(X) = 16 \times 0.2 = 3.2$. The expected results according to the binomial law are given in Table 1 below:

TABLE 1. Success Probabilities for the Main Experiment

A	B	C
Number of K Successes:	Probability of obtaining exactly this number of successes $P(X=k)$:	$P(X \leq k)$:
0	1,24E-003	1,238E-003
1	9,28E-003	1,052E-002
2	3,37E-002	4,418E-002
3	7,85E-002	1,227E-001
4	1,33E-001	2,552E-001
5	1,72E-001	4,275E-001
6	1,79E-001	6,070E-001
7	1,54E-001	7,608E-001
8	1,11E-001	8,713E-001
9	6,76E-002	9,389E-001
10	3,55E-002	9,744E-001
11	1,61E-002	9,905E-001
12	6,38E-003	9,969E-001
13	2,21E-003	9,991E-001
14	6,71E-004	9,998E-001
15	1,79E-004	9,999E-001
16	4,19E-005	1,000E+000

The null hypothesis H_0 in this statistical analysis can be stated as: "Test results are obtained by mere guesses," while the H_1 hypothesis is then: "Test results are explained by the genuine detection of chakra energy through the wall." For a sample size of $N = 16$ detection tests, Table 1 shows in bold font the minimal number of successes to reject H_0 at the standard significance level of 95%. Hence, if 10 or more detection tests succeed out of 16, we reject H_0 and can assume H_1 is true, that is, the chakra energy field has indeed been detected through the wall.

CONCLUSION

The attempts at demonstrating chakra energy existence suffered in the past from various weaknesses. After having performed preliminary experiments on

himself and others, the author has identified some chakra energy behaviors that have been used to design the main experiment described here. This experimental protocol addresses the drawbacks of past experiments by ensuring objectivity and specificity. Objectivity is reached by the double-blind nature of the experiment. Indeed, all the monitoring, controlling, and collecting of the results, including the resulting statistical analysis of the data, are done by a computer in a fully automated way. Specificity is ensured both by unambiguous sensing of the chakra energy field and by insulation from all other types of energy disturbances (thermal, electromagnetic, mechanical, etc.).

Two main tasks have to be carefully completed to properly build this experiment: the selection of a panel of skilled subjects and the technical developments required for trial automation. The experiment proposed here could be further extended by testing two groups: one with skilled people and another one with people who have never practiced chi techniques.

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APPENDIX A: TRADITIONAL CONCEPTS ON CHI/PRANA

According to Chinese tradition (Réquéna, 1989), methods such as meditation and breath control allow the accumulation of chi in an “energy tank” called the lower dantian. This corresponds to the hara referred to in the Japanese tradition. The practitioners thus “refill” their chi tank as if they were batteries. Any discharge of chi during an experiment requires, therefore, an equivalent refill of this tank to ensure a constant level of chi.

To illustrate this, Réquéna wrote: “To fill one’s dantian completely requires 81 hours of deep meditation,” and “If he meditates daily, at the rate of one hour, it will take him about ten years to fill his dantian.” These figures seem to be overly precise. They can be taken as an order of magnitude, the time necessary to enter into deep meditation, depending on each practitioner.

Traditionally, chi is considered as a flow of energy that can enter and leave the body at different points: “Another type of qi is external qi, which can be emitted from the body by some individuals, such as Qigong practitioners” (Liu, 2018). Thus, before attempting to emit chi, it is necessary to know its points of emission (Motoyama, 1981). The emission of chi requires the subject to be concentrated on a specific meridian, depending on the desired location of the point of emission. Thus, an emission by the palm area corresponds for example to the eighth point of the meridian of the pericardium meridian or heart master, called “lao gong” (PE8) (Figure A.1). The practitioner wishing to emit chi at this point will therefore mainly focus his attention on this meridian. Unlike meditation, which can aim to fill or refill the chi tank, and which is essentially a state of mind of “emptiness,” the training toward chi emission necessitates focusing one’s attention.

As far as the perception of chi is concerned, it is mainly associated with the development of the subtle sense of touch, in the case of tactile sensitivity. More precisely, in



Figure A.1. Part of the meridian system in the hand.
(Meridian System, 2010)

the Samkhya philosophy, the subtle senses of perception are called Jnanendriya. For example, the Jnanendriya corresponding to the sense of subtle touch is called: “tvak.” The development of a subtle sense of perception is specific to each person: Not all of us can develop such a sense to the same degree of sensitivity as other people. There is therefore for each person a hierarchy of subtle senses in the same way that there is also such a hierarchy for our five physical senses.

APPENDIX B: PANEL TEST SELECTION

The candidate selection test goes through the following steps:

1) Meditation, concentration, deep breathing: putting oneself into a state of “inner listening” and mental emptiness;

2) Intense rubbing of the two parallel palms of the same person in a back-and-forth movement along the axis of the fingers;

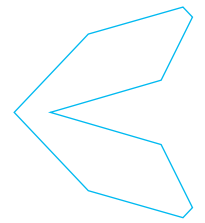
3) Separation of the hands when they are face-to-face;

4) Attempt to perceive first of all with the hands close to each other, each making a rotational movement in the plane of the palm;

5) If there is perception at this stage (feeling of a “pressure” exerted upon the palm): Move the hands away from each other while maintaining this rotational movement to confirm if the perception is still present at a greater distance;

6) When the pressure is still felt distantly, bring the right palm (A) closer to the left palm (B) of a second person who has followed the same preceding procedure: Stay a few cm above this palm B.

7) At this stage of the test, participant B may be prevented from looking at the hands, or this part of the test may be performed in an opaque enclosure. With palms A and B parallel to each other, apply a movement with palm A relatively to palm B, while palm B remains still. Ask B if a variation is felt. Note if the variation felt by B agrees with the palm A movement.



ESSAY

How to Think About the Astrology Research Program: An Essay Considering Emergent Effects

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HIGHLIGHTS

A review of recent astrological research and a meta-analysis show a methodical program that is tackling problems and improving results in terms of quantifiable correlations and effect-sizes. The value of the program is not just to test the truth of standard astrological taxonomies but to understand, along with other disciplines, the process of how effects emerge from complex systems.

ABSTRACT

As it has been shaped by improvements in its tools and methods, and by its discourse with critics, I describe how the astrological research program has advanced through three stages of modelling and design limitations. Single-factor tests (for example, the many Sun-sign-only experiments that have been published) are typically underdeterministic. Multi-factor tests, unless they are very well designed, can easily become overdeterministic. Chart-matching tests have been vulnerable to confirmation bias errors until the development of a machine-based, whole-chart matching protocol that has objectively produced evidence of high effect-sizes. A meta-analysis of recent results shows the rapid advancement and how to further improve the results. The value of the program is not only to corroborate the taxonomic counterfactuals of astrological “cookbooks,” but to extend their explanatory reach by the comparison of astrological postulates and inferences with philosophies in other disciplines in terms of quantifiable processes and emergent effects.

KEYWORDS

Astrology, emergent properties, effect-sizes

INTRODUCTION

Quantitative research in astrology did not begin in earnest until the mid-twentieth century and has depended on statistical research tools and computational power to adequately look into the claims of the astrology postulate. By the term astrology, I mean as a definition the study of the positions and motions of celestial bodies in relation to the character of lives and events. By the term postulate, I refer mainly to the applied principles and applied theory documented in astrological textbooks, the so-called *cookbooks*. Some examples of modern cookbooks are: Sakoian and Acker’s *The Astrologer’s Handbook* (1973); Richard B.

Vaughn’s *Astrology in Modern Language* (1985); and Margaret Hone’s *The Modern Text Book of Astrology* (1978).

The word astrology comes from the Greek (*astr* + *logos*) loosely meaning “star word” or “star speech.” Modern cookbooks carry on the tradition from antiquity of organizing astrological properties as a semantic taxonomy of interpretations.¹ Each planet’s position in the sky is interpreted by the categories of: its sign; its diurnal house (a 12-fold frame of reference affixed to the local horizon and meridian); and its aspects (its angular distance to the other planets). For example, a cookbook-described position would be for: Mars in Sagittarius; Mars in the Ninth House; and Mars opposite Moon (with Mars and the Moon on opposite



sides of the Earth, 180° apart). Astrology presumes *emergent effects* from the consequential combinations of these astrological factors.

Most astrological research concerns *Natal Astrology*—the study of birth charts. A birth or *natal chart* is a sky-map positioned on the birth of the individual, called the *native*, as a microcosm at the relative center of the Solar System, and in the greater macrocosmic sense, at the center of the universe. Hence, the *native's planets* (including the Sun and the Moon) are relative planets because they, in a fashion, move around the native, as does the native's universe.² A natal chart is evaluated semantically for the native's potential characteristics and experiences, and how these are astrologically influenced, mainly by day-to-day interactions with other natives—who represent parallel universes or parallel worlds so to speak.³ There are other branches of astrology (deVore, 1947, p. 29) such as *World or Mundane*, that study eclipses, ingresses, and major planetary cycles with regard to populations. And there are *Horary* and *Electional*, which study propensities at the moment of a query, idea, or event (*Horary*), or seeks to optimize the time and place for a specific event in the future (*Electional*).

The research program can be understood in terms of what I will call three stages of experimental complexity. I will introduce them briefly here before giving examples in subsequent sections. The earliest stage, which first suggested quantifiable evidence of astrological effects, relied on relatively simple *single-factor* experiments. These consist of correlational tests of planetary features as a single factor and the corresponding theoretical interpretations that might be categorized, for example, under a single section in the cookbooks. Next came *multifactor* experiments that evaluate several chart factors in combination, postulated as a model or *signature* of an observable feature of the natives who have it. Most recently, are *whole-chart* automated simulations that evaluate all the combined factors in natal charts. All three of these experimental methods have specific uses within the research program.

The development of single-factor and multifactor protocols included identification of astronomical and demographic artifacts that would confound the measurements of astrological effects. The developed protocols include data randomization methods that generate neutral control groups to evaluate significant correlations (Gauquelin, 1988; O'Neill, 1995; Ertel, 1995; Ruis, 2008; Tarvainen, 2012).

Single-Factor Experiments

The best-known examples of single-factor experiments are the large-scale studies of eminent professionals done by French researchers Michel and Françoise Gauque-

lin (1955, 1975). Guided by traditional interpretations, Michel Gauquelin initially tried to correlate astrological properties (from the cookbooks) with the natal charts of famous professionals whose timed birth data he could obtain. The main groups tested were: athletes; actors; scientists; doctors; artists; writers; corporate executives; military leaders; musicians; and politicians. When Gauquelin did not immediately find any clear effects, he experimented by dividing the four diurnal quadrants into finer slices of 36 and 18 sectors as well as the customary 12 Placidus houses.

Gauquelin's research led to the discovery of what he called *keysectors*, which are two slices of sky within which he found that certain planets (Moon, Mars, Jupiter, or Saturn) correlate significantly to attainment of eminence in their astrologically associated professions. The data peaks of the keysectors are located just after rising above the eastern horizon and just after culmination at the upper meridian. The inference of professional prominence due to the planetary placements in these sectors became known as the *eminence effect*. Because achievement in sports is measured exactly and Gauquelin found the Mars-key-sector sports correlation to be especially strong, and because there is a constant supply of young athletes to use as subjects, Gauquelin recommended that replication experiments test eminent athletes for Mars in keysectors.

The Mars-athletes replication tests proved to be a battleground with many experiments conducted and accusations of sampling bias from both sides over what qualified as professional eminence (Ertel & Irving, 1996). The controversy has diminished, however, following a critical study by Professor Suitbert Ertel (1988) that objectively ranked the eminence of famous athletes in the entire sample that had accumulated ($N = 4291$) by a frequency of 1 to 5 based on whether they were cited in five sports reference books.

Ertel found that the Mars-eminence effect diminishes for each lower rank of athletes in a near-linear fashion. Compared to a randomized control group, the "monotonic trend with ranked qualitative data" (p. 71) demonstrates a very low probability against chance of $p < 0.005$ (where $p < 0.05$ is considered to be significant in the social sciences). To show the size of this effect, Ertel calculates Kendall's Tau ($\tau = 0.037$) as the correlation coefficient of the ranks (where perfect correlation is 1). This calculation indicates a quite weak effect, although this is not surprising as it is the evaluation of a single astrological factor among the many possibly related factors in a chart that could be contributors. The significance of Ertel's finding comes from the very low probability of the ordered ranks occurring by chance: ($N = 4291, p = 0.005, \tau = 0.037$).⁴

Most astrological experiments, however, do not measure ranked results as in Ertel's example, and other evaluations of effect-size (ES) would apply. Until recently, ES has

not been included in astrology studies (nor in most scientific studies) and it is proving to be a highly useful metric, as I will show. There are various methods of calculating ES, and the one applicable for most astrological experiments (Currey, 2022) is the Pearson product-moment correlation coefficient between pairs of variables, r (Cohen, 1988, p. 75), where $r = 1$ is perfect correlation, as used in the remaining examples of this article.⁵

A more typical design of a single-factor experiment is one by astrologer Paul Westran (2021). Westran studied 1300 romantic relationships of famous people (2600 natal charts) in terms of *synastry*—the mutual alignments between two natives' charts. This study looked for correlations between the starting time of a relationship or marriage and the transit or secondary (day-for-a-year) progression aspects of the Sun and Venus between the partners' charts.⁶ The results show an extraordinarily high significance for the Sun/Venus aspects that are traditionally conducive of intimate relationships (*conjunctions*, *trines*, and *oppositions*) compared to a control group of the same size ($N = 5200$, $p = 4.76 \times 10^{-11}$, $r = 0.09$).⁷

These examples give an idea of how single-factor experiments can work to find a specific astrological value, thereby reducing ambiguity in the result. But single factors have limitations because they tend to require very large samples and they ignore all the other factors in the natal charts, resulting in weak effect-sizes. To say that any single factor must be definitive in the lives of the natives who have it seems an extraordinary claim considering that there are always other factors in a natal chart that can have somewhat similar values and effects. Indeed, most professionals who have attained eminence in their fields do not have their Gauquelin-correlated planet in either of the two keysectors. If we were to seriously consider emergent effects, then we need to include other astrological factors that contribute to the recipes of correlational outcomes. Indeed, we can typically find many suggestions of such related combinations scattered among the single-factor descriptions in the cookbooks.

It seems to me that single-factor testing is susceptible to *underdetermination*, meaning that a single factor is not necessarily sufficient to evaluate an astrologically significant effect. The listings in the cookbooks suggest that a multiplicity of factors in any natal chart are assumed to converge, intersect, or otherwise blend together to produce emergent results. Yet, this critical assumption has been ignored by hundreds of single-factor experiments, including a disproportionate number of Sun-sign-only studies (e.g., Dean et. al., 2016; Helgertz & Scott, 2020), and Moon-phase only studies (Marko, 2017), many of which have been done with unrealistic expectations and have led to disappointing results (Houran & Bauer, 2022). The

evaluation of emergent effects would seem to entail an additional approach—a multifactor testing or some variation of multiple regression, and these are methods that the research program also explores.

Multifactor Experiments

By relating, blending together, and modelling some of the factors in a natal chart into what we might call astrological *signatures*, multifactor experiments overcome the problem of underdeterminism. This approach tries to identify tell-tale combinations of natal chart factors that have either similar or antagonistic tendencies that we would presume to amplify, diminish, or otherwise moderate a theme of given characteristics in a native. To give a simple two-factor example observed by the Gauquelins, keysector Mars positively correlates to athletic eminence and yet the Moon in a keysector is antagonistic and negatively correlates to the athletic effect (Gauquelin, 1988, p. 144). The Moon appears to *moderate* the Mars effect, which is consistent with the astrological properties of the Moon. Many suggestions as to how some factors moderate other factors and impose contingencies on interpretation as to what may manifest are scattered throughout the cookbooks.

The problem with multifactor testing is that it can easily suffer from nomological *overdetermination*, which is the opposite problem of single-factor testing. This is where there are too many similar and potentially sufficient factors according to the documented rules in the literature to easily sort out exactly which astrological features are responsible for which experienced effects. A few authors have compiled interpretations of combined chart factors, although such works are rare because of the semantic complexity of blending the many potential factors in a chart. To help accomplish this, the verbose descriptions typical of single-factor interpretations are conceptually condensed to very brief statements. For example, in German astrologer Reinhold Ebertin's (1940) classic *The Combination of Stellar Influences*, single-factor and combined-factor descriptions are listed with just a few short phrases and keywords to be used as building blocks.

In view of the overdeterministic limitations, a multifactor experiment would try to identify a characteristic feature of interest in a homogeneous sample of subjects and combine only a few well-defined, appropriate descriptions from the cookbooks to test as a hypothetical model of the feature. The modelling could include such common manipulations as applying planetary "weights" where, for example, the Sun and Moon are given more weight and the outer planets are given less weight. Planets with astrological properties that suggest dominance in an effect

can be tested with more weight to better assess their contribution. Such treatments or interventions of a sample would seem to have the best chance of corroborating and improving the cookbooks. Of course, this is not to say that completely new theories cannot be usefully tested and explained. Let me give some example studies of how multifactor modelling has been done.

As written in virtually all astrology textbooks, Venus and the sign Libra, over which it is said to “rule” (being the sign most consonant with the planet’s characteristics), and Jupiter and its rulership sign Sagittarius, are associated with judges. A multifactor study modelled on these associations by British astrologer Robert Currey (2021a, 2021b, 2022) tested the natal charts of 115 justices of the Supreme Court of the United States (SCOTUS) appointed since 1789. The frequency of astrological combinations of these two planets, whether by occupying their own or each other’s sign or house, or by their astrological conjunction, shows a significant correlation to the textbook theory ($N = 115$; $p = 4 \times 10^{-4}$; $r = 0.31$). Currey’s test corrects a claim against astrology by author Alexander Boxer (2020, pp. 86–89) that concluded from a single-factor test that there was “no correlation” between any Sun sign and SCOTUS justices, including Sun in Libra, which had been Boxer’s chosen astrological hypothesis.

Another multifactor study by Currey (2017) uses Eysenck’s Personality Inventory (EPI) and also corroborates astrological theory. The model semantically matches the EPI trait words for Extraversion [E] and Neuroticism [N] to the corresponding keywords for the astrological elements (Fire, Earth, Air, and Water) drawn from the texts of well-known astrologer authors. The multifactor keywords are from the interpretations given for the positions of the Sun, Moon, and Ascendant, which are traditionally the most personal chart factors and make a suitable model for such a test.

The results of Currey’s EPI study show that participants who scored high in Extraversion [E+] and low in Introversion [E–] were high in Fire signs and low in Earth signs ($N = 216$; $p = 0.009$; $r = 0.16$). Participants who scored high in Emotional Stability [N–] and low in Neuroticism [N+] were high in Air signs and low in Earth signs ($N = 216$; $p = 0.007$; $r = 0.17$). These results corroborate the cookbook interpretations. Currey’s test used original data provided by Geoffrey Dean (1985a, 1985b, 1986), who had claimed that his experiments showed no astrological correspondence to EPI results that are better than chance.

A study by mathematician Kyösti Tarvainen (2013) of professional mathematicians uses 25 natal chart factors that do not require birth times (which were unavailable for the sample) that are favorable to the profession based on a standard cookbook (Sakoian & Acker, 1973). The factors

are significantly more frequent in the mathematician group than in a randomized control group ($N = 2759$, $p = 0.03$, $r = 0.04$). The low effect size (r) of this result increases for the same factors in a much smaller subgroup of only those individuals who had won a prestigious prize in mathematics ($N = 99$, $p = 0.04$, $r = 0.18$).

Having some reliably significant although modest results in multifactor tests makes it possible to intervene in the same tests by substituting various claimed astrological theories, techniques, and settings to determine whether they fare better or worse against the best evidence so far. A descriptive summary of such substitution tests done by various researchers (Tarvainen, 2021a) includes comparisons of tropical versus sidereal zodiacs (where the tropical zodiac, which is based on the solstices and equinoxes is compared to the *Lahiri ayanamsha* sidereal zodiac that is traditionally used in Indian/Jyotisha astrology). Other comparison tests include: various diurnal house systems; sizes of orb settings (the margins of influence near an alignment); various midpoint configurations; and various synastry techniques. These evaluations are in the early stages but hold promise as I will show with an example later.

Whole-Chart Matching Experiments

To avoid the underdeterministic limitations of single-factor experiments, and the overdeterministic excesses of multifactor experiments, some of the research in the post-Gauquelin era has been drawn to whole-chart matching experiments. These tests do not discriminate any specific traits or characteristics but have been used simply as a verification test of whether astrology can work without describing how. Typically, these are blind tests that challenge astrologers to match natal charts to the biographies or personality test scores of their owners. Chart-matching experiments have been touted as the ideal test of astrology because: the subjects can be ordinary people; all factors in the chart are used; there are no demographic or astronomical artifacts; there is no need for control groups; and the statistical analysis is simple (Godbout, 2020).

The first notable blind matching tests were done between 1959 and 1970 by psychologist Vernon Clark (1961, 1970). For example, one of his experiments tests the efforts of 50 professional astrologers and a control group of 20 psychologists and social workers. All participants were asked to match the descriptions of 10 professionals with their charts, given the choice of the genuine chart and a bogus chart for each. The control group successfully matched 50% of the sample, as expected by chance. The astrologers matched 65%, which is significant ($N = 500$, $p = 1 \times 10^{-4}$, $r = 0.17$).

Despite this promising beginning, serious researchers have been reluctant to do chart-matching tests due to the organizational, logistical, and discomfiting issues of astrologers challenging their own colleagues. Typically, researchers have preferred to quietly develop their own theories and evidence by working independently.⁸ Also, while matching tests may be interesting as a game or a contest, they have not been regarded as adding explanatory value. This is because the Vernon Clark protocol blends the astrological interpretations of participants as an aggregate or a *black-box* result that does not expose the fine-grained *effective information* (Wolchover, 2017) on theory and problems where we think the emergence of astrological properties, effects, and agency can be traced. The usual multifactor models seemed to hold more promise for analysis than whole-charts. The resulting state of affairs left the door open for astrology critics who designed their own Vernon Clark tests, chose the participants and informed them as they saw fit, did their own analysis, and drew their own conclusions.

Like the earlier Gauquelin tests of Mars and eminent athletes, chart-matching tests soon became a battleground over questionable methods and published claims that astrologers did not perform any better than chance (Carlson, 1985; McGrew & McFall, 1990; Nanninga, 1996/1997). However, unlike the Gauquelin controversy, matching tests require neither control groups nor homogeneous samples. Consequently, flaws in the tests are more clearly identifiable. Some of the counter-criticism against the aforementioned tests include: samples that are too homogeneous to differentiate (cherrypicking); improper design and analysis (*p*-hacking); and discarding potentially corroborating data (publication bias) (Ertel, 2009; Currey, 2011; McRitchie, 2009, 2014, 2016). In one study where the test data was published (Carlson, 1985), re-analyses by Ertel (2009), who did the heavy lifting, and Currey (2011), who made further refinements, claim to reverse the results as evidence that supports astrology. Currey's re-analysis found the results to favor the astrologer participants ($N = 115$, $p = 0.037$, $r = 0.1$). Ertel's and Currey's claims of positive results have remained unchallenged. For readers who are interested, the articles published by both sides of the chart-matching controversy are freely available and can be examined and judged in detail.

Having said that, chart-matching tests have recently made an important advance. Astrology software and automated protocols have been developed to make matching tests much bigger and objectively more accurate. The latest evidence suggests that the previous controversies may be moot.

Automated Chart-Matching

Of prominent interest are the automated chart-matching tests of Canadian mathematician Vincent Godbout

(2020) that use an expert astrology software system designed for keyword analysis, called Mastro Expert, and a programmed utility he calls a "Semantic Proximity Estimator" that is similar in function to a "machine scientist" or a *symbolic regression algorithm* (Wood, 2022). Godbout's regression algorithm evaluates chart matches semantically in a blind protocol with samples that are much larger than humans have a capacity to analyze. In principle, this design approach would be the same as a multifactor experiment except it tracks "all" the factors in the sample charts and does not try to discriminate any signature feature or characteristic that the subjects may share in common.

To make the matches, the machine uses the possible instances of about 3,000 keywords drawn from more than 5,000 chart factors that Godbout sourced from the publications of 25 modern international astrology cookbook authors (American, French, British, German, and Canadian). By removing human limitations, the experiments surpass all previous matching tests in terms of safety, size, and difficulty of challenge. The automation also quashes the otherwise hard-to-falsify claim (Dean et. al., 2016) that successful chart-matchings may be due to ESP ability.

In Godbout's (2020, 2021) first automated chart-matching experiment, the machine had to match two separate samples (experimental, $N = 41$, and verification, $N = 32$) of natal charts of famous people by using characteristic keywords (in noun form) drawn from the natives' biographies sourced from *Le Monde* (Subtil & Rioux, 2011). All the biographies were used for which accurately timed birth data could be obtained, which provided the total study sample of $N = 73$ out of the 100 subjects listed in the source book. The only part of the protocol that requires human involvement is the extraction of keywords from the biographies, which is done blindly without knowledge of the astrological charts.

The matches are evaluated by 8 binomial distributions that account not only for the correct identification of a subject's chart as the top-scoring choice but also for near misses where the correct chart is within the top 2 choices, within the top 3 choices, and so on up to the top 8 choices. Thus, for Godbout's combined sample of 73 subjects, the correct identification as the highest-scoring choice has a probability against chance expectancy of $1/73$; within the top 2 it is $2/73$; within the top 3 it is $3/73$, and so on to 8 places. In this manner, the 73 charts are matched against the 73 biographies to determine how many correct matches are found in each binomial bucket of the top 8 choices. The machine identified the correct charts much more frequently than chance expectancy for each bucket. For example (Godbout, 2021, p. 38), the "worst result" was for bucket 2 with 2 expected but 9 observed ($N = 73$, $p = 1.73 \times 10^{-4}$, $r = 0.42$). The best result was for bucket 7 with 7

expected but 24 observed ($N = 73, p = 3.97 \times 10^{-8}, r = 0.63$).

Given the high correlations of this original test to use as a benchmark, Godbout (2020, 2021) ran replications within the same study to test interventions against the astrological standards he used. This is the same approach mentioned earlier in the substitutions studied by Tarvainen. The standards Godbout interfered with are: standard orb settings based on the British Faculty of Astrological Studies (Tompkins, 1989, p. 66); accurate birth times; major midpoints; and the tropical zodiac. The substitution of the most widely used non-tropical zodiac (*Lahiri ayanamsha*) failed to achieve significance. The substitution of tighter than standard orb settings, of rounded birthtimes, and of tests without midpoints resulted in lowered significance. These results suggest not only that the tested existing standards are good but that the method of experimental interventions in whole-chart testing can provide evidence capable of extending and improving the reach of astrological theory in detail.

What the Research Program Looks Like

By entering the walled garden of astrological research and regarding the work as a concerted program of tested models, methods, and data, an overall view of the program begins to take shape. Figure 1 is from a meta-analysis by

Robert Currey (2022) of experiments published between the years 2020 to 2022. It shows a distinctive, logarithmic trend of relationships between sample size (N), effect-size (r), and probability (p). Correlational results that are above the lower dashed curve are greater than the threshold (α -*pha*) of statistical significance, $p < 0.05$. The uppermost curved solid line is the regression trendline of the 10 research findings.

As the plot points in the graph show, single-factor experiments (for example, Westran’s Sun/Venus synastry study, Point 10) can produce very high probabilities given its large sample, although the effect-size for a single factor out of the many available in a natal chart is quite small. Multifactor experiments (for example, Currey’s SCOTUS study, Point 1) combine astrological factors and can produce stronger effect-sizes, a result that begins to suggest *emergent effects*. But the strongest evidence for emergent effects is from whole-chart matching experiments (for example, Godbout’s automated tests, Point 6) that can produce both a high probability and a large effect-size.

For some studies, the classification of whether a test is single-factor or multifactor is a bit loose at this stage as astrology is a complex system, but for this meta-analysis we will consider that the single-factor tests are: 4, 5, 7, 8, and 10; the multifactor tests are: 1, 2, and 3, and the whole-chart tests are 6 and 9. See Table 1 for further details.

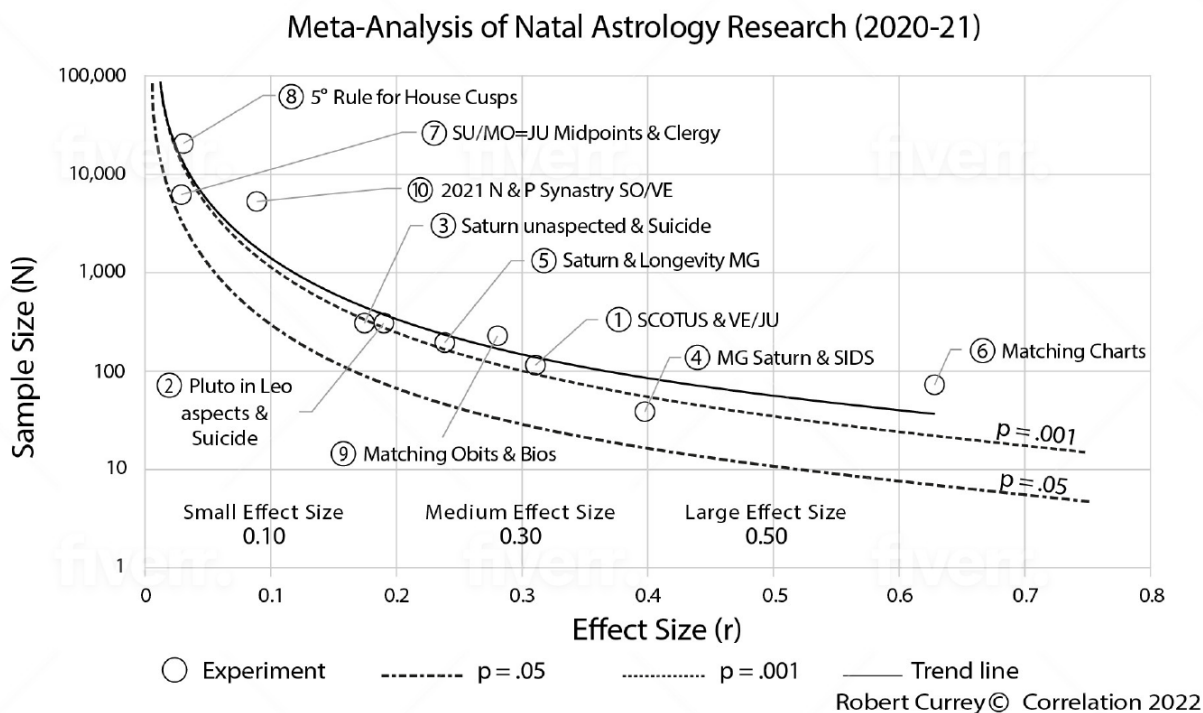


Figure 1. Meta-analysis of astrology research 2020-2021 with trendline (from Currey, 2022).

TABLE 1. Details of the Figure 1 Meta-Analysis (Currey, 2022). For the 10 studies, mean $r = .24$, median $r = .21$

Author (Year)	Hypothesis	Factors	N	p	ES: r
④ Douglas (2021a)	Saturn in MG Sectors & SIDS	single	38	0.007	0.40
⑤ Douglas (2021b)	Saturn & Longevity MG	single	197	4×10^{-4}	0.24
⑦ Tarvainen (2021a)	SU/MO = JU Midpoints & Clergy	single	6,285	0.01	0.03
⑧ Tarvainen (2021b)	5° Rule for Koch & Equal Houses	single	20,394	4×10^{-7}	0.03
⑩ Westran (2021)	N & P Synastry SU/VE	single	5,200	4.76×10^{-11}	0.09
① Currey (2021b)	SCOTUS & VE/JU theme	multi	115	4×10^{-4}	0.31
② Currey (2021c)	Pluto in Leo aspects & Suicide	multi	311	4×10^{-4}	0.19
③ Currey (2021c)	Saturn unaspected & Suicide	multi	311	0.001	0.18
⑥ Godbout (2020)	Automated Matching Charts	whole	73	3.9×10^{-8}	0.63
⑨ Tarvainen (2021c)	Matching Obituaries & Bios	whole	233	1×10^{-5}	0.28

JU = Jupiter; MG = Michel Gauquelin data; MO = Moon; N = Natal; P = Progressed; SIDS = sudden infant death syndrome; SU = Sun; VE = Venus.

As a practical aid for research design, Currey’s meta-analysis helps estimate the minimum sample sizes needed for tests to have a reasonable chance of significance. This is useful because data privacy laws have made accurately timed birth data very difficult to obtain. For well-designed tests, Currey’s (2022, p. 55) recommended minimum sample sizes—based on Cohen’s (1988) guidelines—are: for single-factor tests, 350 subjects (600 to 1000 for Sun-sign experiments); for multifactor tests, 70 subjects; and for whole-chart tests, 25 subjects. To ensure safety, most studies will need enough subjects for two separate tests: an experimental test and a verification test. This would double the size of Currey’s recommendations, as the data would be randomly distributed between the two tests.

Seeing that the use of combined cookbook factors appears to boost effect-size, one must wonder whether, given a sufficient number of properly interpreted factors in whole-chart experiments, effect-size could not extend all the way to 1 (perfect correlation) with every chart tested making a correct first-choice match. There is room for improvement in several areas. Godbout (2020, p. 24) identifies three types of losses that are sources of experimental “entropy”: the loss of accuracy when recording birthtimes; deficiencies and inconsistencies in the described personality traits present in the biographies or personality test scores; and deficiencies in astrological semantics.

With regard to reducing informational losses and

building more complete semantic models, Godbout’s already impressive best effect-size of 0.63 does not include the positions of planets in the diurnal houses that are the entire basis of the Gauquelin findings. This is because Godbout (p. 14) could not establish a consensus among authors on keywords for houses. The lack of consensus suggests that eminence effects (or skills and aptitudes in general) and the departments of life to which they apply (as houses are described in the older texts) have been mistakenly “updated” by modern humanistic authors, such as Dane Rudhyar (1936), who have tried to psychologize everything in a chart. Research can possibly correct this. Additionally, there is the enormous task of testing and evaluating the plethora of “advanced” and esoteric techniques that astrologers have dreamt up over the centuries, as we find in most astrology software programs as options. The question is what, if anything, these techniques contribute to the accuracy of astrological interpretations.

DISCUSSION

In my opinion, the greater goal of astrological research, beyond demonstrating its validity, is to improve its applications and to explain theory. Astrological textbooks cover theory *descriptions* but provide few details on *process*. To use the cooking metaphor, the cookbooks are heavy on ingredients (properties), but do not say enough about proportional recipes (combinations) or the relational steps and settings for how the cooking (evaluation) is ac-

tually done.

In a more transdisciplinary approach, it may seem odd but astrology is not the only discipline to use the recipe metaphor to describe the analysis of complex systems and emergent effects. For example, computer scientist Judea Pearl (Pearl & Mackenzie, 2018, p. 12) maps out what he calls an *inference engine* that tests presumed knowledge with “recipes” to evaluate emergent effects.

In my interpretation of Pearl’s inference engine, existing knowledge assumptions (theories) that have been *modelled* by scientists (with relevant single-factor or multifactor constituents) are subjected to a query of interest. Different *recipes* or *estimands* for answering the query are then applied to critically transform the model (as experimental interventions or treatments). The model is then tested with input *data* to obtain a statistical estimation of emergent effects. The resultant evaluations are then used to improve the starting assumptions and further modeling. In a more simplified description of eliciting inferences, Pearl (pp. 130–131) describes piecemeal interventions as “wiggling” one piece (either a supposed source A, or a supposed mediator B) while holding the other pieces steady and observing the emergent effects on C.

Although Pearl is concerned mainly with tracing causal effects and mediators, the same reasoning would seem to apply to firming up correlational effects in astrology. Presumably, there are no causal astrological effects in the accepted physical sense but there are inferred correlational effects. As explained by the early modern leader of scientific empiricism, Francis Bacon (1857, p. 351), “The last rule (which has always been held by the wiser astrologers) is that there is no fatal necessity in the stars; but that they rather incline than compel.” Note carefully that Bacon’s rule suggests that astrological inclinations are actually beyond empirical observation. They are inferred tendencies that the native might or might not follow. The native may buck the influences that other natives—other worlds or other parallel universes, so to speak—may have on their own world.

Regardless of what the native does, astrology must assume emergent patterns of prevailing trends that are responsible for its statistical inferences and its truth values. The researched truths depend on the statistical models not only to correlate *astrological properties* but also to correlate the so-called *astrological influences*, as neither of these effects can be empirically perceived but are rather inferred from the models and the evidence.⁹ As astrology presumes to already know a great deal about its own trend-inducing configurations, as documented in the cookbooks, the research effort is partly a question of how to isolate and corroborate the complex, interrelated taxonomies from the statistical data as evidence.

Astrology research must deal with problems of overdetermination and underdetermination because its keyword constituents are difficult to disentangle from the keyword aggregations where the correlational results are observed to emerge. The same burden of isolating constituent properties also appears in other disciplines of inference. If one were to think more analytically about the problem of constituents, each descriptive keyword of the applied theory is what astrologers call a *potential*, which means a potential instance or potential fact, or more precisely, a *counterfactual property* that, in some combination with other counterfactual properties, might or might not manifest—but tends to manifest—certain *emergent properties* as resulting instances. This analysis is consistent with Oxford theoretical physicist Chiara Marletto’s (2021) definition of counterfactuals as “meta-statements about what can or cannot be made to happen” within the limitations of natural laws.

In a natural, biological context, combinations of counterfactual properties are what Marletto (p. 13) calls “abstract catalysts.” These catalysts, she explains, are naturally selected “recipes” that codify copyable facts about the environment as constituents of a generative process that gives lifeforms an entropy-resistant “resilience” capable of “keeping themselves in existence” well beyond the rapidly degrading impermanence of non-living things. The recipes represent a sort of informational “knowledge” in the sense that it is reproducible and transferrable. In my interpretation, this knowledge of counterfactual would-have-been adaptations results in emergent characteristics that can operate well below the threshold of consciousness, as Marletto says this knowledge “does not have to be known to anyone.”

In a laboratory research context, Pearl and Mackenzie (2018, pp. 9–10) describe the language of counterfactuals as the “building blocks of scientific thought” that reaches beyond empiricism by inference. They say that “whereas regularities can be observed, counterfactuals can only be imagined,” and yet they are “not products of whimsy but reflect the very structure of our world model.” We make “very reliable and reproducible judgments all the time about what might be or what might have been.” Pearl and Mackenzie even extend the building blocks concept to say that the “algorithmization of counterfactuals invites thinking machines to . . . participate in this (until now) uniquely human way of thinking about the world.” Like human minds, a machine can represent possible counterfactual worlds and “compute the closest one” (p. 268). This almost sounds like a description of Godbout’s chart-matching machine that selects the nearest biography (closest world) among given natal charts according to a symbolic regression algorithm (machine scientist) that is modelled by the semantic tax-

onomies and rules of astrological knowledge.

These transdisciplinary considerations of emergent effects suggest that the process of creating and applying replicable, resilient counterfactual knowledge, as selectively modelled in codes or recipes, is available not only within the internal processes of organisms but also within human minds and thinking machines. As a comparable counterfactual process, it is hard to deny the resilience of astrological knowledge as it has been semantically codified, thought about, copied, and taxonomically refined with high fidelity since the beginnings of recorded history.

CONCLUSIONS

Effect-size is the new wrinkle in astrological research. There is no question that well-informed critics have played a crucial role in bringing attention to this important metric and, along with their other statistical contributions it is serving to sharpen the skills and shape the program of the small community of responsible researchers. With the help of effect-size metrics and meta-analysis, the contours of effective information in astrology are beginning to emerge. In this present article, I have considered the research program to be loosely organized in terms of single-factor, multifactor, and whole-chart methods that each provide different powers of study.

At first, whole-chart methods had seemed like a game played against astrologers by their critics—until it became automated by a machine capable of semantically analyzing nearly all the important factors in many natal charts at once, a feat that is well beyond human limitations. As the implications are far-reaching for in-depth research into the nature of astrological factors as semantically interpreted potentials, Godbout's findings especially need independent replication.

The Solar System planets are the astrological symbols and emissaries of connections between each native's world of the people and events that truly influence their lives. The research suggests how to infer semantic properties by the emergence of distinctive patterns of character, behavior, and experience. The astrological design of experimental models and their corroboration with cookbook interpretations—which are in effect a corpus of its theory—cannot be a scientific mystery as it uses the same methods of inferring evidence of truth values.

IMPLICATIONS AND APPLICATIONS

The implication of astrological research, with its body of counterfactual knowledge, has always been that it reaches beyond the empirical limits of sense perception and yet the knowledge is intrinsic and discoverable by in-

ferences from data. Thus, it is unrelated to psychic perceptions, given that ESP can be defined as not the result of any means we know of (Phillipson, 2000, p. 139–140). This makes me wonder what could be learned by comparing astrological thinking with psychic thinking, as we would expect a difference.

Following Godbout's machine findings, it seems likely that astrological cookbooks are poised for a more complete knowledge transfer to automated systems that, assisted by machine scientists, can enable more accurate astrological descriptions of potential and emergent worlds than is humanly possible. For comparison, it might be interesting to match psychic abilities with such machines, for example, in blind tests to identify issues of character and events.

NOTES

¹ As language evolves by technology, borrowing, metaphor, and other influences, a succession of cookbooks have been semantically updated from earlier versions. This can be appreciated in early taxonomic models of character such as: hot; cold; wet; and dry, that we see extensively used by Hellenistic astrologers (Ptolemy, Valens, Maternus, and others). These descriptions have long been abandoned, in favor of more psychologically nuanced sentiments.

² The Hermetic maxim from antiquity, "As above, so below," presumes a sort of conservation principle between macrocosms and microcosms aligned relative to a fixed center, which in natal astrology is the microcosmic environment of each native's birth and life. The macrocosmic environment used in astrology is the Solar System centered on the native, which, by the same principle of cosmic symmetry, is itself a microcosm of increasingly larger macrocosms that ultimately entail the whole universe with the native at its center. The Solar System is the nearest shared cosmic environment or *correlative world* that is easily predictable, yet it is the macrocosmic environment of the whole universe that suggests astrology's universal explanatory power (McRitchie, 2004, 2006).

³ I defer to the custom of describing effects as "astrological influences," which are theoretical and not to be confused with physical influences. The influences act between astrological natives and the parallel, correlative worlds of their experience.

⁴ Ertel (1987) found that other professions associated with planetary eminence effects do not exhibit the same high degree of linear trend by rank as Mars athletes do. Mars appears to be a special case with a disproportionate effect as a single factor for athletes. The more easily measured orbital behavior of Mars and its pronounced

astrological urge of assertion have made it the leading observational subject for Johannes Kepler and Michel Gauquelin, respectively.

- ⁵ Where the ES of results are not mentioned in the sources I cite, I use, as recommended by Currey (2022), the simple model of: Significance Test = Effect Size x Study Size, according to Rosenthal and DiMatteo (2001, p. 63), from which Pearson's r can be evaluated (p. 72) by the formula $r = Z/\sqrt{N}$ where p has been converted to its associated one-tailed standard normal deviate Z .
- ⁶ A day-for-a-year progression is where the natal chart is compared to what it would have looked like one day later for each year of life. For example, if the native is 27 years old, then the progressed planetary positions are those at 27 days after birth. As the Moon completes an orbit around the Earth in 27.2 days, the Moon will have returned to approximately the same position it occupied at birth. The native's other planets progress more slowly.
- ⁷ Westran tested his 1300 couples for aspects in 4 dimensions of time (natal to natal, natal to progressed, progressed to natal, and progressed to progressed). Therefore, $N(4 \times 1300) = 5200$. Although Westran's results are only for the Sun/Venus aspect, which is single-factor as there can be only one aspect at a time, in this case the concept of what single-factor means is somewhat ambiguous because of the additional time dimensions.
- ⁸ In part because they live in different parts of the world and have little in-person contact.
- ⁹ I would submit that the presumption of both inferred properties and inferred influences is what largely contributes to the uncomfortable relationship between astrology and physical science. Inferred influences are the harder concept to accept than inferred properties, which are common in science, although an influence and its mechanism may, in fact, be a property.

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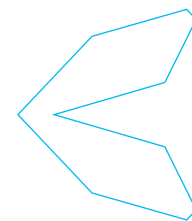
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ESSAY

Reconsidering Context in Psychedelic Research: Ritual Emergent Mechanisms and the Unified Field

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HIGHLIGHTS

Aspects of ritual settings in early human societies still likely play an important role in the efficacy of psychedelics used in modern therapy.

ABSTRACT

The outcomes of recent psychedelic research have been attracting more public attention in the media along with an increase in private funding. This research has primarily been conducted in a clinical setting while attention to context has largely been ignored. Entheogens have been used by early man in ritual settings as far back as recorded history can be found. Modern clinical use has only been occurring within the last century. This leaves much to explore in terms of the context in which such potent treatments have effect. This manuscript provides a conceptual framework for entheogenic rituals, the effects, and how they could be scientifically studied. It examines the therapeutic use of psychedelics from both the biomedical perspective of the diagnosis and treatment model, and as contrasted with the ritual context. It discusses explicit and implicit ritual attributes that may play a role in the healing process. Additionally, the manuscript identifies cultural healing assumptions embedded in psychedelic study, in favor of mechanistic causation that could be affecting a dismissal of the value of the ritual context. The paper examines the ritual context including component parts, introduces the concept of emergent mechanisms for describing non-physical experiences including analyzing contrasting paradigms of healing, proposes considerations for alternative research design philosophy, and introduces a framework for how entheogenic rituals research may be conceptualized and implemented.

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KEYWORDS

Psychopharmacology, psychedelics, entheogens, rituals, healing paradigms, cultural psychology, cultural medicine, emergent mechanisms, unified field theory

INTRODUCTION

Throughout history and into modern day practices, evidence exists demonstrating that global indigenous communities, ancient Greeks, paleo-Christians, Renaissance witches, Bronze and Stone age ancestors, and postmodern syncretic religions have relied on psychoactive pharmacology for healing and spiritual growth (Gordon Wasson et al., 2008; Muraresku, 2020; Piper, 2013; Ruck et al., 1979; Rush, 2013; Valamoti, 2013). However, the historical use of drugs, entheogens specifically, and their intentional

purposes particularly in Western civilization is under-researched (Hillman, 2008; Muraresku, 2020). With the rise of new technology for archeobotanical and archeochemical investigation, tools are becoming available for objective analysis of the use of drugs in antiquity (Muraresku, 2020). These tools will provide objective chemical and botanical data. This data coupled with the context in which they are found will allow scientists to be able to determine specifics about their form and function.

Entheogen is the particular academic term given



to psychoactive drugs formulated from plants (Tupper, 2009a). The term entheogen, derived from the Greek root word *entheos* meaning the God within, connotes connecting with the experience of the Divine that resides in all beings (Muraresku, 2020; Ruck et al., 1979; Winkelman, 2007). In the spiritual healing context, the plants are powerful, sacred medicine that provide access to the spirit realms for health, well-being, and guidance (Homer, 2009; Muraresku, 2020; Winkelman, 2007). Entheogens provide for the occurrence of a profound altered state of consciousness for those who ingest them. Retrieved from a variety of native plant sources throughout history, entheogens have been used as a source for knowledge acquisition, divine contact, and healing (Gordon Wasson et al., 2008; Merlin, 2003; Muraresku, 2020). A number of researchers believe that the historical reliance on entheogens may have played a significant role in the evolution of consciousness throughout history (Gordon Wasson et al., 2008; McKenna, 1999; Muraresku, 2020; Piper, 2013; Ruck et al., 1979; Schultes, 1998). Postmodern scientific exploration has produced synthetic forms of psychoactive drugs, referred to more commonly as psychedelics, prompting investigation of the therapeutic potential of the use of psychedelics and entheogens.

This manuscript will use the term entheogen to refer to any form of psychoactive substances occurring naturally in plants used in a spiritual healing context. The general term for hallucinogenic psychoactive drugs in the Western clinical setting is psychedelics, which will be used in this paper to refer to synthetically created treatments administered in a Western clinical setting. This manuscript will examine the historical entheogenic use, more specifically in a ritual context. It will describe the state of the field for modern psychedelic research conducted in both clinical settings and in modern spiritual ceremonies, for elucidating their purpose. It will review attributes from ceremonial contexts along with a proposal for emergent mechanisms that are ripe for investigation of their contributions to ritual effects and impact. It proposes a hypothesis for rituals to be perceived as a gateway to a unified field of information along with potential mechanisms for accessing it and the emergent mechanisms contained within it. Finally, it concludes with a suggestion for an alternative way to conceptualize entheogenic healing rituals and considerations for advancing entheogenic/psychedelic research.

PSYCHEDELIC CLINICAL RESEARCH

Psychiatry began to understand the biological correlations of mental illness, prompting the application of pharmacological treatments for it in the 1950s (Winkelman, 2007). It was during this period that psychedelics

were discovered for their curative abilities in the Western world's academic disciplines of psychology and medicine. During the mid-twentieth century, psychedelic research flourished primarily in clinical settings and in a more limited fashion through ethnographic studies conducted in spiritual settings. This research evidenced the powerful emotional, cognitive, and therapeutic reactions associated with psychedelic and entheogenic ingestion. The close of the 1960s brought a shift in ideology that would essentially eradicate the scope of this activity. In 1970, governmental restrictions on the research and therapeutic use of psychedelics made it illegal to possess any of these substances (Muraresku, 2020; Winkelman, 2007).

In a circumspective overview of this 20th century psychedelic research, Carhart-Harris and Goodwin (2017) concluded that reported outcomes from this early psychedelic research were consistent with potential efficacy; however, most of the studies were not appropriately designed to demonstrate efficacy conclusively. The subjective, observational, and population-based data indicate a positive association between psychedelic drug use and mental health with some caveats. A 2016 meta-analysis of 19 studies by Rucker et al. (2016) on psychedelic treatment for mood disorders, published between 1949 and 1973, found that 79% of patients showed "clinically-judged" improvement post-treatment. A meta-analysis by Krebs and Johansen (2012) of studies on LSD treatment for alcoholism in the 1950s and 1960s reported similar findings of statistically significant treatment efficacy with short-term benefits. The primary issues identified in these analyses were an absence of standardized diagnostic techniques, measures of symptom severity, and lack of randomization and control conditions in these studies.

The 21st century brought a renewed focus in academia on entheogens and psychedelics as a therapeutic intervention (Young, 2022). Researchers at The Center for Psychedelic and Consciousness Research at Johns Hopkins University were the first to obtain regulatory approval from the United States government to re-establish research in the therapeutic use of psychedelics (Lewis, 2020). Since this time, this institute has been active in running clinical trials for treatment of addiction, existential distress caused by life-threatening illness, and treatment-resistant depression, and has published more than 115 peer-reviewed articles about treatment in a clinical context (Center for Psychedelic & Consciousness Research, n.d.). In the last several years, New York University, Harbor Medical Center at the University of California Los Angeles, University of California San Francisco, The Imperial College of London, and Yale University all have begun clinical trials on psychedelic-assisted therapies (Muraresku, 2020). Studies have primarily focused on psychedelic treatment of addiction,

TABLE 1. Recently Published Systematic Reviews and Meta-Analysis for Clinical Psychedelic Research

Authors, Publication Year	Treatment Condition	# of Studies Reviewed	Results
Maia et al., 2022	Serious illness	20	Positive effects of treatment especially regarding psychological symptoms
Zeifman et al., 2022	Suicidality	7	Decreased suicidality
Schimmel et al., 2022	Anxiety, depression, and existential distress in terminally ill patients	33	Positive effects of treatment on existential and spiritual well-being, quality of life, acceptance, and reduction of anxiety and depression with few adverse and no serious adverse side effects
Smith et al., 2021	Post-traumatic stress disorder (PTSD)	6 unique, 2 long-term follow-ups	Treatment produced clinically significant reduction in PTSD measure; reductions were sufficient to no longer meet the clinical definition of PTSD
Leger & Unterwald, 2022	Anxiety and depressive disorders	9	Effective treatment producing rapid and sustained improvements

anxiety, depression, palliative care, post-traumatic stress disorder, and other psychological disorders (Center for Psychedelic & Consciousness Research, n.d.; Schneider et al., 2021).

The clinical trials designed over the past two decades have addressed 20th century research concerns with more careful experimental designs and more critical approaches to outcomes (Carhart-Harris & Goodwin, 2017). Table 1 represents the recent systematic reviews and meta-analysis validating the effectiveness of psychedelic-assisted therapies for mental health issues over the last two years.

Now that research has supported the efficacy of psychedelics and entheogens for healing mental illness, further investigations have turned attention to understanding the extent of treatable illnesses and conditions, to what degree they can be treated, and the sustainability of treatment. Several publications make the call for future psychedelic research to focus specifically on the environmental variables and conditions of the treatment (Agin-Liebes et al., 2021; Carhart-Harris et al., 2018; Loizaga-Velder & Verres, 2014; Talin & Sanabria, 2017; Trichter et al., 2009; Tupper & Labate, 2014).

Some research attention has been given to the environmental context, but mostly within the bounds of a psychedelic-assisted therapeutic model consisting of a traditional psychotherapeutic clinical setting. In 2018, Carhart-Harris et al. published a perspective article stressing the importance of context in psychedelic research. Clinical trials are conducted in a classical clinical setting that includes what Carhart-Harris et al. assess as “special attention to context” (2018, p. 2). By this, they mean all subjects undergo extensive psychological preparation before and

after the experiment. According to Carhart-Harris et al., the session environment is prepared to enhance the quality of the experience and their long-term outcomes for the participants.

Conventional mental healthcare centralizes the client-therapist relationship with the therapist serving as an active guide in the healing process (Gorman et al., 2021). Psychedelic-assisted treatments administered in standard psychotherapeutic environments generally have low lighting, specially selected music playlists, and aesthetically pleasing décor that invokes comfort and beauty (Carhart-Harris et al., 2018) with two compassionate mental health professionals who support pre-treatment preparation, treatment administration, and integration post-treatment (Johnson et al., 2008). There is also attention given to building a trusting relationship between the mental health professionals and the subjects (Carhart-Harris et al., 2018).

Research has indicated that the pharmacological mechanisms of psychedelics create “exceptional” environmental sensitivity (Carhart-Harris et al., 2018, p. 1). Therefore, any psychological harm recorded from the treatment sessions may be due to the neglect of the necessary context for success. The researchers contend that their review of the literature has left them with little to assess with respect to the treatment context. The only variables that have been studied are the influence of music (Kaelen et al., 2015), creative imagery, and autobiographical memory scripts (Carhart-Harris et al., 2018). Agin-Liebes et al. (2021), conducted a qualitative study on the integration of psychedelic assisted therapy into a group format using an interpretive phenomenological analysis. Their findings indicated that the group therapy context “may enhance the

effectiveness of trauma processing by reinforcing social cohesion, safety, trust, and belonging” (2021, p. 2).

The current psychedelic context variables that are being studied are limited to the medical model’s clinical setting. Entheogenic rituals are a context that has a much longer global history than the current clinical treatment model. It should not be disregarded as a viable context for mental health healing as well as its other effects. The following sections will cover an exploration of entheogenic ritual context and healing including an overview of the historical use of psychoactive substances in a ritual context and the global evidence of its presence dating back to early humans, an investigation of ritual components and emerging mechanisms, an overview of the current state of the research on entheogenic rituals, and an evaluation of the paradigms of healing from both the clinical context and the ritual context.

PSYCHOACTIVE PLANT USE WITHIN A GLOBAL RITUAL CONTEXT: A HISTORICAL OVERVIEW

Entheogens such as ayahuasca and psilocybin (also known as magic mushrooms), which contain psychoactive substrates, are used to induce profound altered states of consciousness and to promote the expansion of consciousness (Carod-Artal, 2015; Tupper, 2009a, 2009b; Watts, 2013). This author is making a distinction between entheogens as naturally occurring plant-based medicines as opposed to synthetically made psychedelics; although they both have historically been described as hallucinogens or psychedelics in the literature. In both ancient history and in postmodern cases, entheogenic ingestion has been a part of healing and spiritual ceremonies conducted by indigenous communities and more recently by syncretic religions (Burkert, 1985, 1987; Csordas & Lewton, 1998; Eliade, 2020; Lee et al., 2016). Modern use is concentrated in the Amazon where the vine that bears an entheogenic brew called ayahuasca can be found (Blainey, 2015; Fotiou, 2012; Grob et al., 1996; Tupper, 2009a, 2009b). Cultural associations of magic, witchcraft, sorcery, deity and spirit invocation, and mediumship can be a part of these rituals. Participants hold an integrated view of health and spirituality; thus, there is a spiritual explanation for the therapeutic benefits derived from participation in these rituals (F. S. Barrett & Griffiths, 2018; J. C. Barrett et al., 1991; Muraresku, 2020). From this perspective, a mystical experience is a therapeutic one (Carhart-Harris et al., 2018; Griffiths et al., 2006; Richards, 2015). Winkelman’s research (1996, 2001, 2007) also supports the theory that the spiritual encounter is a therapeutic event which causes a profound shift in self-awareness toward a spiritual or sacred domain.

Entheogenic rituals are conducted for many purposes: for diagnosis and healing, for communion with the spirit worlds, for gathering information for practical use, for giving access to spiritual beings to the worldly plane to conduct healing, for its predictive power, for increased self-awareness, to honor nonphysical beings, and to increase one’s connection to nature and the nonphysical reality (Carod-Artal, 2015; Csordas & Lewton, 1998; Eliade, 2020; McGovern, 2009). There is a growing body of evidence of psychoactive drug rituals throughout history (Burkert, 1985, 1987; de Smet, 1985; El-Seedi et al., 2005; Fitzpatrick, 2018; Miller et al., 2019; Samorini, 2019; Stewart, 1987; Wadley, 2016). Table 2 highlights the transcontinental historical evidence from archeological excavation, historical documents, archeochemical and archeobotanical data, anthropologic artistic symbology, excavated objects, and environmental clues. It documents components of the ritual context and some emergent mechanisms at each location when it was reported in the literature, which is further discussed in the following sections.

IDENTIFYING RITUAL COMPONENTS

Ritual components are important variables that need consideration. Table 2 indicates ritual components as identified by the study of historical and recent entheogenic ritual practice. Singing, chanting, music, and dancing in unison are activities common to rituals throughout the world and throughout history (Schwartz 2021). Sacred objects such as chalices, baskets, and altars (Csordas & Lewton, 1998; Morrison, 2003; Muraresku, 2020) in a dedicated sanctuary is also a common attribute (de Polignac 1995). In religious ceremonies, ancient and modern, there is almost always a routine gathering place where rituals and services are performed (Collins, 1990, 2014; Schwartz, 2018). Sacrifices and offerings are other attributes of the ceremonial spiritual context (Csordas & Lewton, 1998; Kerényi & Kerényi, 1991; Muraresku, 2020).

Healing songs (Fotiou 2012), prayers, and intention are considered to be powerful tools to aid in healing. Songs, sometimes referred to as hymns, help to create and maintain sacred space that provides the convergence of the physical and spiritual dimensions. Intention and prayer, usually vocalized in harmony at the beginning of a ritual, have significant value to the ritual practice (Csordas & Lewton, 1998; Schwartz, 2018, 2021). According to Carhart-Harris et al.’s (2018) study on therapeutic factors of psychedelic-assisted therapies, intention was revealed as an important factor of the therapeutic experience in a clinical setting as well.

One of the most common attributes found in ritual studies is a sacrament usually in the form of an ingestible

liquid (Buhner, 1998; Csordas & Lewton, 1998; Gordon Wasson et al., 2008; Muraresku, 2020). These concoctions, sometimes mixed into an alcohol-based medium such as wine or beer, are understood as a power, sacred medicine, a medium for divine contact and healing. In fact, the evidence has had some scholars referring to some ancient communal spiritual activities as prehistoric drug rituals (Burkert, 1985; Kerényi & Kerényi, 1991; Muraresku, 2020). Modern and historical practitioners take the position that the sacrament is imbued with a Divine being or even God him/herself (Goldman, 2010, 2014; Mayerson, 2001; Müller, 1847; Muraresku, 2020; Ruck et al., 1979). The Christian wine sacrament used pervasively throughout the world is considered to be the blood of Jesus Christ, the reported son of God (Muraresku, 2020).

According to Valamoti (2013), the ancient Greeks' detailed accounts of psychoactive sacramental wines for creating an altered state of consciousness to communicate with spirits, deceased ancestors, and God in a ritual setting are numerous. The ancient Greeks also left evidence of the careful preparation that initiates undertook to participate in the rituals of the Greek Mysteries (Muraresku, 2020). The initiation into the spiritual community took place in stages allowing for psychological preparation before the succession of rites. There was a community of elders, who were advanced in practice, who served as mentors to provide support for the novice throughout the induction process. This is synonymous with the Gnostic perception of Jesus serving as a guide on the path to self-discovery. Pagels compares this to the psychotherapeutic approach whereby guidance is given as a provision measure with "the purpose of accepting authority to learn to outgrow it" (Pagels, 1989, p. 126). The ancient Greek practitioners also gave support and preparation for reintegration back into everyday life (Muraresku, 2020). Both the preparation for entry to the ritual and back into the world are shared components found in the clinical psychedelic treatment approach.

IDENTIFYING EMERGENT MECHANISMS OF RITUALS

The ritual process is a complex intervention involving complex dynamics particularly in a healing context. Sturgiss and Clark (2020) suggest that when there is complexity in interventions and processes, there could be a synergistic nature of component variables that equate to more than just the sum of these parts. Clark (2013) defines emergent mechanisms as arising from the synergies of variables which may help to explain outcomes and may contribute to unpredictability often observed in clinical trial outcomes. The theory of emergent mechanisms can be applied to the study of ritual practice outcomes and experiences. In this

case, emergent mechanisms might be best understood as non-physical phenomena such as mental experiences—thoughts, intentions, ideas, insights, mystical experiences, and other phenomena reported by ritual practitioners. Emergent mechanisms will be the broad term used to define the non-physical experiences and activity reported by practitioners in the entheogenic ritual context in this manuscript.

Altered states of consciousness, transcendence, and mystical experiences are some of the most identified emergent mechanisms of rituals and entheogen use (Burkert, 1985; Carod-Artal, 2015; Csordas & Lewton, 1998; Eliade, 2020; Lee et al., 2016; Watts, 2013) (see Table 2). In an altered state, there is a felt sense of transcending space and time reported as a common effect of psychedelic therapy (Richards, 2015). A sense of unity and sacredness of all material life is another commonly reported phenomenon. In the Greek mysteries, initiates of the Dionysian sacrament reported the merging of souls with the other participants, the Divine, and with the life of earth (Euripides & Dodds, 1987). The Greek rituals offered healing, transcendence of the division of humanity and nature, and communion with God (Gordon Wasson et al., 2008).

Another emergent mechanism is a sense of dying before you die, a transformation from mortal to immortal. Records exist documenting this experience by the ancient Greeks and the gnostic Christians (Jebb et al., 1917; Muraresku, 2020; Pagels, 2004; Race, 1997; Richards, 2015). This death may mark the opening to discrete realms of reality, an opening to a gateway of knowledge commonly referred to in the textual accounts of mystical experiences (see Table 2). This knowledge is hidden from the mind in the normal waking state of consciousness. It will be henceforth referred to as non-ordinary knowledge. The discrete realms may also contain the other emergent mechanisms evidenced in entheogenic ritual settings from Table 2—access to the spiritual realms, to Divine beings, to powerful revelations, to guidance and teachings, and to visionary phenomenon (Goldman, 2010, 2014). According to Muraresku (2020), the purpose of the Greek Mysteries was to bring clarity to the presence of their divinity. The entheogenic sacrament gave them access to the knowledge of the spiritual realms (Müller, 1847; Pagels, 2004; Richards, 2015). It gave participants direct contact with the forces that exist in these realms (Burkert, 1985, 1987; Muraresku, 2020; Pagels, 2004; Richards, 2015). Mediumistic experiences, particularly with disincarnate ancestors (Liu et al., 2018) and Divine beings who have healing wisdom and power to share, are also reported experiences (Alverga, 2010; Goldman, 2010; Labate & MacRae, 2016). British scholar Hoyle (Plommer, 1967) finds reports in the Greek tragedies of female worshippers becoming filled with in-

tense rapture, becoming filled with the Spirit, and acquiring powers of divinity. Descriptions of spiritual mediumship (aka possession) during rituals are numerous (Csordas & Lewton, 1998; Goldman, 2010, 2014; Gordon Wasson et al., 2008; Labate & MacRae, 2016; Muraresku, 2020; Ruck, 2016) (see Table 2).

The idea that the sacrament contains a teaching spirit, that when ingested, imparts lessons, knowledge, and wisdom to those who partake is also prevalent (De Rios, 2009; Goldman, 2010, 2014; Muraresku, 2020; Pantoja & da Silva Conceição, 2016). For example, a shaman may ingest ayahuasca to ascertain information on a variety of topics including locating enemies, preparing for hunting or other expeditions, or determining a cause and cure of a disease (Tupper, 2009b). Practitioners emerge from ritual sessions with clear knowledge of lessons, teachings, and powerful revelations relevant to one's personal development and evolution (Goldman, 2010; Gordon Wasson et al., 2008; Labate & MacRae, 2016; Muraresku, 2020). The Greek Mysteries of Eleusis reference the elements of the rituals as things said "legomena", things done "dromena", and things shown "deiknumena" (Muraresku, 2020, p. 42). Visions inspired by entheogens are often the vehicle for accessing the spiritual realm and the knowledge that resides there (Alverga, 2010; Goldman, 2010; Kerényi & Kerényi, 1991; Labate & MacRae, 2016; Muraresku, 2020; Richards, 2015; Wasson, 1957). The ritual practices open those who partake of these forces, providing access to a gateway of knowledge not normally accessible to humans (Goldman, 2010, 2014; Richards, 2015; Tupper & Labate, 2014). The mystical experience has a noetic quality where insights reveal non-ordinary knowledge undiscovered by the discursive intellect providing significant and important illuminations of the depths of truth (James, 2002). All of these emergent mechanisms provide healing on some level of the person's being.

The science of physics can perhaps explain the basis of emergent mechanisms, therefore making it available to empirical study. Thompson (2021) proposes a model of how the non-physical affects the physical. In his model, he acknowledges discrete planes of existence from spiritual purposes to mental, to intentions, to sensorimotor minds, to spiritual bodies, to final causes, and to physical objects. His model mathematically describes three discrete degrees in causal order as Quantum Field Theory, Quantum Mechanics, and Classical Newtonian Physics. His work designed a mathematical mechanistic case for how the nonphysical effects influence, via these three discrete degrees, which then influence protein folding within the cell. Therefore, it is the hypothesis of this work that the ritual context, aided by the ingestion of the entheogen, provides practitioners access to the discrete nonphysical planes

proposed in Thompson's physics model where the emergent mechanisms arise. If this hypothesis is to be tested, we need a new research philosophy and framework that will support the investigation and the applied outcome measures of assessment. This hypothesis will be explored more in depth under the proposed research framework section.

RESEARCH ON MODERN ENTHEOGENIC RITUALS: THE STATE OF THE FIELD

Few studies evaluating the ritual context exist. For those that do exist, there is little consistency in study methodology. Even fewer studies focusing specifically on ritual components and emergent mechanisms could be found by this author, but opportunities for this research to be conducted are present. In the mid-twentieth century, syncretic Spiritist religions that rely on ayahuasca as a sacrament began to emerge (Tupper, 2009a, 2009b). Spiritist religions developed from a fusion of various aspects of religious and spiritual traditions, esoteric mysticism, and indigenous practices. Spiritists' core tenets are immortality of the soul, communication with spirits, and reincarnation (Fernandes, 2008; Kardec, 1858). For example, in the Barquinha religion, entheogenic healing rituals focus on spirit possession and exorcism, whereby church members take on a mediumship role to cast out the malevolent spirits believed to be the cause of patients' illnesses (Araújo, 2006; Frenopoulo, 2008).

The Hoasca Project was a first attempt to study entheogens from a biomedical perspective in its spiritual context in the Brazilian Amazon (Grob et al., 1996). This study collected psychological assessment data from 15 church members of Centro Espirita Beneficente Uniao Do Vegetal (UDV) who had been drinking ayahuasca for more than ten years, and compared the results to a matched control group. Most of the UDV church members had a variety of long-term dysfunctional or risky behaviors accompanied with addiction issues prior to their ceremonial participation. All 15 participants remarked on how their UDV experiences impacted their life paths. Statistically significant results were achieved in the personality integrating concepts (Jung's theory for the process of bringing together the individual and collective unconscious into the personality; it involves coherence and congruence (Jung, 1939), testing variables of novelty seeking ($p = 0.0054$); harm avoidance ($p = 0.011$), as well as cognitive dysfunction measure of word recall ($p = 0.038$) for the treatment group. Interviews from this study found that first-time participants in a ritual uniformly marked a critical experience which represented a profound shift in subjects' daily lives. After joining the church to become regular ceremonial participants, they

TABLE 2. Evidence of Psychoactive Drug Use in a Healing and/or Ritual Setting

Location, Society	Time Period	Evidence	Citations
Neanderthals	9700 BCE	<i>Rituals:</i> Dental calculus from skulls evidences the use of medicinal, if not spiritually motivated, psychoactive plants in early man.	Fitzpatrick, 2018
Americas			
Mesoamerica, Numerous Indigenous Tribes	5000 BCE to current day	<i>Rituals:</i> Entheogenic healing rituals. <i>Ritual Components:</i> Music, chanting singing, various forms of psychoactive substances. <i>Emergent Mechanism:</i> Altered state of consciousness.	Carod-Artal, 2015; Carod-Artal & Vázquez-Cabrera, 2006; de Smet, 1985; Thomason, 2010; Torres et al., 1991
Lopez Altiplano, Bolivia, Indigenous peoples	1000 CE	<i>Rituals:</i> Shamanic paraphernalia in a ritual bundle contains entheogenic compounds.	Miller et al., 2019
Brazil, Amazon, Ayahuasca Religions	1900 CE to Modern day	<i>Rituals:</i> System of rituals using an entheogenic sacrament (also known as Santo Daime) from amazon plants. <i>Ritual Components:</i> Music, dancing, singing of hymns, recitation of prayers, concentration. <i>Emergent Mechanisms:</i> Healing, mediumship, sacred objects, "special understanding of the forces and entities that dwell in the brew (Pantoja & da Silva Conceição, 2016, p. 36)," acknowledgement that the brew is a teacher and a guide, access to other realms, access to knowledge, and personal prophecies. 'We take Daime to go looking for something fundamental, something that we don't have knowledge of, something inside our spirit. . . internal knowledge' . . . "access to depths never before reached. . . takes them back to the Divine" (Pantoja & da Silva Conceição, 2016, p. 36).	Alverga, 2010; Araújo, 2006; Cemin, 2010; Frenopoulo, 2008; Goldman, 2010, 2014; Labate & MacRae, 2016; Pantoja & da Silva Conceição, 2016; Tupper & Labate, 2014
Mexico, Mazatecs	Modern day	<i>Rituals:</i> Rituals using an entheogenic sacrament involving singing and visions.	Pike & Cowan, 1959
Mexico, Aztecs	1600 CE	<i>Rituals:</i> Pagan rituals involving a psychedelic sacrament. <i>Emergent Mechanisms:</i> Healing and access to non-ordinary knowledge. "They consult it like an oracle for everything they want to know, even those things which are beyond human understanding" (de Alarcón, 1984, p. 59).	de Alarcón, 1984
Canada, Iglulik, Inuit	1900s CE	<i>Rituals:</i> Initiation Rite- Ritual of Death and Resurrection. <i>Emergent Mechanisms:</i> Dying before dying, and visions.	Eliade, 2020
Asia			
East Asia, Pamirs & Turpin Basin	800-400 BCE	<i>Rituals:</i> Psychoactive drugs used in complex set of religious practices for medicinal and ritual purposes. <i>Ritual Components:</i> Sacred objects, human sacrifice, musical instruments. <i>Emergent Mechanism:</i> Ancestral contact.	H. Jiang et al., 2016; H.-E. Jiang et al., 2006; Ren et al., 2019
Central Asia, Hindu Kush, Hunsa people	As early as 300 BCE through Modern Day	<i>Rituals:</i> Shamanic use of psychoactive use of Juniper for protection in traditional rites and ceremonies. <i>Ritual Components:</i> Dancing, music, singing, sacrament. <i>Emergent Mechanisms:</i> Healing, altered state of consciousness, supernatural powers and accessing knowledge and prophecies.	Buhner, 1998; Ratsch, 2005; Sidky, 1994

Ancient Indian Texts	1500-1000 BCE	<p><i>Rituals:</i> Soma rituals described in the Rigveda.</p> <p>Soma is a sacramental drink imbued with God residing in a plant. Explicitly characterized as "madira" translated by Watkins as an intoxicant or hallucinogenic. "We have drunk soma and become immortal; we have attained the light, and the gods discovered." Rigveda 8.48.3 translated by Muraresku (2020, p. 66).</p> <p><i>Ritual Components:</i> Sacrament</p> <p><i>Emergent Mechanisms:</i> Dying before you die, access to spiritual realms.</p>	Müller-Ebeling et al., 2003; Muraresku, 2020; Wasson et al., 1971; Watkins, 1978
Middle East			
Israel, Mount Carmel, Raqefet Cave, Natufians	Stone Age	<p><i>Rituals:</i> Ritual feasts.</p> <p><i>Ritual Components:</i> Fermented brews.</p> <p><i>Emergent Mechanisms:</i> Ancestral contact and worship.</p>	Liu et al., 2018
Israel, Galilee, Tel Kabri, Canaanites	1700 BCE	<p><i>Rituals:</i> Psychoactive ingredients found in a storage room next to the ceremonial room at court</p>	Koh et al., 2014
Israel, Tel Kadesh, Phoenicians	2 nd Century BCE	<p><i>Rituals:</i> Organic residue analysis evidenced psychotropic infusions in oil.</p>	Koh et al., 2021
Northern Syria, Nabataeans	Bronze Age	<p><i>Rituals:</i> Marzeah rituals.</p> <p><i>Ritual Components:</i> Music, dance, hallucinogenic sacrament.</p> <p><i>Emergent Mechanisms:</i> Transcending time and space, altered state of consciousness, divine access, spiritual realm access, underworld/ancestors, mystical experiences, otherworldly travel, mediumship.</p>	Del Olmo Lete, 2015; McGovern, 2009
Israel, Tel Arad, Judahite Shrine, Israelites	8 th century BCE	<p><i>Rituals:</i> Archeochemical evidence of the ritual use of drugs cannabis found on the altar of a key shrine.</p> <p>Authors suggest it had a deliberate psychoactive role.</p>	Arie et al., 2020
Egypt, Ancient Egyptians	3150 BCE	<p><i>Rituals:</i> Archeochemical evidence of psychoactive ingredients in wine jars of a coronation ceremony which was "highly suggestive of a ritual involving psychoactive plants" (Patrick E. McGovern, 2009, p. 120).</p> <p><i>Ritual Components:</i> Sacrament.</p> <p><i>Emergent Mechanisms:</i> Access other realms, to cure spiritual blindness(healing) and access to non-ordinary knowledge. "The awesome knowledge of what lies beyond the threshold of death" (Naydler, 2004, p. 234).</p>	McGovern, 2009; Naydler, 2004
Europe			
Europe, Mas Castelar, Spain	5 th century BCE	<p><i>Rituals:</i> Initiation ritual sites evidenced the remains of fungus with psychoactive alkaloids in two different artifacts, in the teeth of a human jawbone, and in the chalices that contained a special brew. Komos symbols (ritualistic nocturnal procession from Greece) were found.</p> <p><i>Ritual Components:</i> Sacrifice, brewing equipment for sacrament, chalices, and an altar.</p> <p><i>Emergent Mechanisms:</i> Divine contact, mediumship, and ancestral contact.</p>	Muraresku, 2020; Pons, 2002; Pons et al., 2016; Tresserras, 2000
Germany, Celtic Tribes	5 th -4 th century BCE	<p><i>Rituals:</i> Discovery of henbane, a psychoactive ingredient and popular beer additive for increasing intoxication was found in malt samples. Consumption was not definitively proven (Stika, 2011).</p> <p>During the medieval ages and Renaissance henbane, which became synonymous with black magic and anthropomorphized as witches, and mutterkorn which causes seizures and hallucinations, were both psychoactive ingredients found within the same region medieval beer described as narcotic, aphrodisiacal, psychotropic and in some cases hallucinogenic.</p>	Bostwick, 2014; Buhner, 1998; Campbell, 2009; Müller-Ebeling et al., 2003; Stika, 2011
Spain, Andorra, Prats	1600 BCE	<p><i>Rituals:</i> Ritual grounds produced archeochemical evidence of beer in ceramic pots, mushrooms wrapped in fern fronds, and jimson weed which contains a number of visionary properties.</p>	Soni et al., 2012; Yáñez et al., 2001



Spain, Tarroana Calvari d'Amposta	Prehistoric	<i>Rituals:</i> Undisturbed burial cave contained hallucinogenic beer that was consumed during the mortuary ceremonies.	Guerra-Doce, 2015
Spain, Pintia, Necropolis of Las Ruedas, Vacceans	2 nd century BCE	<i>Rituals:</i> Evidence of a special brew with psychedelics during a funeral feast ritual. Investigators called it "psychotropic beer" consumed during a funeral feast with "clear intent" of propelling an otherworldly journey "to the beyond" (Sanz Mínguez et al., 2003, 155, 157, 316) translated by Muraresku (2020, p. 143).	Muraresku, 2020; Sanz Mínguez et al., 2003
Turkey, Gobekli Tepe	Neolithic period	<i>Rituals:</i> Rituals with dancing that might induce an altered state of consciousness. Psychoactive beer perhaps allowing communion with the ancestors (Dietrich et al., 2012). Humanities first ritual beverage to facilitate interaction between living and the dead (Gresky et al., 2017).	Dietrich et al., 2012; Gresky et al., 2017
Greece, Crete Minoans & Mycenaens	16 th century BCE, Bronze age	<i>Rituals:</i> Archeochemical evidence of ritual cocktail in large quantities in a ritual setting.	McGovern, 1999, 2009
Greece, Gordium, Royal Tomb Anatolians	8 th century BCE	<i>Rituals:</i> Archeochemical evidence of psychoactive beer, ritual potion used in afterlife and death rituals.	McGovern et al. 2008, 2017
Italy, Pompeii, Villa Vesuvio	2 nd century CE	<i>Rituals:</i> Roman Refrigerium ritual. <i>Ritual Components:</i> Psychedelic ritual potions, altars. <i>Emergent Mechanisms:</i> To summon the dead back from the grave, access to spiritual realms and the ancestral spirits.	Ciaraldi, 2000; Macmullen, 2010, 2017
Italy, Benevento	Middle Ages	<i>Rituals:</i> Renaissance witches practicing rituals with sacrament infused with psychoactive compounds .	Ginzburg, 2004; Hatsis, 2015
Greece, Eleusis, Phoenicians	1500 BC- 392 CE	<i>Rituals:</i> The Greek Mysteries, famous, well attended underworld contact rituals incorporating a drugged wine offering transformation from mortal to immortal. While archeochemical data has not yet been found, textual accounts of a psychedelic sacrament, Kukeon, has been found in numerous texts. Initiates of the rites earned the title Epoptes which translates to "the one who has seen it all" (Muraresku, 2020, p. 27). Plato described his experiences of the ritual elixir, Kukeon, while participating in The Mysteries as having "blessed sight and vision" (Muraresku, 2020, p. 127). <i>Ritual Component:</i> Sacrament. <i>Emergent Mechanisms:</i> Access to non-ordinary knowledge, visions, dying before you die.	(Bowden, 2010; Burkert, 1985; Gordon Wasson et al., 2008; Harissis, 2014; Kerényi & Kerényi, 1991; Muraresku, 2020; Mylonas, 1933; Ruck, 2016; Valamoti, 2013
Italy, Magna Graecia, Phoenicians	600-400 BCE	<i>Rituals:</i> Mystics were quoted having transcended space and time to contact the deceased ancestors in the underworld.	Kingsley, 1999
European, Christian Gnostics	3 rd century CE	<i>Rituals:</i> In the Marcasian rituals, female Gnostics used a drugged wine in the early third century CE described by Hippolytus as a pharmakon.. <i>Rituals Components:</i> Prayer, sacred objects, invoking the calling of the God Charice (the one who transcends all knowledge and speech). Gnostic is derived from gnosis Greek translation "knowledge." Gnostics used the term to mean "insight" involving an intuitive process of knowing oneself. <i>Emergent Mechanisms:</i> Prophecies, self-knowledge, and mediumship .	Hippolytus, 2014; Muraresku, 2020; Pagels, 1989; Saint Irenaeus (Bishop of Lyon), 1857

reported that they experienced improvements in memory and concentration, persistent positive mood states, fulfillment in day-to-day interactions, an increased sense of purpose, and increased meaning and coherence in their lives. In this study, researchers noted it was not possible to determine how much of these changes can be attributed to the entheogen itself as opposed to the ceremonial and community context. They suggest future research be focused on ceremonial structure and safeguards. Other

studies on subjects of entheogenic rituals were focused on risk assessment (Doering-Silveira et al., 2005; Fábregas et al., 2010; Gable, 2007; Halpern et al., 2008), pharmacological mechanisms, biochemical theory, therapeutic effects (Brierley & Davidson, 2012; Halpern et al., 2008; Liester & Prickett, 2012; Thomas et al., 2013), and ethnographic understanding of healing and ritual culture (Calabrese, 2013; Labate & MacRae, 2016).

Trichter et al. (2009) conducted another mixed-meth-

ods study of ayahuasca drinkers in a ceremonial setting. Their research concluded that participants had positive spiritual experiences during and after the ceremonies. Emergent mechanisms can be identified in the participants' reports of this study indicating access to non-ordinary knowledge including: insights and revelations into the physical, psychological, emotional, and spiritual health of the participants; and a sense of unity with nature, humanity, and the Divine. Psychological measures showed that ritual experiences were integrated into the participants' daily lives and manifested as increased empathy; increased feelings of gratitude and peace; and an increased sense of responsibility for themselves, others, and the world. However, the researchers did not publish their numerical data for review in this article making it difficult to evaluate the claims. The researchers encourage further investigation into the value of the spiritual setting for ayahuasca benefits to explore whether psychedelic medicine and entheogenic healing has different outcomes in different contexts.

There are study findings that suggest a relationship between ritual effects and collective awareness and collective experiences. In 2017, Talin and Sanabria published an ethnographic study on the ritual use of ayahuasca to heal addiction. They concluded ritual context providing a cohesive community for a sense of belongingness and caregiving to the addicts is a factor that is necessary for sustained treatment outcomes. This concurs with Agin-Leibes et al.'s (2021) study findings for a group therapy format. Winkelman's (2001) work also found the following outcomes to the ritual context: enhanced social solidarity, improved interpersonal and community relations, and strengthened social identity and group cohesion. Understanding how the ritual components and emergent mechanisms may create a collective phenomenon is an area ripe for research. This will be further explored in the discussion section with a provided framework on a possible way to situate this study.

Loizaga-Velder and Verres conducted a qualitative empirical analysis exploring ayahuasca rituals that affirm the findings of entheogens as a substance-dependence treatment in a "carefully structured setting" (2014, p. 63). The authors determined that both set (preparation and intake) and setting (the quality of containment, guidance of the experience, and appropriateness of the therapeutic framework) are all variables that affect outcomes particularly as it relates to the influence of an altered state of consciousness. They also conclude that integration of the experience and implementation of insight is correlated with enduring behavioral change.

CONFLICTING PARADIGMS OF HEALING

Healing is the emergent mechanism common to both

psychedelic-assisted therapies and modern entheogenic rituals. Healing is also a significant motivation for ancestral reliance (Gordon Wasson et al., 2008; Muraresku, 2020; Piper, 2013; Ruck et al., 1979; Rush, 2013; Valamoti, 2013), for newcomers (Leger & Unterwald, 2022; Maia et al., 2022; Schimmel et al., 2022; Smith et al., 2021; M. J. Winkelman, 2007; Zeifman et al., 2022), and for continued modern entheogenic ritual practitioners to seek out the therapy in either context (Alverga, 2010; Fotiou, 2012; Frenopoulo, 2008; Goldman, 2010; Goulart, 2011; Labate et al., 2010). The scientific investigation on the healing effects of both contexts has centered on the clinical psychological and social outcomes of entheogen/psychedelic use. Additionally, as cited throughout the Identifying Emergent Mechanisms of Rituals section, there are significant reports of healing effects embedded in the emergent mechanistic experiences. Altered states of consciousness, mystical experiences, transcendence, revelations, Divine guidance, non-ordinary knowledge, visions, contact with healing beings, and mediumship all share a relationship to the healing experience (Alverga, 2010; Goldman, 2010, 2014; Gordon Wasson et al., 2008; Labate & MacRae, 2016; Liu et al., 2018) (see also healing references and citations in Table 2). In fact, the healing experience is attributed to the ritual in its entirety not only to the partaking of the entheogen alone. To understand this attribution, one must first understand the paradigm of healing that entheogenic practitioners operationalize.

The ideal environment for studying the entheogenic ritual healing paradigm is within the Ayahuasca traditions where ritual healing with a sacrament is the center of the practice. In fact, based on her research, Goulart (2011) describes the Santo Daime as a healing cult due to the origins of entire ceremonies being dedicated to healing. The religion of Santo Daime attributes the healing intervention to both the plant and the spiritual experience produced within the ritual referred to as "works" in this doctrine (Alverga, 2010; Goldman, 2010, 2014; Labate & MacRae, 2016). Goulart's work investigates both the theological perspective of healing in the Santo Daime doctrine and its specific manifestations within the rituals. However, there is little peer-reviewed evidence published with an English translation focusing on elucidating the spiritual healing paradigm in modern entheogenic ritual context. This is problematic for research study design. Current ritual research cited under the Research on Modern Entheogenic Rituals section of this paper are based on the medical model of psychological healing rather than the healing paradigm held by the practitioners themselves. Therefore, there is an inherent bias preferencing the clinical medical paradigm of healing in the research design from the outset. Some work has been done to compare psychological medical healing and

spiritual ritual healing (Hultkrantz, 1992; Thomason, 2010). More investigation needs to be done to elucidate the spiritual paradigm of healing specific to entheogenic rituals according to the views of the practitioners so research philosophy and design can account for any differences affecting analysis and interpretation.

Due to the small amount of evidence for interpreting entheogenic healing philosophy, this researcher has conducted some investigation into the Ayahauscan Religion Santo Daime using four secondary sources (Alverga, 2010; Goldman, 2010, 2014; Labate & MacRae, 2016) and one primary source (J. Goldman, personal communication, February 16, 2020). None of these source publications have been peer-reviewed. Theological and anthropological study and Santo Daime practitioner interpretations reveal an assumption of a healing capacity which inherently exists in all life (Alverga, 2010; Goldman, 2010, 2014; Labate & MacRae, 2016). This serves as the foundation for the entheogenic ritual healing paradigm. There is an appeal to a stronger force or Divine being that can be resourced to increase this inherent capacity for wholeness, health, and well-being. In this context, the sacramental brew is but one aspect of the ritual that exists to invite and support healing. The entire ceremonial process is designed to create a synergistic experience giving access to the emergent mechanisms that is more than just the mere sum of its parts and results in healing on many levels of individuals' existence.

An interview conducted by this author on the experiences and interpretations of a Santo Daime elder, ceremonial leader and teacher, and healing medium (Goldman, 2010, 2014) reveals the doctrinal understanding of healing from his perspective. Jonathan Goldman founded the first Santo Daime church established outside of the home country of Brazil, and the first entheogenic church in the United States. He was the principal plaintiff in the successful court case against the federal government that resulted in the legalization of the ceremonial religious use of an entheogenic sacrament in 2009. Goldman, who began drinking the Daime sacrament in 1988 and leading ceremonies in 1993 (Goldman, 2010), has since spent three decades studying the Santo Daime doctrine and spiritual practices. The comments below testify to his account of the religious teachings and practices as it relates to healing and entheogenic ritual use. With respect to human healing:

Healing is accomplished with the arrival of the inner state of all the levels of a person being in a harmonious working relationship. [He identifies these levels as etheric, emotional, mental, and spiritual.] This occurs through a profound process guided by the intention to put the heart in vibrational charge of the establishment and maintenance

of that harmony, and placing the spiritual aspect of the person's being as the overseer of the mental and emotional aspects. In this way, the whole human body with all its layers is consciously linked to the inherent harmony of nature. This is authentic healing. All healing modalities can fit into this paradigm. (J. Goldman, personal communication, February 26, 2020)

On the sacrament and the importance of the ceremonial context, Goldman responds:

Since human beings are fundamentally spiritual entities bound in a temporary human case—when layers of consciousness are opened by psychoactive substances, the inherent spiritual nature will make itself known regardless of the setting. However, a setting that acknowledges this true nature will make the unfolding of the spiritual self smoother, more complete, and long lasting. (J. Goldman, personal communication, February 26, 2020).

With respect to studying entheogens out of their ceremonial setting:

It is understandable that those seeking to legitimize the use of these most helpful substances will try to limit their inquiries and therapies to the more widely accepted parameters of belief. However, this does not change the truth of spiritual reality, nor the necessity of addressing it and including it if real healing is to be facilitated. (J. Goldman, personal communication, February 16, 2020)

Winkelman (2007) implies a similar definition of healing promoted by psychedelic therapy when he refers to it as a psychointegrator. Psychointegrators stimulate "emotional and mental processes through the use of a physiological dynamic that forces the organism towards an integrative holistic growth state in the integration of soul, mind, and spirit for growth and development" (Winkelman, 2007, p. 7). In 2012, Fotiou published his ethnographic work on contemporary ayahuasca ritual healing. Fotiou's findings concur with Winkelman and Goldman's definition of healing as an integral process that involves all three dimensions of our being—physical, psychological, and spiritual. Illness is viewed by the ritual participants to be a sign of psycho-physiological imbalance caused by spiritual, animistic, or social forces. In this study, Fotiou discovered Westerners are drawn to the rituals because, according to them,

there is an added understanding of the spiritual dimension of healing combined with the physical aspect atypical of Western medical and psychological approaches. In the spiritual view of healing, a crisis is involved that precipitates the healing process, requiring the experiencer to take responsibility for initiating and collaborating in a healing process that uniquely fits that individual (Bragdon, 1990). The healing that occurs must involve all levels of the human—mind, body, and spirit. This understanding of healing has served as a core principle of Eastern healing practices such as acupuncture, shamanic healing, Tai Chi, Qigong, and Yoga for thousands of years (Levin, 2008; Moodley & West, 2005).

To investigate the effects of healing in both clinical and ritual contexts, it is important to consider how the psychological and allopathic scientific community perceives healing within a clinical context in contrast with the entheogenic ceremonial practitioners' paradigm. The Santo Daime's theological view of healing and the spiritual understanding of healing cited above is outside of the current medical model's framework for explaining the human body, health, and healing.

In the clinical medical perspective, the healing paradigm involves a symptom, diagnosis, and treatment model—a series of causally related events. It is generally focused on either the body or the psyche in isolation from each other, except in the case of a drug intervention for mental health diagnosis. In this context, illness is believed to be caused by external conditions. Additionally, treatment generally must come by applying an outside intervention. This understanding of healing is ubiquitous not only in Western medicine but it is the predominant understanding of healing in Western culture that has had global effects with the spread of Western medical aid and intervention (Ibeneme et al., 2017).

The allopathic understanding of psychedelics as a therapeutic intervention is based on neural mechanistic theories and the interactions of psychedelic chemical compounds. This perspective forms the basis of clinical investigations and the proposed models for explaining how and why psychedelic-assisted therapies are effective as treatments (Herzog et al., 2020). These models propose that psychedelic treatment facilitates interactions among mechanisms and functions of the brain which affects processes related to behaviors, emotions, attachments, and memories. Winkelman (1996, 2001, 2007) and Galimore (2015) identified psychedelics as having a psychointegrative function with neurological effects that produce an integration of various psychophysiological processes, a biologically driven psycho-integration.

The medicinal perspective of psychedelic healing nature is reduced to its molecular constituents impacting an

individual's neural biochemical structures. This contrasts significantly with the medicinal entheogenic view of the sacrament containing a Divine intelligence derived from the plant who imparts knowledge and healing (Goldman, 2010, 2014; Mayerson, 2001; Müller, 1847; Muraresku, 2020; Ruck et al., 1979). From the perspective of the communities who use ayahuasca in their spiritual practices, the brew has diagnostic and curative attributes that are given by supernatural forces rather than by the chemical constituents (Alverga, 2010; Goldman, 2010, 2014; Tupper, 2009a, 2009b; Tupper & Labate, 2014).

In the spiritual context, healing is attributed to more than a linear relationship of diagnosis and treatment delivered through a physical medium such as a drug. There is an acknowledgement of the interconnected aspect of the mind, body, and spirit where healing effects occur in all three aspects of a person. Studies show that mystical experiences in the transcendent, altered state of consciousness are fundamental to healing outcomes as they correlate with enduring positive changes in psychological functioning and in prosocial behaviors (Barsuglia et al. 2018; Griffiths et al. 2006, 2016). In a ritual context, entheogen practitioners see the spiritual encounter facilitated by the entheogen in the ritual context as a therapeutic event (Alverga, 2010; Goldman, 2010, 2014; Labate & MacRae, 2016; Tupper & Labate, 2014; Winkelman, 2001, 2007). According to Bossis, a psychedelic researcher at New York University, "the whole point of . . . psilocybin interventions is to trigger the same beatific vision that was reported in the Greek Mysteries for millennia" (Well, 2018). In fact, the data shows that the more robust the mystical experience, the greater the magnitude of clinical change (Barrett & Griffiths, 2018).

In the medical repurposing of clinical psychedelic-assisted research, cultural bias preferencing the medical model's paradigms of health and healing also needs to be examined. Studying philosophy and design with embedded cultural bias might be preventing the realization of valuable discoveries of emergent mechanisms, their role in healing, and the role of consciousness in healing overall accounted for by practitioners in the ritual context. For example, while reviewing the literature, this author found on more than one occasion, researchers referring to the reports of emergent mechanistic experiences of those who practice entheogenic ritual healing as beliefs such as "ayahuasca visions are believed to allow communications with the spiritual realm" (Tupper, 2009a, p. 277). By contrast, whenever scientific ideas were conveyed, they were never framed as beliefs. This reflects Western cultural bias for the authority of scientific discovery while reducing subjective experiences and non-ordinary knowledge as mere belief. Tupper (2009a) uses the term belief/believe to refer to spiritual

practitioners' experiences six times but not once when referring to scientific ideas. Winkelman's (2007) article also describes belief a total of six times when discussing spiritual understanding but never for scientific claims.

Fotiou's (2012) findings reveal that the denial of the spiritual role for understanding health and healing as a cause for Westerner's seeking out foreign contexts, where the role of consciousness in healing is not only recognized but in the forefront. This is an important consideration for Western healthcare researchers and professionals to heed for the future. Contrasting the two paradigms makes clear the need for a new framework of investigation if the healing effects of entheogenic rituals are to be adequately investigated free from cultural bias. The following sections will provide some suggestions for a philosophical shift in research approach. It will introduce a framework for supporting the proposed alternative philosophical approach to support both empirical and subjective study designs.

ADVANCING THE PSYCHEDELIC RESEARCH THROUGH THE RITUAL CONTEXT

The chosen research philosophy and the accompanying research framework that form the basis of psychedelic/entheogen field of study must be sufficient to contain the varied and complex, multidimensional phenomena that occurs within a ritual context. This is vital to the development of the research approach and design and thus the success of the findings with respect to mechanisms, variable relationships, and outcomes. The research philosophy provides the groundwork while the framework provides the structure for investigation. Both the research philosophy and the framework must be expansive enough to include the nonphysical aspects of the entheogen ritual context and the synergist components and emergent mechanisms.

CONSIDERATIONS FOR RESEARCH PHILOSOPHY

Entheogenic rituals is one of the possibilities for examining context within the psychedelic-assisted therapy research. While there are many directions entheogenic ritual research could take, to date the only one examined, in a limited manner, is the healing effects according to the Western medical model healing paradigm. Future directions should include examination of the healing paradigm as understood by the ritual practitioners followed by studies examining healing effects according to this alternative healing paradigm. Future research should also focus on the emergent mechanisms produced in the ritual environment. This focus could also be extended to the relationship between ritual components and emergent

mechanisms. New hypotheses would likely emerge from these investigations that would lead to new or more detailed study directions.

To address these proposed research directions, a new research philosophy is needed. All clinical psychedelic research currently being conducted has been designed according to a positivism worldview (Bonell et al., 2018). Positivism is the empirical method of knowledge acquisition used for validating theory (Creswell & Creswell, 2017). In most cases, it is based on data collected solely through the five senses. It is deterministic and reductionistic in that it attempts to separate phenomena into distinct parts to quantitatively determine a cause-and-effect relationship. Relying on experimental design methodology to elucidate antecedent conditions, positivistic approaches are found ubiquitously in the medical research model of quantification, controls, variables, symptom identification, diagnosis, and treatment of illness efficacy measures carrying the assumption that this leads to healing (Creswell & Creswell, 2017; Radin, 2018). Positivism aligns with the medical model assumption of the linear relationship of symptom, diagnosis, and treatment that leads to healing. A positivistic worldview assumes a different paradigm of health and healing from the one of practitioners who use entheogens for spiritual awakening and integrative healing purposes (Tupper & Labate, 2014). Therefore, relying on positivism research methods may not be the solution to a complete understanding of entheogens as agents of healing, the role of emergent mechanisms, and the synergistic relationships created among all the ritual activity. The call to attention on research context within the psychedelic-assisted therapy research represents an opportunity for the scientific community to consider if its study would benefit from a more expansive perspective than the philosophical worldview of positivism underpinning clinical trial research.

The hypothesis of this manuscript is that the components of the ritual context including the ingested entheogen give participants access to discrete planes of reality where the emergent mechanisms become accessible. These discrete planes may be a container for non-ordinary knowledge, insights, access to Divine Beings, and other emergent mechanisms reported throughout the literature cited in Table 2. A positivism approach would require a stripping away of the ceremonial elements as controlled variables in search of the mechanistic, linear, cause-and-effect relationship between each component and healing outcomes. If emergent mechanisms arise from the synergies of the component variables working in tandem as Clark suggests (2013), they would be eliminated in the controlled clinical context from the observational environment preventing researchers from understanding the full

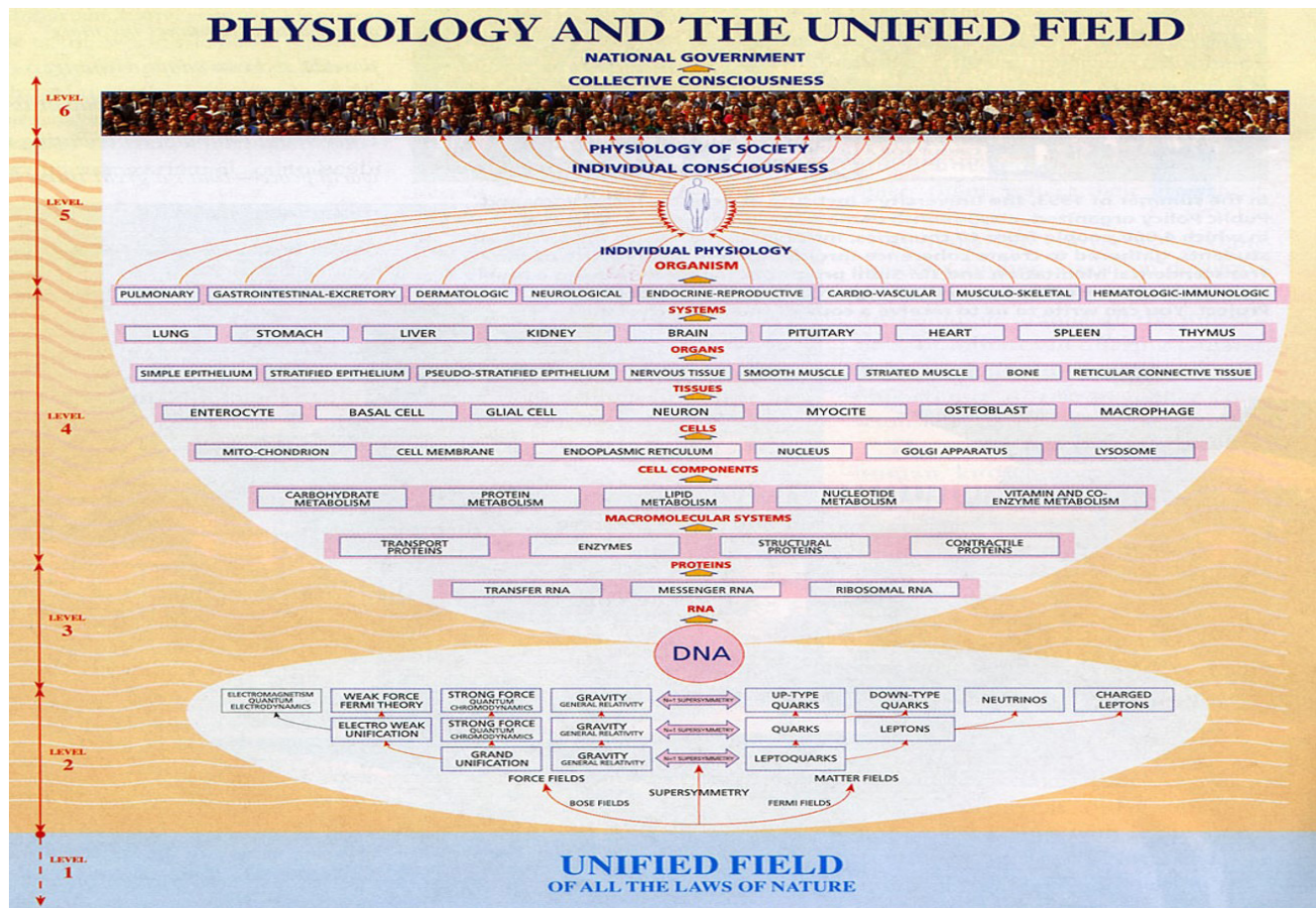


Figure 1. Physiology and the Unified Field. (Copyright, all rights reserved, Maharishi International University, 2021)

effects of the ritual environment on healing as well as other corollary effects provided by the experiences.

The emergent mechanism concept of non-ordinary knowledge is based on a special type of knowing that Plato called gnosis (Radin, 2018). The knowledge one gains through gnosis is distinct from intellectual or rational knowing applied in positivistic methodology. It is its own specific state of consciousness. This notion of noetic understanding contrasts significantly with scientific ideology and its understanding of empirical methods of knowledge acquisition. Therefore, a science based only on positivism may be distorting an understanding of human nature and the nature of reality (Tupper & Labate, 2014). Radin’s research suggests that by focusing the scientific method “inward and exploring what consciousness is capable of” we can “find whole new realms of knowledge” (2018, p. 2). Radin describes this space as “the psychophysical nature of reality . . . mysterious interstitial space shimmering between mind and matter” (2018, p. 3). It is beyond the experiences drawn from the five base senses of normal waking consciousness. It is this non-ordinary knowledge that is perhaps contained in the discrete planes of the nonphysical

described by Thompson (2021). This is what both ritual practitioners and spiritual mystics have described throughout history. If this hypothesis is to be tested, scientists need a research methodology that would be expansive and inclusive enough to include mixed-method students with positivist approaches providing adequate space for investigating the possibility of the nonphysical plane and the experiences it may contain. Two alternative research philosophies for incorporating mixed methods study designs are critical realism and the pragmatic worldviews.

A critical realist worldview takes the position that reality can never fully be known and measured (Sturgiss & Clark, 2020). In this theory, perceptions of reality are seen as distinct from a reality that exists beyond our subjective perceptions (Radin, 2018). Applied to research, this philosophy aims to answer research questions beyond reductionistic causality, examining how and why complex interventions and programs work. In fact, Bonell et al. (2018) concluded that the most suitable paradigm for studying social interventions is realism.

Similar to the critical realist philosophy, a pragmatic worldview assumes that a researcher’s perceptions of re-

ality are not synonymous with the totality of reality (Creswell & Creswell, 2018). However, this perspective does not distinguish between a subjective and objective reality as the critical realist assumes a truth that continuously manifests from the context, constituents, and the motion thereof. Pragmatists are concerned with application, consequences of actions, and solutions (Cherryholmes, 1992; Creswell & Creswell, 2017; Patton, 1990).

Both critical realists and pragmatists are proponents of using mixed methods study designs. This shift would move researchers away from foundational cause-and-effect and reductionistic-oriented assumptions thereby avoiding scientific bias resulting from positivist scientific theory that blinds the researcher to emergent variables so obvious to entheogenic ritual practitioners and clinical psychedelic experiences. Critical realists and pragmatic research philosophy are both well suited for examining context (Carhart-Harris et al., 2022; Young, 2022) because the researcher is free to choose the methods, techniques, and procedures that best meet the needs and purpose of the research question rather than subscribing to only one method such as clinical trials. It provides a platform for utilizing mixed methods research to access varied forms of data collection and analysis providing a more comprehensive examination of what could be occurring in any given phenomenon.

THE RESEARCH FRAMEWORK: THE UNIFIED FIELD

A new research philosophy is necessary, but it is not enough to address the complex nature of entheogenic research for studying the healing paradigm, activity, experiences, relationships, and outcomes. A model is needed that would include the discrete levels of reality from the nonphysical to the physical, providing a basis for how to examine them in a ritual context. The Physiology and Unified Field Chart (Figure 1) provides a framework for analyzing and interpreting the multidimensional levels that are interrelating within the ritual context.

Figure 1 is based on the unified field of natural law derived from the quantum field theory. According to Nader et al. (2001), the unified field theory has mathematically evidenced that the four primary force states naturally progress toward unification into one single quantum field also known as the Unified Field of Superstring Theory. The unified field contains additional types of fields, or as Thompson (2021) terms them: discrete planes, such as long-range force fields, very light superconducting cosmic strings, and magnetic monopoles (Nader et al., 2001). Figure 1 includes multiple levels of reality from the unified field to the non-physical quantum to the physical levels. It is a mapping of

how the various discrete levels of human and collective physiology relate to one another throughout these levels. It is a representation of the Unified Field of Natural Law characterized by infinite correlations and serving as the basis of all relationships in the universe (Nader, 2021); therefore it is comprehensive enough to examine the complex nature of ritual dynamics, mechanisms, and outcomes.

The first level, depicted as the unified field, mathematically evidenced and described in quantum physics has also been described in the consciousness philosophy literature. Reports of a nonphysical, intelligent dimension were showing up in physics theory as early as the late 1800s and taking root in the 20th century. Stewart describes it as a “Living intelligent universe . . . the production of the visible universe brought about by an intelligent agency residing in the unseen” (Stewart, 1878). Quantum physics refers to it as the Unified Field of Superstring Theory (Ellis, 1986; Nader, 1995, 2001, 2021; Nidich et al., 2001; Schwarz, 1985). The unified field is hypothesized as the field of universal or nonlocal consciousness (Nader, 2021). Scientific philosopher and systems theorist Ervin Laszlo referred to the unified field as “Quantum Consciousness” or “Quantum Mind” in his theories (Laszlo, 2007, 2009, 2014). He proposed that the activity of quantum mechanics and superposition may be the foundation for explaining consciousness. His theory of the A-field (Akashic field) is described as a “pre-space based on the quantum vacuum containing fluctuations; the information carrying plane” (2007, pp. 68–69).

Theology, theosophy, and early philosophers also made contributions to the study of this intelligent, non-physical dimension. The akashic record is a “concept describing a space that contains information about everything in existence since the dawn of time; a place in which all matter sprang which has an archival function for the universe, holding knowledge of the past, present and future (Nash, 2020, p. 110). Akasha, in the context of a location, comes from the Sanskrit word, Akasa which is translated as “space, atmosphere, or sky” (Pokazanyeva, 2016, pp. 325–326). This term has similar meanings in the branches of Vedic and Buddhist traditions (Nash, 2020). In Vedic understanding, Akasa is one of the two materials that make up the known universe, the space containing all matter and motion, the infinite void. In Buddhism, versions of Akasa incorporate meanings of space element which indicates boundary of matter, endless empty space that has no place in objective reality, the unconditioned or uncreated states. In Western theosophical study, aether was the term similar to Akasa (Nash, 2020). Introduced originally by Aristotle and reintroduced by Rene Descartes in the 17th century (Gaukroger, 1998), aether was seen as a valid explanation in physics as the intervening substance for the classical Newtonian forces (Barrett & Griffiths, 2018).

Akasha as a formal term came up in Blavatsky's work described as the source of all existence. "... the One Element. . . . Space, Akasha, Astral Light - the Root of Life" (Blavatsky, 1888, p. 314).

According to Nash's theological, Indian philosophical, and theosophical synthesis of the study of the unified field, those who gain access to the Akashic records could attain absolute knowledge beyond the normal waking state of consciousness. The field is related to the concepts of omniscience, parallel dimensions, and predestination (2020). These descriptions match descriptions given by entheogenic practitioners as identified in Table 2. The subjective and objective evidence of humans accessing the discrete, nonphysical planes of existence containing healing and non-ordinary knowledge is prevalent enough in numerous disciplines to warrant increased attention in a wider, more comprehensive scope of investigation.

Level 2 of Figure 1 depicts both the quantum and classical fields of physics. The quantum field is also known as the unmanifest field of intelligence (Nader, 1995, 2001; Nidich et al., 2001). Thompson's proposed mathematical model of three discrete degrees in causal order: Quantum field theory---->Quantum Mechanics---->Classical Newtonian Physics (2021) can be found in level 1 and level 2 of Figure 1. Thompson lays out a mechanistic case for how the nonphysical effects influence via the Quantum field (level 1) which then affects protein folding (level 3) via the quantum mechanical plane (level 2). Non-physical forces (level 2 forces) are described by Thompson as mental phenomena such as intentions, thoughts, ideas, spiritual phenomena. Thompson highlights the discrete planes of existence in ordered lists containing emergent mechanisms within level 2—spiritual purposes, mental, intentions, sensorimotor minds, spiritual bodies, final causes, and physical objects. Thompson's proposal assumes a prediction that non-physical influences in living cells are the directors of protein folding arrangements affecting speed and location; however, the exact force that directs this remains unidentified within the field of biophysics.

The ritual components of attention and intention (level 2) are described as essential in opening to the emergent mechanisms by several researchers, although various synonymous terms are being applied. Radin speaks of the significance of attention and intention in terms of psi abilities and magic, which he has categorized as "mental influence of the physical world, perception of events distant in space and time, and interactions with nonphysical entities" (2018, p. 1). These categories of emergent mechanisms correlate with Thompson's mathematical model for describing how the nonphysical influences the physical.

In Schwartz's (2018) studies on psi ability, cathedrals were found to be more easily and clearly viewed by remote

viewers (the ability to sense distant or unseen targets purportedly through the mind) than a basic warehouse of the same size and shape. He attributes this finding to the effects of a group of people holding intentional focused awareness (level 2 emergent mechanism) in an emotionally charged state. Rituals and emotional arousal share a relationship (Schwartz, 2018; Summers-Effler, 2006). Emotions which become attached to the symbols in the dedicated space led to increased bonding among participants (Summers-Effler, 2006). Cohesively, shared emotional states may play a mechanistic role in the remote viewing ability. The central nervous system's limbic system is the biological system related to the regulation and expression of emotional states. This system is represented by level 4 in Figure 1 (Unified Field).

Hartelius et al. (2022) published an electroencephalogram study which confirms that patterns of neural activity correlate with positive emotional states and voluntary control of attention. Their study confirms the theory of an operational cognitive process under voluntary control known as a somatic seat of attention and its relationship to emotional states. Collin's research (1990, 2014) agrees that emotions play a significant role in ritual effects. Additional contributing factors include focused, unified, rhythmic actions (Schwartz, 2018; Summers-Effler, 2006). When this data is analyzed collectively, level 5 emerges as the intersection of individual and societal physiology. Level 5 may serve as an understanding for the collective dynamics accounted for in the studies on entheogenic rituals revealing the qualitative experiences of enhanced group cohesion, belonging, solidarity, improved interpersonal relations and strengthened social bonds (Agin-Liebes et al., 2021; Talin & Sanabria, 2017; Winkelman, 2001). Ritual participants' actions serve to strengthen brain entrainment among the group which in turn creates strengthened collective intention which could also be seen in terms of level 6—Collective Consciousness in Figure 1. Brain entrainment (level 5) creates a coherence of intentional awareness and causes synchronization of brain waves (level 2) (Schwartz, 2018). Schwartz (2018) claims that it does not matter what the ritual is, all that is required is that the ritual allows you to attain and sustain intentional, focused awareness. According to Schwartz, intentional observation may also produce an effect in the informational architecture in nonlocal consciousness (level 1) that is represented by the physical presence of that designated sacred place. He explains that we are beings of consciousness and that most of the time our minds are overwhelmed by the sensorial input and the resulting mental noise (level 2) produced by it. This sensorial overwhelm causes our brain functioning (level 4) to be hyperactive. He states that ritual practice, much like meditation, is the key for calming this mental hyperactivi-

ty and the overall physiology in order to create intentional focused awareness.

This author's hypothesis is that the ritual along with its ritual components are key to accessing the nonphysical levels 1 and 2, giving rise to the emergent mechanisms. The evidence in Table 2 suggests that our ancient and modern ancestors, modern tribal societies, and the Spiritist traditions perhaps understood this and relied on the entheogenic plants in a ritual context to provide access to the emergent mechanisms of healing and knowledge. Across disparate time periods and regions of the world, entheogenic ritual practitioners, who would have likely had no physical contact with each other, used psychoactive substances, shared many ritual components, and reported synonymous emergent mechanisms. This would not have been possible with the current scientific belief that knowledge acquisition occurs through cognitive processing based only on the five basic senses. One possible explanation is that the emergent mechanism of non-ordinary knowledge transfer via level 1 and 2 was at play within the ritual. This question warrants deeper investigation into what non-ordinary knowledge the ritual context may provide. If this non-ordinary knowledge is contained in level 1 and 2 of the unified field, then studying rituals with their components may help us understand the emergent mechanisms and gain access to new non-ordinary knowledge reported by ritual practitioners.

If the ceremonial elements work in tandem to create the potential for some ritual participants to have conscious emergent mechanistic experiences such as healing, access to disincarnate beings, and non-ordinary knowledge through the discrete nonphysical planes (level 1 and 2), studies could be designed to test this hypothesis using Figure 1 as a framework for both subjective and objective outcome measures targeting activity on multiple physiological levels. Research has shown that psychedelics induce amplified sensitivity to the environment (Carhart-Harris et al., 2018); this increased sensitivity may strengthen the possibility of access to the emergent mechanisms held in the discrete planes of the nonphysical realms. If it is also true that various physiological levels are working together to create the therapeutic and exceptional human experiences accounted for by entheogenic practitioners in the Identifying Emergent Mechanisms of Rituals Section section, Figure 1 provides a road map for study designs targeting the various physiological levels for mechanistic changes that correlate with specific emergent mechanisms. Correlation studies among the levels could also be incorporated to infer relationships among dependent variables in the ritual context. Additionally, studies are needed to compare the clinical context with ritual context for emergent mechanism outcome variation and similarities.

This framework also provides an explanation for how the two paradigms of healing (clinical medical model versus entheogenic ritual perspective) represent different aspects of the same whole. Both the medicinal concepts of neurochemical (level 3) impact on the neurophysiology (level 4) can be regarded as true as much as the Divine intelligence contained in the medicine (levels 1 & 2). This framework may reconcile any existing conflicts between the two healing paradigms. It provides a physiological explanation for the evidence found in the studies demonstrating correlations between emergent mechanisms experienced in the transcendent, altered state of consciousness, healing outcomes, and enduring positive changes in psychological functioning and in prosocial behaviors (Barsuglia et al. 2018; Griffiths et al. 2006, 2016).

CONCLUSION

This manuscript has covered a historical overview of entheogenic/psychedelic practice. It has examined the therapeutic use of psychedelics from the biomedical understanding of diagnosis and treatment found in medical science and from the ancient view of the ritual context with spiritual explanations of the therapeutic experience. The paper has reviewed several explicit and implicit ritual attributes that may play a role in the healing process. It has introduced the notion of synergistic interconnection, which the author has termed emergent mechanisms, that are part of the ritual attributes, suggesting they may play an essential role in creating access to non-ordinary knowledge and the healing experience. Finally, it has introduced considerations for alternative research design philosophy, a research framework, and identification of potential bias for study within the ritual context.

If nonphysical discrete planes exist in such a way human can consciously contact them thereby gaining access to the reported emergent mechanisms, the body of work presented here, drawn from classical philosophy, physics, history, theology, archeology, biomedicine, psychology, parapsychology, sociology, anthropology, and first-hand practitioner accounts, serves as an integrative review synthesizing evidence and theories that are relevant to this manuscript's central hypothesis. Ancient ancestors, tribal communities, and Spiritist traditions have used and continue to use entheogenic rituals to support their healing, personal development, and awareness. Rituals and their component parts may be the container for the emergent mechanisms of divine or spiritual entity contact; therapeutic/healing experiences; mediumship; accessing other realms of reality; dying before dying; sacred oneness with everything; and access to knowledge of past, present, and future. By employing intention, attention, and rhythmic

coordinated behavior in a shared physical space while consuming a common plant-based entheogenic sacrament, practitioners produce an altered state of consciousness which may provide access to non-ordinary knowledge and healing. The research presented in this manuscript indicates a need for the scientific community to increase investigation of the entheogen ritual context and its therapeutic value for psychedelic interventions. There needs to be considerations for critical analysis on research philosophy, research framework, healing paradigms, and study designs focusing on ritual components, emergent mechanisms, and overall participant effects. For this to happen, any existing bias against the concepts of emergent mechanisms and their potential role in gnosis and healing needs to be acknowledged and overcome in the study design so that research into the discrete planes of reality can be rigorously explored.

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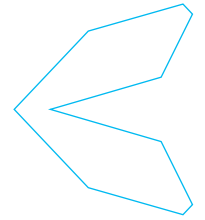
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ESSAY

Occam's Razor and Bayesian Measures of Likelihood Suggest Loch Ness Monsters Are Real Animals— An Example of Premature Discovery with Implications for Public Policy

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HIGHLIGHTS

Strong skepticism about the chances of a large animal in Loch Ness could have been reduced had scientific judgments shifted in real-time with the availability of new evidence.

ABSTRACT

Regarding claims of Loch Ness Monsters, what the simplest explanation might be depends on how the evidence is assembled and judged. Eyewitness reports can be simply and plausibly explained away as misperceptions and occasional hoaxes. Many of the claimed surface photographs can be simply and plausibly challenged as misleading representations of natural phenomena as well as some deliberate faking. Simple explanations are less readily to hand for the underwater photos and the Dinsdale film, yet disbelievers have offered some. However, when the evidence is taken *as a whole*, the simplest explanation is that there are real animals responsible for these *three or four quite independent types of evidence*. A similar conclusion is reached by considering the evidence by a Bayesian approach, progressively modifying the estimated likelihood using each independent type of evidence. How the evidence accumulated matters a great deal: If sonar and photographic evidence had preceded rather than followed intense global interest based on eyewitness reports, the existence of Nessies might have become, by about 1980, widely accepted rather than disbelieved. Loch Ness Monsters might be the sort of premature discovery described by Gunther Stent. The best evidence came too late to influence media attitudes and popular belief. The difficulty of changing long-held views is illustrated not only in this instance but also within science overall, where hegemonic theories have for lengthy periods withstood the accumulation of considerable contradicting facts. Advice to policymakers should come from people who understand such aspects of science as its fallibility and the chanciness of which data come to hand when, thereby determining initial choice of explanations that then resist displacement.

KEYWORDS

Loch Ness monsters, Nessies, Occam's Razor, Bayesian methods, cognitive dissonance, science policy



INTRODUCTION: OCCAM'S RAZOR

Science fans often like to cite Occam's Razor¹ as a criterion for evaluating theories: The simpler or simplest explanation is the one to be preferred as more likely to be true. Centuries later, Einstein suggested the corollary that explanations should be as simple as possible *but no simpler*.

What is the simplest explanation for reports of Loch Ness monsters?

That depends on how much of the claimed evidence is taken into account.

If one considers only descriptions by eyewitnesses, misperception is a simple and plausible explanation. If, however, one takes into account also the evidence of film and sonar, tangible data that remain available for repeated re-examination, the scales tip in a different direction.

For nearly a century at least, many hundreds of people have reported seeing large unidentified animals in Loch Ness. The descriptions do not fit comfortably with any known aquatic or marine animals; uncomfortably, they evoke comparisons with long-extinct, long-necked creatures. The almost universally accepted, simple, explanation is that people have been tricked into misperception or misinterpretation of natural phenomena or known animals. That simple explanation fits with much that is known about human perception and with the manifest fact that Scotland and Scots welcome the tourist traffic and sales of mementos that flow from global interest in the claimed presence of unique animals in Loch Ness.

Few people have ventured to look any further into that claim. Those who do, however, become aware that eyewitness reports are only one among several independent types of evidence that these "monsters"—"Nessies" to their fans—are actually quite real animals. Those other types of evidence (Bauer, 2002) include echoes from sonar probes, photographs (some of them underwater), and moving film.

Occam's Razor should therefore be applied also to each of those other types of evidence, and, perhaps most tellingly, also collectively: If these three or four types of evidence, quite different from and independent of one another, are all compatible with the presence of large aquatic animals, is that not a much simpler explanation than that *similarly misleading* artefacts are somehow present in observations over many decades by sonar, *and* in underwater photography and surface photography, and even in moving film? Artefacts in quite different modes of observation, that all nevertheless manage to simulate animate creatures?

The existence of Nessies is then the simplest explanation for the totality of the evidence. Moreover, at-

tempts by disbelievers to explain away individually each of the different bits and types of evidence do not stand up well to challenge.

Misperception

It is certainly more than likely that many people have misinterpreted natural phenomena, assisted to some degree by expectation based on publicized claims of the reality of Nessies. Indeed, quite a number of claimed sightings have been shown definitively to be misinterpretations of wind or wave or light effects, or of duck families; a detailed description of the many potential sources of misperception is set out in the Appendix. Among actual animals that could be mistaken for Nessies are seals, which are known to enter Loch Ness at times: I was momentarily excited, one morning in 1985, when a seal poked its head out of the water near the north shore of Urquhart Bay.

That misperceptions may be common does not, however, provide in itself a particularly compelling explanation for all of the many hundreds of independent reports (see for instance Mackal, 1976, pp. 83–92, 224–269), some of them simultaneously by separate groups of people at different places around the Loch; and the considerable number of reports from local people who are likely to be familiar with wave and wind effects and with local animals; for instance Mrs. Ross, whose kitchen window overlooked Urquhart Bay,² or Dick MacKintosh,³ a lifelong fisherman with a holiday cottage overlooking Urquhart Bay.

Sonar

Many independent investigators over several decades using different types of sonar apparatus have recorded echoes that appear to be not from shoals of fish but from single objects larger than seals (Witchell, 1989, pp. 125 ff., 141 ff., 193 ff.). A number of those echoes have been from targets moving quite rapidly, typically coming up from or moving down toward considerable depths.

The simple explanation is that echoes from apparently single and large targets, moving rapidly, are owing to reflections from animals.

Alternative explanations offered by disbelievers for these echoes are neither specific nor simple: allegedly from the distant sidewalls of the loch, or from some sort of layers in the water, thermoclines or seiches (Shine, 2006). But no actually observed examples have been offered of this type of artefactual echo from a thermocline layer; nor of sidewall echoes that appear like moving animals, which could be sought quite easily in Norwegian

fjords, for instance.

Surface Photography

Quite a number of purported surface photos have been publicized. Some of them are almost universally agreed to be fakes or hoaxes: those by O'Connor (Mackal, 1976, pp. 104–106), Searle (Witchell, 1979, pp. 184–185; 1989, 137–139), Stuart (Whyte, 1961: facing p. 44; Witchell, 1989: pp. 82–84).

Several are regarded as genuine by some but spurious by others, most prominently the most iconic one, the "Surgeon's" (Martin & Boyd, 1999; Shuker, 1995, pp. 87–88); also that by Cockrell (Mackal, 1976, pp. 103–104).

Others are accepted as not faked but alleged by some critics to be misinterpreted: the MacNab (Mackal, 1976, pp. 103, 273–276), the Hugh Gray (Mackal, 1976, pp. 94–96, 114), the Tait,⁴ and again that by Cockrell.

All the photos are independent of one another, so each calls for an individual explanation. Not all of them have as the simplest explanation, faking or misleading representation of natural phenomenon or common animal.

Overall, that some photos have been faked speaks neither for nor against the possible reality of Nessies: If they are real animals, some people would still find reason to fake pictures of them.

Underwater Photography

Attempts to explain away the underwater photographs have suggested that they somehow caught tree-stumps or rock formations or dumped machinery whose appearances happen to lend themselves to interpretation as animals of the type of reported by witnesses, namely, with long necks, reptilian facial features, and flipper- or paddle-shaped limbs.

Is it really a simple explanation, that these photos just happen quite often to look similar to eyewitness descriptions, in a body of water where sonar also appears to confirm eyewitness reports?

Moving Films

The iconic one was obtained by Tim Dinsdale in 1960. It has been featured in many documentaries and has been posted on the internet by Dinsdale's son.⁵ The only attempted explanation by disbelievers is that the dark hump that looks rather like an upturned boat is actually a small fishing dinghy that just happens under those particular lighting conditions to look not like a boat.⁶

Readers are invited to look at the film for themselves

in order to judge whether that explanation, admittedly simple, is however unconvincing. Beyond that, several of the most dedicated disbelievers have tried to film a boat in a way that makes it look like a dark hump, and they have been uniformly unsuccessful.⁷

The Simplest Explanation for all the Claimed Evidence

Both Occam and Einstein, I suggest, would agree that the totality of the evidence makes it perfectly plausible that Nessies are real animals that spend most of their time at considerable depths, appearing only rarely at the surface. It seems not only complicated but also difficult to believe that sonar equipment and photographic devices would rather consistently deliver misleading observations that are all readily compatible with what eyewitnesses have reported. Particularly perhaps since some of the underwater photos were obtained at the same time as sonar units pointing near the camera recorded large moving targets.

Admittedly, no well known creatures fit comfortably with all the evidence, and definitive proof awaits the discovery of an actual live or dead specimen, but several different types of well-known air-breathing marine animals do swim at great speeds and can dive to great depths, sometimes spending considerable lengths of time there, for instance whales, seals, leatherneck turtles (Bauer, 2020).

BAYESIAN PROBABILITY ESTIMATES

The Bayesian approach to estimating probability progressively modifies the estimates as evidence becomes available, or as several independent types of evidence are taken successively into account. Sturrock (2013) has illustrated how this approach can be applied semi-quantitatively to such controversial matters as the authorship of the works conventionally attributed to "Shakespeare" (making a strong case for Edward De Vere, Earl of Oxford, rather than the actor from Stratford on Avon).

The process starts with an initial guesstimate, the "prior probability." That starting point matters not very much, because as independent evidence becomes available, estimates become progressively better no matter what initial "prior probability" had been postulated.

The "Bayes Factor" compares the odds on the new evidence favoring or not favoring the hypothesis being tested, or comparing how the evidence fits with that hypothesis rather than with an alternative. The estimated "posterior" probability of the hypothesis being tested is modified by the "Bayes Factor" whenever new evidence

is considered.

Here, the hypothesis is that Nessies are real animals. The nature of the evidence does not allow for definitively quantitative calculation of Bayes Factors; there is no precise information available about, for instance, what proportion of claimed surface photographs are hoaxes, and what proportion are misinterpreted or misleading; nor about how frequently sonar echoes from apparently moving large targets in deep water are *not* large moving objects at all. However, as Sturrock (2013) illustrates, one can translate *rational judgments* of likelihood into reasonable numbers for probabilities or odds. Similarly, medical practice can be guided by Bayesian reasoning as to diagnosing, testing, and treatment, by giving appropriate quantitative form to the commonly made qualitative judgments based on general experience (Mitchell & Lucey, 2011): Very unlikely = <10%, Unlikely = 10% to 33%, Uncertain = 34% to 66%, Likely = 67% to 90%, Very likely = $\geq 90\%$. In the following, these are expressed as probabilities and odds by averaging and rounding: Very unlikely, $p \sim 0.05$, odds 10:1 against; unlikely, $p \sim 0.25$, odds 4:1 against; uncertain $p = 0.5$, odds 1:1; likely, $p \sim 0.75$, odds 4:1 in favor; very likely, $p \sim 0.95$, odds 10:1 in favor.

For the reality of Nessies, most people who had not yet taken any serious interest in the matter would likely assign quite a low prior probability, and Nessie fans can agree on that with disbelievers. But is the prior probability “unlikely” or “very unlikely”?

The hypothesis is a previously unidentified, large marine creature, possibly related to folklore and legend, occasionally seen at the surface, in a very deep lake that was part of the ocean perhaps ten thousand years ago. This is reminiscent of sea serpents, which may or may not exist; and of the legendary kraken, which turned out to be folklore possibly based on the really existing giant squid. There is also the completely unexpected discovery of the coelacanth, thought to have been extinct as long as the dinosaurs and plesiosaurs, as well as the megamouth shark, not previously known even from fossils. Depending on the degree of knowledge of those details and the weight given to them, some people would no doubt say $p = 0.05$ for Nessies, while others might be willing to go as high as $p = 0.25$.

The evidence began chronologically with eyewitness reports of phenomena interpreted as of animal origin, in particular a spate of publicity beginning in 1933 and continuing for several years. Some possible sightings before that have been claimed, including one from 1930 reported to the local newspaper. Many reports come from local people familiar with the area. Some significant reports stem from well-known and respected people, some of them with rather impressive and relevant credentials.

On several occasions, separate groups of people at different points on the Loch reported seeing the same thing. Eyewitness accounts were first collected and published by Gould (1934); later significant collections have been presented by Whyte (1957), Mackal (1976), and Witchell (1974).

It seems highly unlikely that *all* of these reports represent misidentifications of natural phenomenon including boat wakes, birds, seals, and so on (detailed in the Appendix), even if the first publicized sighting was a deliberate lie perpetrated to bring tourist business to local hotels (Bauer, 1986, pp. 3–4), and even if long-standing legends about water kelpies and water horses prompted wishful misidentification. As Watson (2011) has shown, reported sightings of such mythical creatures involved Loch Ness much more frequently than other Scottish lakes. So the odds that eyewitness reports of the existence of real but unidentified animals is surely somewhat better than 1:1, a bit better than $p = 0.5$, say $p \sim 0.6$, odds of 1.5:1; in other words, serious examination of all the eyewitness reports to date would likely be reflected in a somewhat “positive” Bayes Factor that would modify the low prior probability to a somewhat higher posterior probability; strong disbelief might morph into slighter disbelief, very unlikely might become just unlikely or quite unlikely.

The 1930s also brought some photographic evidence: the iconic but controversial “Surgeon’s” photograph, the also controversial one by local resident Hugh Gray, as well as some referred to in writings but no longer available. Surface photography, reviewed in detail earlier, is a truly mixed bag. Despite known fakes, some at least are genuine and appear to confirm eyewitness reports. Such apparent confirmation surely strengthens belief in both these strands of evidence. It seems highly unlikely that in a location where many people report seeing large animals, several genuine photos of natural phenomena should misleadingly mimic those reports. The probability of real Nessies, on the basis of surface photography, might again be something like 1.5:1, $p \sim 0.6$.

There were also a couple of moving films allegedly obtained by Nessie hunters in the 1930s. The Irvine is widely believed to be a hoax (Witchell, 1974, p. 57–59), but one obtained by the unofficial Mountain expedition was shown at a meeting of the Linnaean Society (1934), where experts on marine life were unable to identify what the film shows in terms of known creatures, be they seals, otters, or whales. This in itself could hardly deliver for real Nessies a probability of more than $p \sim 0.55$, odds 1.1:1, especially since the only available evidence is a written report and not the film itself.

However, in 1960 Tim Dinsdale obtained the film mentioned above, now available for everyone to see on-

line and for which the most determined activist disbelievers have failed to offer a viable alternative explanation to a large fast-moving animal. It is highly unlikely that any alternative explanation can be found; Nessie $p \sim 0.95$, odds 10:1.

The Dinsdale film led to a decade of organized searching that included an impressive number of independent sonar findings, by a variety of hunters and instruments, apparently from large moving underwater objects, sometimes tracked for a time during motion; see above. That these frequent independent findings with various equipment could all be owing to artefacts mimicking single large moving targets seems between unlikely and highly unlikely; odds against that and for Nessie, say 7:1, $p \sim 0.85$.

The underwater photos, some of them with simultaneous sonar echoes, described earlier, present a similar level of implausibility, that these could be artefacts that mimic animals of the sort described by eyewitnesses; again odds 7:1, $p \sim 0.85$ on real Nessies.

The final posterior probability is estimated by modifying the prior probability by the odds from the various types of independent evidence. The overall odds are obtained by multiplying the odds from each individual type of evidence. For eyewitness followed by photos followed by film followed by sonar and then underwater photography, we have odds of $1.5 \times 1.5 \times 1.1 \times 10 \times 7 \times 7$; cumulating to $\sim 1200:1$ to modify the initial prior probability.

Even the most pessimistic, disbelieving prior probability of 0.05, or 10:1 against, becomes quite likely when all the evidence is included, better than 100:1 that Nessies are real. If the initial guess was just unlikely rather than very unlikely, the odds on Nessie would be even better, say 300:1.

Thus the Bayesian approach to estimating probabilities converts initial disbelief in the reality of Nessies into reasonable belief or stronger, consonant with the qualitative arguments based on Occam's Razor.

This exercise illustrates more than one significant point. So long as sufficient evidence accumulates, the Bayesian approach yields conclusions that are relatively unaffected by the initial guess, the prior probability. It is also evident that the strongest evidence has the greatest influence.

FACTS AND CONVENTIONAL WISDOM

The conventional wisdom about Nessies, strongly maintained by the popular mass media, is that they are figments of myth-inspired misperception and wishful thinking, supported happily by Scotland's tourist industry and local entrepreneurs. Yet the actual evidence judged by Occam's Razor and Bayesian methods seems rather to

support the real existence of Nessies.

In the 1930s, the only evidence was from eyewitnesses, a couple of photos, and the Mountain film. There were fewer sightings and photos than have now accumulated, so instead of Bayesian factor $1.5 \times 1.5 \times 1.1$ one might venture $1.4 \times 1.4 \times 1.1 = 2.2$. With a prior probability of $p \sim 0.15$ (0.05-0.25), this yields a posterior probability of $p \sim 0.33$, on the border between unlikely and uncertain. But there had also been a highly publicized hoax in the early 1930s when a big-game hunter sponsored by a newspaper claimed to have found tracks of a monstrous creature on the shore which, it turned out, he had secretly manufactured using a memento made from a preserved hippopotamus foot (Witchell, 1974, p. 60). So it was eminently reasonable in the 1930s not to take seriously the possibility of real Nessies. The media concluded, quite naturally, that the eyewitness reports were mis-identifications and that continuing claims of wondrous creatures in Loch Ness could be ascribed to tourist-seeking publicity. For a couple of decades, that remained the way in which the popular media around the world treated the topic of Loch Ness Monster.

The Bayesian method of considering evidence progressively was applied just now in chronological order. The evidence available in the 1930s produces a Bayes Factor that does little to modify initial disbelief; the strongest evidence came only later, with the Dinsdale film of 1960, many sonar contacts from the 1950s to the 1980s and still continuing, and underwater photos in the 1970s. This suggests an interesting thought-experiment. What might the conventional wisdom be now about Nessies if global interest had *not* been aroused by eyewitness reports in the 1930s?

Imagine that the first report of something unusual in Loch Ness had been the sonar observation by a fishing trawler in 1954 (Whyte, 1961, facing p.45), of something large in deep mid-water; and that this report led to the confirming further sonar echoes reported by students from Cambridge University (Witchell, 1989, p. 118) and by electronic engineers from the University of Birmingham (Witchell, 1989, p. 125); further confirmed by the many contacts made by the Loch Ness and Morar Project in 1982 (Harmsworth, 1985, pp. 22-24; Witchell, 1989, p. 190).

Surely the media, and thereby the general public, would have taken the possibility of large creatures in Loch Ness as quite plausible because indicated by "scientific" evidence. If Tim Dinsdale had then obtained his film a bit *later*, it would have been immediately accepted as not only confirming but even advancing beyond the earlier scientific evidence. Eyewitness reports would of course have been given much credence had the sonar evidence

come first, followed by some surface photographs; and the underwater photographs with simultaneous sonar contacts by the teams of Robert Rines would then have been hailed as marvelous culminations of exploratory science.

Considered in this way, the 1930s' furor over Loch Ness Monsters could be described as what Gunther Stent (1972) labeled "premature discovery," a quite genuine discovery made before the intellectual climate in the scientific community was adequately prepared to appreciate it.

It is well-known from human psychology and sociology that facts alone, including "scientific" facts, do not suffice to change long-ingrained beliefs. Human psychology seeks to avoid cognitive dissonance and finds ways of ignoring or not noticing facts that do not fit with pre-existing beliefs (Festinger et al., 1956). The conventional wisdom about Nessies had been formed in the early-to-mid 1930s, with the mass media concluding that it was a "silly season" phenomenon. The powerful evidence that started to come in almost three decades later—Dinsdale film, sonar, underwater photos—has not sufficed to persuade official sources or the media to retract their long-held opinions and to admit to error and to misleading the public.

IMPLICATIONS FOR SCIENCE AND PUBLIC POLICY

It is not only with the Loch Ness Monster that a conclusion reached prematurely continues to dominate public discourse even as contradictory facts accumulate. The same psychological and sociological factors are in play in every human activity, including science. For example, the early-20th-century belief in the heritability of behavioral traits led to the forced sterilization of tens of thousands of Americans for many decades, as late as the 1980s (Lawrence, 2012; Reilly, 2015).

The critical point is that the specialist experts on any given topic are, like other human beings, predisposed to ignore or not to notice, and certainly to resist, evidence that seems incompatible with their acquired or established beliefs. It follows that advice to policymakers should come from individuals able to understand the technical issues but not themselves actively involved in the relevant research activity. Thus for advice on scientific matters, the best sources would be historians and sociologists and philosophers of science, or individuals in the relatively new discipline of Science and Technology Studies which incorporates history and sociology and philosophy of science as well as political and other aspects. The Presidential Science Advisor should be someone well-qualified in those areas rather than, as is now

the practice, an active scientist.

Furthermore, when there is much controversy over some scientific or medical issue, there is needed some publicly open and visible procedure for resolving the matter. Science, just as much as other human activities, is in need of fact-checking to ensure that its theories remain consonant with objective reality (Bauer, 2021). Since the experts most directly involved have strongly ingrained views that may not have been modified by accumulating contradictory evidence, modern society needs something like a Science Court (Bauer, 2017, chapter 12).

NOTES

- ¹ William of Ockham, ~1285-1350, philosopher, Franciscan friar.
- ² Personal communication from Mrs. Ross's son, whom we knew for many years though renting the chalet below his cottage on the south shore of Urquhart Bay.
- ³ Personal communication. MacKintosh was a highly respected Inverness lawyer; he and his wife became our good friends, but it was years before he told us of his personal encounter with a Nessie—a "huge gray mass" that surfaced not far from his fishing boat.
- ⁴ An iconic "multiple humps" that are actually a side view of wake formations; published in 1969 in a newspaper (*Sunday Express*) and reproduced in various tourist brochures, for instance in Owen (1980–1986).
- ⁵ <https://www.themanwhofilmednessie.com/tims-nessie-film.html>
- ⁶ Adrian Shine, "The Dinsdale Loch Ness Film. An Image Analysis." https://mega.nz/file/JX530AKC#FXp99K_F2lpVjy6Q3Ijh3ukb_0jnThXBaKS35r0Xq8w. Shine's analysis was critiqued in Henry Bauer, "To whom it may concern", https://mega.nz/file/LGIWSDCl#0W-8JA8obFfPDq1LuObT-GhtpU6CrDdljfcy_mv65yt0
- ⁷ One of their failed attempts is shown in *Lake Monsters*, a Discovery Channel documentary produced by the BBC (Bauer, 2002); see also <https://henryhbauer.homestead.com/DinsdaleFilm.html>

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APPENDIX: LOCH NESS MISPERCEPTIONS

First Hand Observations Between 1985 and 2004, During Several Annual Weeks at Loch Ness

At any ocean or large lake, there are many ways to be fooled into thinking that an animal is being seen even when no animal is actually there. At Loch Ness there are a great many things that can easily be mistaken for a Nessie.

When the water is a bit choppy, the shadows of waves can look—especially out of the corners of one's eyes—like solid objects knifing through the water, surfacing and quickly submerging again; seeming like some dark object(s) moving sideways to the direction in which the waves are rolling.

When the water is very choppy, the tops of the waves break into white foam and these white caps or “white horses” can make it seem that those black objects—which are really the shadows in the waves—are producing splashes.

When the water is calm, there are many ways to be fooled: When there is very little wind, the water can be like a black mirror, and little gusts of air touching the surface of the water can look very much like wakes, moving very rapidly or quite slowly. More commonly, most of the surface is slightly wind-ruffled and has a silvery sheen—except in patches of calm where it still looks black. Those patches can seem very much like black objects in the water, especially when one is close to water-level or at a distance; only from a high elevation (or through binoculars) can one see that the “object” is flat along the surface of the water and not poking up out of it. These patches of calm can stay unchanging for minutes at a time; or they can seem to move quickly; and they can change shape in many intriguing ways. Sometimes these calm patches last for a very long time, perhaps because there is an oily film on the water.

Things that seem to be skating over the water may be reflections of things moving on the other shore or flying above the water or above the hills. Roy Mackal was temporarily misled by some low-flying ducks that were invisible against the dark shore but whose reflections were easily seen, appearing to move rapidly on the water.

Reflections of shadows on trees on the opposite shore can look like black objects lying on the shore or in the water just a little off the shore.

Mirages can make boats look two or three times as high as they actually are. Mirage effects are greatest when the air is warm and when one is standing close to water-level. Looking up or down the length of the loch

shows stronger mirage-effects than looking across it. When the conditions favor mirages, a good place to observe them is from the spit of land between the Caledonian Canal and the River Oich, at Fort Augustus; or from a boat.

Birds

Birds can leave amazingly big wakes on glassy water. Often one cannot even see the bird itself (or birds: it may be a whole family, usually of ducks). Some of these birds can submerge, stay under for several minutes, and come up again so far away that one might miss the re-surfacing altogether. Almost every late summer evening one can see this in Urquhart Bay: a mother duck taking her youngsters out for training runs. Sometimes they leave a clear V-wake, and at water level and without binoculars one may not see the ducks themselves. Sometimes they suddenly submerge and reappear only after several minutes, often quite far away. Once I was stunned when a line of them suddenly appeared with a splash on the surface, momentarily making me think that a Nessie had surfaced with its neck lying along the water.

Tell-tale signs that wakes are from a flock of ducks are that occasionally the V-wake becomes irregular, as some of the little ducks move a bit faster than others and break ranks. Typically too, the wake does not proceed at a smooth pace but in "jumps", fast for a while and then slowing almost to halt, then speeding up again. A film Richard Raynor took in the 1960s, long thought to be of a Nessie, shows those tell-tale spurts, and Raynor himself realized years later that it had been a duck family; the mis-interpretation was almost inevitable since the camera had been at near water-height. Height above the water makes for much sounder photography as well as observation.

Boat Wakes

Boat wakes can persist for long times, half an hour or more, because the Loch is so wide. When it is very calm, a wake may even reflect off the shore and travel back again in the opposite direction. Very powerful wakes are generated by some of the Jacobite tourism boats that cruise from Inverness to Urquhart Castle at various times during the day and evening. A single wake-arm can look like a succession of humps; and as the wake *approaches*, it can look like humps moving *sideways*. The wavelets that form the wake do not all dissipate at the same rate. One part of a wake often keeps going long after the rest of it has died down, and then that remaining segment of wake can look very much like a single hump or like two or three humps—

and quite unlike a fresh boat wake.

Sometimes one of these waves can seem to stay in one place. If it is approaching and one's height above the water is not enough to recognize it as a wave, then the shadow at the side of the wave can look quite like something dark emerging out of the water, and the white splash at the front of the wave as it curls over can add to the illusion.

At about 11 o'clock one bright morning in 1983, I watched a black object surface and submerge three times, splashing every time, near the middle of Urquhart Bay. I shot some Super-8 film (with a 64 mm telephoto lens), and later looked at that film many times without being sure what I had filmed. But eventually, having watched the waters of Loch Ness a lot more, I finally realized that I had seen and photographed one of those bits of a past wake that is just like a single wave staying in one place and looking like a solid object bobbing up to the surface and down again. A tell-tale sign that something is a wave or a wake effect: ***if it repeats itself more or less regularly***, it is much more likely to be water action than an animal; that instance I had filmed repeated itself three times.

Bird Wakes as Well as Boat Wakes

Wakes can be very deceptive. When two wakes cross one another, the effect can look even more like a series of humps. Several published photos, and several videos shown on television, and which were described as possibly being Nessies, were definitely wakes.

SPLASHES, RIPPLES, RINGS...

Other disturbances in the water, too, can make one imagine that a big animal is splashing around when the real explanation is something else. Some time before Tim Dinsdale got his actual film of a Nessie, he thought he had filmed one closer to shore, only to realize when viewing the film that it was water eddying around rocks where a small river was flowing into the loch.

Rings of ripples form: from rising fish, or from bubbles of gas rising from the bottom, or from insect hatches. In calm water, the rings of ripples from ducks or fish rises can become quite impressively large.

Little fish quite often leap right out of the water, and occasionally quite large salmon do. When one has just seen a splash out of the corner of an eye, one cannot properly judge how large it was, let alone how large was whatever produced the splash. (One can watch salmon jumping at several places not far from Loch Ness. Near Beaulay, good salmon-viewing spots are below Kilmorack Dam and at the Falls of Rogie. Farther away, the Falls of

Shin near Lairg are a favorite spot to watch salmon leaping up waterfalls. South and east, at Pitlochry on the A9, there is a fish ladder with underwater viewing area.)

Reflections from the Water

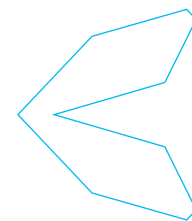
Reflections can be very misleading. In fact, most of what we “see” “on the water” is not actually there but is actually a reflection off the surface of the water, of something in the sky or on the opposite shore. Sometimes a light, or a little cloud, or quite a small object on the shore, can cast a very long reflection. One morning two of us saw a long vertical whitish object near the opposite shore, about a mile and a half away: We thought it was perhaps a sailboat or a windsurfer, but through binoculars it was revealed as the shiny cover (plastic?) of a dinghy (inflatable?) reflecting the sun.

Genuine Nessie sightings are likely to be subjectively convincing; many eyewitnesses reported their

amazement at the size of the monster, or at its power as it sweeps along. Of course, subjective conviction is not objective proof.

Maybe...

So there are many ways to be fooled into thinking one has seen a Nessie when one actually hasn't. But the opposite is also possible. We expect Nessies to be *big*: but even big animals don't always *look* big, depending how much of themselves they show. If Nessies breathe air, as most searchers believe, perhaps they could do so by poking just the tips of nostrils out of the water. Then what look like rings made by feeding fish could be from Nessies. Almost every summer evening, off the western shore and parts of the southern shore of Urquhart Bay, innumerable circular ripples appear. We naturally take them to be insect hatches or rising fish, but maybe some of them could be Nessies . . .



ESSAY

Controlled Experiments Involving Anomalous Information Reception with Mediums: An Analysis of the Methods Applied in Recent Studies

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HIGHLIGHTS

A targeted analysis of prior mediumship studies identified several procedures that coincide with positive results and might prove useful to advance research in this area.

ABSTRACT

The study of Anomalous Information Reception (AIR) with mediums, where an individual supposedly has access to data without the use of the basic senses, claiming to have received information from deceased personalities, has the potential to introduce new information about the relationship between mind and brain. Recent studies that investigated whether AIR occurs in mediumistic procedures have produced conflicting results. This article compares eight studies with greater rigor in the control over information leakage with regard to methods and results, with the aim of identifying the cause of the disparity in results. We found that there seems to be a higher probability of significant results for AIR when the study protocols select mediums with previous consistent evidence of AIR; select sitters who are strongly motivated for the study; supply the medium with some information about the deceased; allow him/her to speak freely but also ask objective questions; provide scores for both full readings and individual items; and avoid a large number of readings and items of information for evaluation. This diligence seemingly provides greater equilibrium between ecological validity and control over information leakage, favoring the occurrence and detection of AIR.

KEYWORDS

Anomalous information reception, mediumship, medium, mind-brain relationship, method, survival, protocol

INTRODUCTION

Anomalous experiences are those that are unusual or that deviate from the prevailing scientific paradigm, such as reports of telepathic, mystical, mediumistic, or out-of-body experiences (Cardeña et al., 2013). There are accounts of the occurrence of these experiences in all societies and epochs, (Bozzano, 1997; Shushan, 2009). One of the anomalous experiences is the so-called Anomalous Information Reception (AIR), which happens when the

person supposedly exhibits knowledge of information to which he/she would not have had access using the five basic senses or through inferential reasoning. Mediumistic experiences, where an individual referred to as a medium claims to have received information, perceived sensations, or felt himself/herself to be under the psychic or motor influence of a deceased personality (Alvarado, 2010; Bastos et al., 2015; Gauld, 1983; Moreira-Almeida, 2012), figure among those experiences where AIR has allegedly occurred.



Scientific investigations of mediumistic experiences have been conducted since the middle of the 19th century (Alvarado, 2012; Bastos et al., 2015; Kelly & Arcangel, 2011; Lamont, 2004; O’Keeffe & Wiseman, 2005; Pimentel, 2014). The practice went into decline a century later (Kelly, 2010) but resurfaced in the first decade of the current millennium (Daher et al., 2017).

In many cultures, a significant number of people believe in the genuineness of the mediumistic phenomenon. In the USA, for example, as much as 38% of the population believe in mediumistic communication (Newport & Strausberg, 2001), and in the UK up to 32% do (Ipsos Mori, 2007).

In addition to the influence that this belief exerts over millions of people, studies into mediumship can also be justified by the potential to introduce new information about the relationship between mind and brain, and by the influence that it may have on the mental health of grieving individuals or those experiencing anxiety in relation to their own mortality.

There are at least four main hypotheses regarding the alleged phenomenon of AIR in mediumship (Braude, 2003; Gauld, 1983; Moreira-Almeida, 2012).

The first hypothesis is fraud (Braude, 2003; Gauld, 1983; Moreira-Almeida, 2012). Information is supposedly obtained from data revealed by the sitter, directly to the medium, or published on social media. It could also be achieved using cold reading techniques where the medium succeeds in acquiring information by employing disguised questions. Another way to obtain information is to read body language, clothing, tattoos, or accessories. Also, with the hypothesis of fraud, there is a possibility of chance hits, particularly if the message only contains generic information.

A second hypothesis is dissociative identity (Braude, 2003; Gauld, 1983; Moreira-Almeida, 2012), where the unconscious of the medium, who is usually in a trance, personifies a deceased person, using information in his/her own memory, or when subliminal memories spring to the mind and are wrongly interpreted as coming from a deceased personality (also called cryptomnesia) (Dorsch, Häcker, & Stapf, 2001). In these cases, the person believes, in good faith, that he received a genuine mediumistic communication.

A third hypothesis to explain AIR would be Extra Sensory Perception (ESP), where the person allegedly obtains information using telepathy, through the mind of the sitter, or by clairvoyance, from documents or other sources at a distance (Braude, 2003; Gauld, 1983; Moreira-Almeida, 2012). This hypothesis is characteristic of anomalous reception, but not communication with a deceased personality.

The last hypothesis is actual communication with a

deceased personality (Braude, 2003; Gauld, 1983; Moreira-Almeida, 2012). This explanation implies that the mind and brain are sufficiently independent and that the former can continue to exist after the death of the latter. This hypothesis may also be considered a form of telepathy, the difference being that the source of the information captured by the medium would not be the mind of a living person (e.g., the grieving sitter), but rather would belong to the deceased loved one.

Mediumship has been studied using several complementary approaches. There have been studies into the mental health of mediums (Moreira-Almeida et al., 2007), the neurophysiology of the mediumistic trance (Mainieri et al., 2017), the psychological effect of the medium’s message upon the grieving person (Hott & Reinaldo, 2020), and the occurrence of AIR in alleged mediumistic communications (Beischel & Schwartz, 2007; Beischel et al., 2015; Freire et al., 2022; Jensen & Cardeña, 2009; Kelly & Arcangel, 2011; O’Keeffe & Wiseman, 2005; Rock et al., 2014; Tressoldi et al., 2022).

Recent studies into the occurrence of AIR have produced divergent results, even when applying rigorous methods to control information leakage. A recent meta-analysis found positive results indicative of AIR (Sarraf et al., 2021), while another, employing a smaller number of studies, found negative results (Rock et al., 2021). This points to the need for an analysis of the differences between the various protocols employed in a quest to explain the discrepancies and help to move the field forward.

A major challenge of research into AIR in mediumship is the need for volunteers with this supposed, high-level ability, who are capable of carrying out mediumship activities under the restrictions imposed by the experiment’s control protocols. It is often claimed that mediumistic communication depends on a delicate balance, only materializing under favorable conditions (Kardec, 2010; Stevenson, 1977), which vary according to the culture (Alvarado, 2010) and the medium. Among other conditions, some mediums claim they can only establish a connection if they are situated in a favorable environment and a scenario compatible with their beliefs, while others claim they need some information to be able to summon the deceased (Beischel, 2007).

Regardless of whether these requests are necessary or imaginary, irrespective of the nature of the study, it is always necessary to seek equilibrium between the conditions that the participant believes in, thereby affording ecological validity to the experiment (Belzen & Hood, 2010), and the required control over the experience. As an example, Delorme et al. (2020) suggest that mediums were more anxious than non-medium participants (control group) in

a mediumistic experiment, possibly because they felt they were being put under the spotlight.

This article aims to analyze the methods employed and the results achieved using the most rigorous recent studies investigating AIR in mediumship, seeking explanations for the disparity of results. Based on the hypothesis that a balance is required between ecological validity and control over information leakage, we analyzed those aspects of the methodology that are more related to the interface between medium and sitter. Based on this analysis, we propose methodological aspects that would appear to produce more effective protocols for investigating AIR in mediumship.

METHOD

A bibliographic search was carried out on Web of Science, PubMed, and Scopus databases. For the Web of Science database, filters were used to limit the search to the fields of Psychiatry, Religion, Integrative Complementary Medicine, Psychology, Clinical Neurology, Neurosciences, Psychology Experimental, Psychology Multidisciplinary, Psychology Clinical, and Medicine Research Experimental. For Scopus, the search fields were Medicine, Psychology, Multidisciplinary, Health Professions, and Neuroscience. The keywords used were “mediumship,” “mediumistic,” and “after-death communication.” The inclusion criteria were articles published in English, dealing with quantitative investigation into the accuracy of mediumistic information, employing at least triple-blind protocols, and published between January 1, 2000, and September 1, 2022.

The triple-blind protocol means that: I) the mediums are blind to the identities of the sitter and the deceased; II) the researcher interacting with the mediums is blind to the identities of the sitter and the deceased; and III) the sitters blindly scoring the accuracy of the messages are masked to the identity of the medium and to which message is the one directed towards him/her, and those which were inserted as a control (Bastos, 2015).

Five methodological characteristics of the selected studies were analyzed:

(1) Selection of mediums – protocols employed for the selection of mediums for the experiment.

(2) Selection of sitters – protocols employed for the selection of sitters.

(3) Sample size – number of mediums, sitters, and readings performed in the experiment.

(4) Reading control – protocols employed in the information production phase, the stage with the biggest impact on the medium. The following aspects were considered: type of interaction established with the medium; information disclosed; information requested;

and if the medium was permitted to choose which deceased personality he would attempt to make contact with.

(5) Reading evaluation – protocols employed in the information evaluation phase, the stage with the biggest impact on the sitter. The type of data sent for evaluation and the quantity thereof were taken into consideration.

These five characteristics were selected because they relate to the interface between medium and sitter, which is the focus of our hypothesis.

RESULTS

The search of the Web of Science database produced 120 articles, while Pubmed produced 15 and Scopus 149, totaling 284 studies. Of these, 268 were discarded as they did not satisfy the inclusion criteria and eight were rejected as they were duplicates. The eight studies that satisfied the inclusion criteria are presented below, in chronological order, with a summary of the methods and results found. The key points in each method are exhibited in Chart 1, for the purposes of comparison.

Study A

This study was conducted in England by O’Keeffe and Wiseman (2005), with 5 mediums and 5 sitters.

The experiment was conducted with the medium and sitters in separate rooms. For one hour, the medium sought contact with one or more deceased personalities related to the sitter, freely manifesting what he felt or perceived about the deceased. During the attempts by the medium, the sitter would listen to his/her music of choice. At the end of the allotted time, this sitter made way for the next one and the process was repeated.

The readings were transcribed and separated into phrases or items of information, and the sitters independently evaluated all the statements produced by all the mediums for all the sitters. At the end, an overall score for each reading was arrived at by summing up the individual classifications attributed to each statement comprising the reading. Each sitter evaluated 1,169 items of information, assigning marks for the accuracy of each piece of information.

As a result, the scores given by each sitter to their reading were no higher than those assigned by the other four sitters (p value of all mediums combined was 0.63).

Study B

A study conducted by Beischel and Schwartz (2007) in the USA, involving eight mediums and eight sitters.

This study employed a “proxy sitter” protocol whereby one of the researchers, blinded to the real sitter, but

TABLE 1. Summary of the Key Points of the Protocols and Results

Sample	Medium selection criteria	Sitter selection criteria	Protocols for reading stage	Protocols for evaluation stage	Result
A 5 mediums 5 sitters 25 readings	Certificates issued by the Spiritualists' National Union in the UK; it is unclear if they have already produced data indicative of AIR.	Homogeneous in terms of sex and age. Apparently, it was not evaluated if there might be impactful, emotional losses and if they were motivated for the experiment.	Interaction No interaction. Sitter and researchers in rooms next to the medium's room. Information disclosed No information supplied. Information requested Permitted to speak freely Selection of deceased The mediums could attempt to contact any of the deceased related to the sitter, but it had to be a communication from deceased personalities for all the sitters.	Item received Items separated out. Quantity All items from 25 readings, amounting to over one thousand items.	Not significant
B 8 mediums 8 sitters 16 readings	Previously demonstrated ability to produce accurate information	Believed in after-life and mediums and had a very close deceased personality.	Interaction Remote interaction with proxy, by telephone. Information disclosed Forename of deceased Information requested 4 objective questions and allowed to speak freely. Selection of deceased Unable to choose.	Item received Full readings. Quantity Two readings - theirs and a control.	Significant
C 1 medium 7 sitters 7 readings	Selected based on reputation; it is unclear if he had already produced data indicative of AIR.	All had lost at least two significant persons, but only three had lost at least one close person.	Interaction No interaction. Researcher in room to the side, sitter at distance. Information disclosed Name of sitter Information requested Allowed to speak freely. Selection of deceased The medium could attempt to contact any of the deceased related to the sitter, but it had to be a communication from deceased personalities for all the sitters.	Item received Full reading and items separated out. Quantity Seven readings, average of 30 statements per reading.	Not significant
D D-I 4 mediums 12 sitters 12 readings D-II 9 mediums 40 sitters 40 readings	Not described, it is unclear if they had already produced data indicative of AIR.	Motivated, with significant losses	Interaction Remote interaction with proxy sitter, by telephone. Information disclosed D-I: Name of sitter and day/month of birth. D-II: Neutral photograph of the deceased. Information requested Allowed to speak freely Selection of deceased They could not choose	Item received D-I: Full reading and items separated out. D-II: Full reading. Quantity D-I: Four full readings and items of information separated out; number of items not provided. D-II: Six full readings.	D-I Not significant D-II Significant

representing him/her, interacted with the medium. The proxy sitter interacted with the mediums by telephone, stated the deceased's forename, and asked if the medium had information about the deceased. He then asked specific questions about the deceased (cause of death, hobbies, description of the deceased's appearance and personality) and if he/she had any specific message for the sitter. Each sitter performed a blind scoring of the intended and control readings, in four modes: They scored each item for accuracy and emotional significance; scored the

reading as a whole, and also had to choose which letter he/she thought was directed to him/her.

The result was that the average summary rating for the intended readings (mean = 3.56) was significantly higher ($p = 0.007$) than for the control readings (mean = 1.94). Sitters chose the intended reading 81% of the time ($p = 0.01$).

Study C

This study was conducted in Sweden by Jensen and

Sample	Medium selection criteria	Sitter selection criteria	Protocols for reading stage	Protocols for evaluation stage	Result
E 19 mediums 38 sitters 38 readings	Mediums were selected and trained using a certification procedure	Consultants were selected based on an online pre-screening questionnaire	Interaction Interaction with proxy sitter remotely via telephone. Information disclosed Forename of deceased Information requested Objective questions and allowed to speak freely. Selection of deceased Unable to choose.	Item received Full reading and items separated out. Quantity Two readings.	Significant
F F-I 14 mediums 28 sitters 28 readings F-II 20 mediums 40 sitters 40 readings	The mediums previously demonstrated their ability to produce accurate information	Randomly chosen from a large list of volunteer sitters who "reported wanting to hear from one specific discarnate".	Interaction Interaction with proxy sitter F-I: Remotely via telephone. F-II: Part of the readings performed in person. Information disclosed Forename of deceased Information requested Objective questions and allowed to speak freely. Selection of deceased Unable to choose.	Item received Full reading and items separated out. Quantity Two readings.	F-I: Significant F-II: Significant
G 8 mediums 94 sitters 78 letters 64 readings	Five mediums produced evidence of previous production indicative of AIR, and only one had experience in the production of letters from a deceased to grieving relatives.	"mourning an adult relative/ friend who had a strong emotional bond"	Interaction With proxy in person and sitter at distance. Information disclosed Forenames of sitter, deceased and photograph of the deceased. Information requested Allowed to speak freely Selection of deceased Able to choose.	Item received Full reading and/or letter, and items separated out. Quantity Six full readings/letters and items separated out. Number of items not provided.	Not significant
H 9 mediums 36 sitters 38 readings	it is unclear if they had already produced data indicative of AIR.	"Serious interest in having a reading related to a deceased relative or friend,"	Interaction Remote interaction with researcher, via app. Information disclosed Forename of deceased Information requested Questions and allowed to speak freely. Selection of deceased Unable to choose.	Item received Full Reading and items separated out. Quantity Two full readings and their items of information.	Significant

Cardeña (2009), with one medium and seven sitters. The medium received envelopes containing the names of the sitters and sought to receive information from potentially deceased personalities related to that sitter, during a reading lasting 15 minutes, with both video and audio being recorded, and no interaction with the researchers, not even to receive specific questions. For each reading performed, the medium produced a self-assessment in terms of her level of confidence therein. Of the seven readings, five were described as "unconfident" and two were considered "somewhat unconfident." Each sitter scored all seven readings and individual statements (the ones addressed to himself/herself and others) in terms of their applicability to their personal history and current life situation.

Neither the overall reading scores (z-score of -1.2, p = .89) nor the average score for each statement (z = -1.3, p = .90) were better than would be expected by chance.

Study D

In the study carried out in the USA by Kelly and Arcangel (2011), two investigations were conducted. In the first investigation (D1), four mediums and 12 sitters were involved. The second investigation (D2) comprised nine mediums and 40 sitters.

The mediums performed readings by telephone, interacting with researchers assuming the role of proxy sitters. In D1, the mediums received the sitters' forenames and birth dates (but not the year), while in investigation D2 they only received a "neutral" photograph of the deceased.



In D1, the sitters received a blind transcript of their own reading and three readings intended for someone else, chosen at random, as well as the lists of individual statements extracted from these messages. Sitters rated the accuracy of each statement and then picked out what they thought was their own reading from the group of four. In D2, they received a group of six readings (the intended reading plus five control readings, paired by gender and age) and had to blindly rate each one.

The results of D1 were not significant: Only two of the 12 sitters correctly chose their own reading, which falls into the realms of chance. D2 did produce significant results: Of the 38 readings, 14 were correctly selected as first-choice and seven as second-choice; 30 readings were ranked in the top half (z score -3.89 , $p < 0.0001$).

Study E

This study was conducted in the USA by Rock et al. (2014), with 19 mediums and 38 sitters.

The reading took place via a telephone call, in which the mediums interacted with proxy sitters. Each medium performed two readings, one for each of the two pairs of deceased. Mediums initially answered objective questions (such as cause of death, physical features, personality, hobbies) and then proceeded to open discourse. The sitters received two readings (the intended one and the paired control) and had to evaluate them in two modes: overall score and the selection of which reading they believed to be theirs. The success rate of sitters selecting the correct letter was better than what might be expected by chance, 68.42% (z score = 2.12, $p = .02$).

Study F

In the study conducted in the USA by Beischel et al. (2015), two controlled investigations were carried out. In F1 there were 14 mediums and 28 sitters, while in F2 there were 20 mediums and 40 sitters.

In F1, the reading took place via a telephone call, where the medium interacted with a proxy sitter. The procedures were similar to those used in Rock et al. (2014): Each medium performed two readings, one for each of the two pairs of deceased, answering objective questions (cause of death, physical features, personality, hobbies) followed by open discourse. F2 repeated the protocol but with two changes: 12 readings were performed with the blinded proxy sitter physically present, and additional items were included in the objective questions (such as the description of the deceased's hair, eyes, physical condition, height, profession, favorite foods, etc.).

In both investigations, the sitters received two

readings (the intended one and the paired control) and had to evaluate them in three modes: individual scores of each item of information, overall score, and the selection of which reading they believed to be theirs.

Average overall scores of the target readings were higher than for the decoy readings, both in the 27 readings in F1 (2.78 ± 0.26 vs. 2.04 ± 0.26 , $p = 0.04$) and 31 readings in F2 (2.97 ± 0.26 vs. 2.13 ± 0.26 , $p = 0.007$). Seventeen target readings (63%) were correctly chosen in F1 ($p = 0.12$) and 21 (67.7%) in F2 ($p = 0.04$).

Study G

This study was conducted in Brazil by Freire et al. (2022). Unlike the studies described above, in this study the medium was allowed to perform readings (in which he verbalizes information supposedly transmitted by the deceased) and/or write letters (allegedly transmitted by the deceased), a process known as psychography which is common among mediums in Brazil. Eight mediums and 94 sitters participated.

Initially, four mediums were invited who had broad experience of writing mediumistic letters with non-controlled evidence of AIR. However, all of them refused to take part, three of them claiming that the conditions of the experiment diverged significantly from their own practices, mainly due to the lack of interaction with sitters. Subsequently, researchers selected eight other experienced mediums, though less experienced in terms of the production of mediumistic letters.

The mediums interacted with a proxy sitter, who supplied the sitter's forename, a photograph, and the forename of the deceased from whom a message was expected. The mediums were able to choose which deceased individual to attempt to make contact with. In total, 78 letters and 64 readings were generated, which were transcribed into separate items of information.

The sitters received a set of six readings/letters, the one addressed to them and five controls. They scored individual items of information as well as the full reading/letter.

There were no statistically significant differences between the global evaluation scores and the target and control readings (0.92 ± 0.76 SD and 0.75 ± 0.53 SD; z score 1.198, $p = 0.23$) and letters (0.54 ± 0.98 SD and 0.48 ± 0.47 SD; z score 0.429, $p = 0.67$).

Study H

This study was conducted in Italy by Tressoldi et al. (2022) with nine mediums and 36 sitters. The mediums performed readings remotely, via a conference call using

Skype or WhatsApp, interacting with the researcher in the role of proxy sitter. The medium was provided with just the forename of the deceased and was asked to provide a physical description and produce other information related to the deceased, as well as if there was a message for the sitter.

Each sitter received his/her reading and a control reading, paired for gender and produced by the same medium. Sitters had to blindly score the readings, both in terms of the overall reading and individual items.

Sitters selected the intended reading 65.8% of the time ($p = 0.036$). The average overall score (range: 0–6) for target readings was higher than for the controls (3.36 ± 1.47 vs 1.77 ± 1.3 ; $p = 0.001$).

DISCUSSION

The eight studies highlighted in this article followed similar recommendations for the control of information leakage, but arrived at different results (five obtained significant results while three did not). Sometimes, divergent results occur between two studies using similar protocols due to minor alterations to the method. Below, a number of considerations will be formulated to seek a better understanding of the divergent aspects.

Medium Selection Process

A number of authors have argued that the selection of mediums is one of the steps in the method that has most influence on the outcome (Freire et al., 2022; Kelly, 2010; Kelly & Arcangel, 2011) and that it would be more appropriate to choose the most proficient mediums, those who have already produced evidence indicative of AIR (Moreira-Almeida, 2012). The selection of participants with special abilities appears important, not only in mediumistic studies but also in many other areas, including ESP and other anomalous experiences (Cardeña et al., 2013). The results of the studies analyzed in this article corroborate this viewpoint.

Of the three studies that did not find any results indicative of AIR, in two the selection did not appear to have demanded proof of previous production of messages indicative of AIR (Jensen & Cardeña, 2009; O’Keeffe & Wiseman, 2005), while in the third study only five of the eight mediums achieved production suggestive of AIR, and, of these, only one had produced messages for grieving relatives on a regular basis (Freire et al., 2022). As for the five studies that produced results indicative of AIR, in three of them one of the selection criteria was to have demonstrated evidence of prior AIR production (Beischel & Schwartz, 2007; Beischel et al., 2015; Rock et al., 2014).

In the other two, it is unclear if this criterion was applied. In both, however, a larger number of mediums was used, which may have increased the chances of finding a medium with a superior ability to produce AIR (Kelly & Arcangel, 2011; Tressoldi et al., 2022). In the study conducted by Kelly and Arcangel, for example, in the first investigation, with the participation of four mediums, one achieved a hit rate of 100%; in the second investigation, involving nine participating mediums, one obtained a hit rate of 100%.

Sitter Selection Process

Mediums claim that deceased personalities are mentally summoned by their living, loved ones (Kardec, 2010). For them, it would be important to choose sitters who are deeply committed to the experiment (Beischel, 2007) and report a deep emotional need for contact with the deceased. In a recent study of 142 bereaved sitters, 21 received a mediumistic letter from their loved ones. The severity of the grief was the only feature that set apart sitters who received mediumistic communication from those who did not. The more severe the grief, the higher the chances of receiving some communication (Gomide et al., 2021). Of the studies analyzed in this survey, only one stated that it did not use sitter selection criteria which included impactful, affective losses (O’Keeffe & Wiseman, 2005), and was one which did not find a result indicative of AIR. In another study with negative findings (Jensen & Cardeña, 2009), all seven sitters had lost a “significant person,” but only three of them “had lost at least one close person” (p.63).

Reading Controls

This is the most delicate stage of the method from the medium’s point of view on account of the supposition that he requires minimum conditions in which to operate his mediumship (Beischel, 2007; Kardec, 2010; Stevenson, 1977).

As for any interaction that the medium may have had, in two studies the medium did not interact with anyone, and in both of these the results were negative for AIR (Jensen & Cardeña, 2009; O’Keeffe & Wiseman, 2005). In the other six studies, the medium interacted with researchers who took on the roles of “proxy sitters.” This outcome corroborates research concluding that mediums tend to obtain better results when interacting with individuals who play the role of sitters (Rock et al., 2021).

The “proxy sitter” protocol, proposed in the 1930s and subsequently employed by the majority of researchers, has twin aims: to prevent fraud through cold reading or a reading of body language, and to reduce the possibility

of telepathy (Beischel, 2007; Kelly, 2010), making the hypothesis of contact with the deceased more likely if AIR is detected. Some authors understand that this method would also have the advantage of being similar to the procedures normally employed by mediums in some cultures, the USA for instance, where the mediums often operate via telephone (Beischel, 2007). However, the proxy sitter protocol is still seen as limiting by many mediums, who believe it is necessary for a deceased's close relative/friend to be present in order to summon the deceased (Freire et al., 2022; Kelly & Arcangel, 2011).

In this article, we chose to analyze studies that were, at minimum, triple-blind, and found that, even with this level of control, it is possible to obtain positive results for AIR if a minimum of ecological validity is provided. Other studies suggest that it is not necessary to employ blinding protocols to control information leakage (Gomide et al., 2021). There are also studies that indicate that there was no significant difference between experiments in which the assistant was blind to the medium, and vice versa, and those in which neither was blinded (Rock et al., 2021).

Although some researchers understand that physical proximity between them is important (Stevenson, 1977), the studies with the best hit rates, of the eight analyzed, were conducted remotely, sometimes hundreds of miles apart, using telephone calls or conference call apps as the means of contact (Beischel & Schwartz, 2007; Beischel et al., 2015; Rock et al., 2014; Tressoldi et al., 2022). On the other hand, in those studies where the sitter was located in a side room, the findings were negative for AIR (Jensen & Cardeña, 2019; O'Keeffe & Wiseman, 2005).

As for the information disclosed, mediums frequently claim that they need a minimum amount of information to establish a mental connection with the right personality in a universe of billions of deceased (Beischel, 2007), a necessity corroborated by William James in his studies with mediums (Murphy & Ballou, 1973). The results obtained from the studies analyzed seem to confirm this understanding. In the study conducted by O'Keeffe and Wiseman, where mediums were not provided with any information about the sitter or the deceased, the hit rate came within the margins expected by chance alone. In the other seven, a minimum of information was supplied, and of these five found results indicative of AIR. Regarding which information to disclose to the medium, in four of the five studies that obtained positive results, the item of data revealed was the name of the deceased, and in one, his photograph.

With regard to which information should be requested from the medium, some studies asked him to freely manifest his observations, while in other studies, in addition to being able to speak freely, the medium had to

answer predefined questions. Beischel argues for the use of questions to help the mediums focus their attention and increase the probability that they will produce specific information. Moreover, in the view of the author, the use of questions makes the evaluation between the target reading and control reading more precise, because both will reveal the same kind of information (Beischel, 2007). Of the five studies that obtained results indicative of AIR, in four the medium received specific questions in addition to the opportunity to speak freely (Beischel & Schwartz, 2007; Beischel et al., 2015; Rock et al., 2014; Tressoldi et al., 2022).

Regarding the selection of the deceased, it was believed that another way to increase the protocol's ecological validity is to allow the medium to choose the deceased with whom he will attempt to make contact, from a selection presented by the researcher. Among mediums, it is commonly understood that the important part of the communication is that of the deceased, who needs to be willing and able to make contact (Beischel, 2007; Kardec, 2010). The results of this comparative evaluation, however, do not enable us to confirm this hypothesis. Of the five studies where results indicative of AIR were found, in four it was to be expected that the medium might produce information for all the sitters referred to him, and just one (Kelly & Arcangel, 2011) permitted the choice from a preselected group.

Reading Evaluation

Many mediums state that they receive information from deceased personalities in fragmented and often symbolic form (Alvarado, 2010), which could lead to a combination of data purportedly obtained from the mind of the deceased, the mind of the sitter, and the medium's own unconscious (Moreira-Almeida, 2012). As a result, one single mediumistic message may often contain both correct and incorrect items of information, and both generic and specific information. All of this, added to the emotional state of the often-grieving sitter, can render the message evaluation process somewhat challenging.

The component which the sitter received for evaluation varied between studies. In some, they would receive separate items of information, while in others they would receive full readings, or even both. For Kelly and Arcangel (2011), receiving a full letter might simplify the process of evaluation, because the items are often interrelated, and severing this linkage of ideas may lead to a partial loss of meaning. This hypothesis appears to be confirmed; the sitters evaluated full readings in the five studies that obtained positive results for AIR.

A large number of items given to the sitters for

evaluation could provoke fatigue or confusion. In the three studies with no results indicative of AIR, the sitters had to evaluate a large number of items. In one of these (O’Keeffe & Wiseman, 2005), there were more than a thousand dissected items of information, and in another there were seven full readings in addition to dozens of individual items (Jensen & Cardeña, 2009). In the last study, there were six full readings in addition to the individual items (Freire et al., 2022). Meanwhile, of the five studies that obtained results indicative of AIR, in four the sitter had to perform an evaluation of just two full readings and the items of information (Beischel & Schwartz, 2007; Beischel et al., 2015; Rock et al., 2014; Tressoldi et al., 2022) or six full readings, without separating out individual items of information (Kelly & Arcangel, 2011).

Implications and Applications

The analysis of the above-mentioned methodological aspects is of great value when devising methods to study AIR in mediumship, expanding the possibility of obtaining suitable results, combining ecological validity with a rigorous approach to data leakage. The investigation into AIR in mediumship (whether through ESP or survival of consciousness) has huge implications for the understanding of the human mind and the possibility of its function and/or existence beyond the brain.

CONCLUSION

The analysis of controlled studies into AIR in mediums shows that there are certain methodological characteristics that appear to be more associated with positive results for AIR. These conditions seem to be:

- selecting mediums with previous, consistent evidence of AIR and who feel comfortable working under the conditions established by the protocol;
- selecting sitters who are strongly motivated for the study and are grieving for a significant person;
- having some interaction with the medium, even as a proxy sitter in a home call;
- supplying the medium with some information about the deceased;
- asking objective questions but also allowing the medium to speak freely;
- providing scores for both the full reading and individual items;
- avoiding a large number of readings and items of information to evaluate.

One possible interpretation of these results is that these protocols provide better equilibrium between control over information leakage and respect for the culture and

idiosyncrasies of the medium, conferring ecological validity to the experiment.

In addition to increasing the ecological validity of quantitative research, several other approaches could be promoted. For example, in-depth qualitative investigation, as proposed by Gomide et al. (2021). The use of different methodological approaches in parallel may be complementary and synergistic in mediumistic research.

For future studies, in addition to opting for the above-mentioned protocols, we recommend consulting mediums in the locality about the minimum conditions that they feel are necessary to execute their mediumship and, based on these conditions, build protocols to control data leakage. In other words, not simply to subject the medium to the method but also, as far as is possible, to adapt the method to the medium (Gomide et al., 2021). Considering that mediumship is a complex human experience influenced by a wide range of factors (cultural, biological, social, psychological, etc.), it is unlikely that, regarding the methodology, “one size fits all.”

This article, the aim of which was to make an initial attempt at identifying trends, had a number of limitations. The first was the small number of studies evaluated, as a result of the limited number of recent, controlled studies. Another limitation that hampered comparison was that some of the studies analyzed failed to make clear a number of important variables, such as the criteria for considering the proficiency of the medium and the motivation of the sitter. Thus, our results should be analyzed with caution, with the heuristic proposition of enhancing future studies. Moreover, other aspects of the studies still have to be investigated, such as the statistical methods adopted.

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AUTHOR’S CONTRIBUTIONS

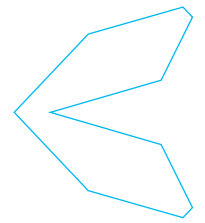
The first-named author worked on the conceptualization, methodology, formal analysis, investigation and composition of the original draft. The second-named author worked on the formal analysis, resources, composition (review and editing), supervision, project administration.

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ESSAY

Clarifying Muddied Waters, Part 2: What the Sudduth-Tucker Debate About James Leininger Suggests For Reincarnation Research

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HIGHLIGHTS

Themes raised during recent debates of a highly controversial case of reported reincarnation offer constructive insights for setting research standards to improve new studies.

ABSTRACT

Part 1 of this invited paper presented a secure timeline for the James Leininger reincarnation case, showing Michael Sudduth's criticisms of it to be unfounded. Part 2 begins with an analysis of the exchange in this journal between Sudduth and Jim Tucker over Tucker's investigation, then recommends improvements that might be made in the investigation and reporting of reincarnation cases to address criticisms, overcome a will to disbelieve in the evidence, and reach scientists and scholars open to following the research findings where they lead. Proposals are grouped under three headings: Case Study Methodology, Reporting Standards, and Statistical Analysis.

KEYWORDS

Criticism of reincarnation research; reincarnation research methodology

INTRODUCTION

In inviting me to join the debate between Michael Sudduth (2021c, 2022b) and Jim Tucker (2022) over the James Leininger reincarnation case, James Houran wrote:

I wondered whether you might be willing to prepare a commentary that would follow their exchange in which you assess the valid points from each author and then propose a standardized research protocol to help guide future case

studies on reincarnation. Or, at least outline what you think are the key variables that must be considered when striving to "solve" these cases in a way that controls for confirmation bias, etc.

I accepted because I thought it would be helpful to provide an independent appraisal of the Leininger case and of the exchange between Sudduth and Tucker, but even more because of the opportunity to consider what might be improved in investigating and reporting reincarnation cases. In Part 1 of this paper (Matlock, 2022b), I



presented a secure timeline for the case, backed by supporting documents sent to the Psi Open Source repository. That secure timeline undermined Sudduth's main assertions, and I came down decisively on Tucker's side of the debate. In Part 2, I analyze rhetorical aspects of the Sudduth–Tucker exchange and present recommendations for improvements in reincarnation case study methodology and reporting.

SUDDUTH VERSUS TUCKER

The apparently successful verification of James Leininger's past-life memory claims was first described in *Soul Survivor*, a book directed to the general reader by his parents with the assistance of a professional writer (Leininger et al., 2009). Jim Tucker was able to begin his investigation only after the publication of *Soul Survivor*, but he has since written about the case on three occasions (Mills & Tucker, 2015; Tucker, 2013, 2016). Tucker's 2016 contribution was an article in the journal *Explore*, where he focused on James's memory claims and associated behaviors mentioned in an unaired pilot for a proposed television series entitled *Strange Mysteries*. The *Strange Mysteries* segment was taped before the person to whom James referred was identified and constitutes "early-bird" documentation of his past-life-related statements and behaviors.¹

Early-bird cases are prized because the subject's memory claims and witness testimony are uncontaminated by knowledge acquired after the previous life has been identified. The Leininger case is widely regarded as one of the evidentially strongest American reincarnation cases, but that is not how Sudduth perceives it. For Sudduth, the case has numerous problematical aspects to which he has drawn attention in blog posts (2021a, 2021b, 2022a) and a paper published in this journal (2021c). Tucker (2022) replied to Sudduth's paper, followed by a response from him (Sudduth, 2022b). The journal issue with their exchange also included Part 1 of the present paper (Matlock, 2022b). I begin Part 2 with a consideration of Sudduth's (2022b) response to Tucker (2022).

Structure and Cogency of the Arguments

Tucker (2022) concentrates on the validation of James's memory claims and concludes that "much of Sudduth's (2021c) paper is ultimately beside the point" (p. 89). Sudduth (2022b), in turn, opens his response by arguing that Tucker's reply is mostly beside the point. "Tucker's response is largely focused on defensive posturing and cherry-picking claims . . . and trying to show that my depiction of the James Leininger case involves

various 'distortions, mischaracterizations, and outright misinformation' (p. 84)." Sudduth concedes, "This could be instructive and effective as a critique," adding, "but only if Tucker showed how his purported corrections and narrative amendments were consequential to the cogency of my arguments" (2022b, p. 91). He elaborates:

[Tucker] doesn't say much, if anything, about my *arguments*—for example, what specific conclusion I draw from the facts I present, and how that conclusion feeds into a wider argument. On occasion, he tries to address what he thinks I'm arguing, but his objections betray various confusions about the content and structure of my argument—for example, not understanding how cumulative case arguments work or how to distinguish claims essential to an argument from those that are of minor significance or tangential. Tucker's response may be a passionate exercise in apologetics, but it does little to address the cogency of my arguments. (Sudduth, 2022b, p. 91; his italics)

It appears that Sudduth, a philosopher, and Tucker, a child psychiatrist, have different expectations regarding academic discourse. Tucker's (2022) thesis is simple. He emphasizes what he understands to be the crux of the matter, the question of whether James Leininger's account of what befell James Huston, Jr., matches what happened to James Huston, Jr. Sudduth (2021c), on the other hand, raises questions not only about the basis on which James Leininger's statements can be confirmed as applying to James Huston, Jr., but about what James Leininger said, and when, because he does not trust James's parents as witnesses. Sudduth hints that the problems he sees with this case plague reincarnation research generally.

There is nothing wrong in principle with Sudduth's approach; reincarnation research certainly can benefit from a hard look at problems of this kind. However, to be appreciated, skeptical scrutiny should meet the same standards as the work it critiques. There should be feedback between surmises and facts in evidence, and unsupported surmises should be surrendered or, at least, tempered. If the facts point in directions other than an a priori assumed one, the proper way forward is to accept the evidence and move on to the next issue, not to continue levying allegations which have been proven wanting. Unfortunately, the latter tack is pursued by Sudduth (2022b) in his response to Tucker. He summarizes the "main threads" of his paper (Sudduth, 2021c) thus:

(i) "The Leiningers are not reliable as informants"

(Sudduth, 2022b, p. 92).

Tucker acknowledges the inconsistencies in the Leiningers' account that so trouble Sudduth, then voices what for him is an overriding consideration: "[Y]es, in telling their story over the years, Bruce and Andrea Leininger may have been inconsistent at times on some of the details. *That's why we go by the documentation*" (2022, p. 89; his italics). Sudduth's response (2022b, pp. 97–98) is to list inconsistencies in the Leiningers' testimony as if Tucker has not acknowledged them. Sudduth (2022b, pp. 98–99) questions the significance of date stamps on internet downloads to which Tucker draws attention, preferring to follow a dubious timeline advanced at one stage by Bruce Leininger, whose testimony he otherwise deems unreliable.

(II) James was exposed to specific ordinary sources of information that (a) raise the probability of non-reincarnation explanations of the presumed facts in the case and which, therefore, (b) lower the probability of the reincarnation hypothesis relative to those same facts.

(III) Tucker's investigation was blind to several important ordinary sources of information to which James was exposed proximate in time to important claims and behaviors his parents attributed to him (Sudduth, 2022b, p. 92).

Tucker (2022, pp. 88–89) does not dispute that James was exposed to ordinary sources of information, but he questions Sudduth's timeline and underscores what for him is the crucial issue: Nothing in the ordinary sources of information to which James was exposed would have supplied him with details about Huston's life and death, which he began to relate when he was barely two years old. Sudduth never addresses this issue directly. He insists on crediting an inference by Andrea Leininger that Huston drowned in his sinking plane (2022b, p. 98), even though Tucker (2022, p. 88) reminds him that nowhere is James himself reported to have said this.

Both Sudduth (2021c) and Tucker (2022) employ cumulative argumentation. Sudduth builds his case by approaching his central argument from different angles; Tucker responds by showing that on point after point Sudduth's allegations fail when confronted with facts.

Epistemological Issues

Sudduth is much concerned with what constitutes evidence in support of past-life memory claims. He says:

Tucker's entire critique depends on a variety of unstated assumptions about how we should understand *evidence*. When is one statement evidence for another statement? When would it be good evidence? Ultimately, my paper was designed to drive the reincarnation train into a collision course with these crucial questions in epistemology. Tucker failed to see this, or he chose to ignore it. (Sudduth, 2022b, p. 91; his italics)

What makes any fact evidence for the truth of a claim? If we're not clear about the answer to this question, we can't be clear about why the presumed facts of the JL case—for example, what Tucker presents in his tables—are evidence for reincarnation, much less why they would be good evidence. And if we're not clear about this, we're not going to be clear about why anything I've said undercuts the JL case as evidence for reincarnation." (Sudduth, 2022b, p. 92; his italics)

For Tucker, as for reincarnation researchers generally, evidence in relation to past-life memory claims is constituted of facts which show the memory claims to be accurate, inaccurate, or somewhere in between. Reincarnation researchers further distinguish between verified memory claims that are general, applicable to many people, and those that are specific, applicable to few people or to a single person. The latter have greater value than the former and the more of them there are, the more confident researchers can be that purported memories are indeed memories of the life of a given deceased person. After searching for ordinary sources for the memories, researchers consider non-ordinary sources (e.g., spirit possession, living agent psi). When all ordinary and non-ordinary sources have been found wanting, reincarnation stands as the default explanation.

James signed drawings of naval battles "James 3." He said that he died when the plane he flew off a boat called *Natoma* was struck in the nose, caught fire, and crashed into the water. This occurred at or near Iwo Jima, while fighting the Japanese. A pilot named Jack Larsen had been there as well. Investigation determined that James Huston, Jr., had flown off the USS *Natoma Bay*, an escort aircraft carrier supporting the battle for Iwo Jima during World War II. Huston's plane had been downed by Japanese anti-aircraft fire and crashed into the water. A diagram in his squadron's after-action report depicting the flight paths of each plane on the mission showed Larsen flying alongside Huston.

Tucker (2022) is interested primarily in facts record-

ed in documents, but he is more willing than Sudduth to credit eyewitness testimony he finds credible. The squadron's after-action report did not mention Huston's plane being struck in the nose or on fire as it descended, probably because Huston was the "tail end Charlie" of the run and his squadron-mates were flying away from the scene at the time. However, Bruce Leininger interviewed four airmen (on three separate occasions) from another escort carrier who had seen Huston's plane hit. All said it was hit in the nose by flak fired from the ground, causing it to burst into flames.

When it comes to evaluating the veracity of memory claims, facts provided in witness testimony are in principle no different from facts recorded in contemporary written documents, although there may be more questions about their reliability. For this reason, researchers try to interview multiple first-hand witnesses independently and compare their testimony; the more consistency among witnesses, the more confidence there can be in what they have to say. Sudduth (2021c, 2022b) does not share this standard and dismisses all eyewitnesses to Huston's downing, saying that they are recalling circumstances long after the event, even though one of them refreshed his memory with a memoir he had written years before, closer to the time of its occurrence.

Reincarnation researchers have learned to attend to a case subject's behaviors, in addition to his statements. James's memories of Huston were preceded by nightmares of Huston's downing and accompanied by drawings of it. The behaviors that are of greatest interest to Tucker (2016) are those that were cited in the *Strange Mysteries* pilot. Following Schouten and Stevenson (1998), he terms cases with records of statements and behaviors made before the identification of the previous life (cases with early-bird documentation) "Type B" cases and cases with statements and behaviors recorded after the identification of the previous life "Type A" cases. In discussing Tucker's emphasis on early-bird testimony, Sudduth states:

Tucker's distinction between A and B cases overlooks a third classification of cases which Stevenson wrote about and which I briefly discussed in note 4 of my *JSE* essay (pp. 1011–1012): documentation made before anyone has even attempted to verify the claims of the subject (Stevenson, 1974, pp. 4, 71, 270–271). (Sudduth, 2022b, p. 94)

In practice, cases with early-bird documentation are those in which statements were written down before attempts to verify them were made (Matlock, 2021), so

Sudduth's distinction is a distinction without much of a difference. The James Leininger case is unique among early-bird cases in that there was no list of James's statements made before Huston was identified, much less before Bruce began his investigation. For Sudduth, this is greatly concerning, because "there are many ways the process of attempting to verify a subject's claims can contaminate the facts, especially when the inquiry is conducted by someone close to the subject" (2022b, p. 94).

True, but that is why the date stamps on Bruce's internet search results are so important. Bruce searched for "Natoma" on August 7, 2000. Sudduth (2022b, p. 99) wants to deny early-bird status to James's claim to have flown off *Natoma Bay*, despite the date on the search result, noting that *Natoma* was not cited in the *Strange Mysteries* pilot. But why would Bruce have conducted that search had James not mentioned the name? The *Natoma* claim does not stand alone. Around the same time, James said many other things about Huston that are recorded in a Master Timeline constructed by the Leiningers for Ken Gross in preparation for writing *Soul Survivor* (Matlock, 2022b).

Sudduth emphasizes that merely listing early-bird items is not enough; the items must be validated too: "[T]he ABC program only documents the Leiningers telling of the story in spring of 2002. Documenting *what* they said is not equivalent to documenting the *accuracy* of what they attributed to James" (2022b, p. 95; his italics). Past-life memory claims must be verified, of course. No reincarnation researcher would accept the veracity of early-bird statements without verifying them; their value lies not in their presumed truth, but in the assurance that they were expressed before the previous life was known. Tucker (2016, p. 204) indicates the sources of verifications for the Type B items on his list. James made one significant error: He was wrong that Huston died in a Corsair, but as it turned out, Corsairs were familiar to Huston, who had test-flown the plane for carrier landings and owned a model that hung in the ship's ready room for recognition training (Matlock, 2022b, p. 106). Sudduth, however, questions whether James got right the many things he is said to have gotten right:

The mind isn't a video recorder. Memory represents a reconstruction of earlier events. It's considerably less reliable than we assume, especially at the level of detail required in the JL case. And Bruce Leininger's memory is no exception. It actually fits the rule. He has, by his own admission, misremembered multiple important facts in this case.

So, the documentation in this case prior to

the identification of the previous personality is problematic in ways that Tucker has not acknowledged. There are more ways to get things wrong than to get them right, and I don't see that Tucker has alleviated these concerns. Consequently, the reliability of the early-bird documentation in this case is at best anyone's guess. (Sudduth, 2022b, p. 95)

This head-spinning, mind-bending declaration ignores the fact that major elements of the early-bird testimony are backed by dated documents and that most of those that were mentioned only in the *Strange Mysteries* pilot were later determined to be correct. To suggest that recorded statements which turn out to be correct might have been misremembered strikes me as ridiculous in the extreme.

Ordinary Sources of Information

James related many memories of Huston's life and demonstrated extensive knowledge of World War II military aviation not backed by dated documents or taped interviews and so without early-bird status. Sudduth (2022b, p. 94) properly remarks on the importance of including in an evaluation of the case all of James's statements, not only those with early-bird documentation. Tucker (2013, pp. 64–87) described many of these other items in *Return to Life* and I included a comprehensive list of them in my secure timeline (Matlock, 2022b, pp. 108–111).

At the heart of Sudduth's (2021c) argument is the supposition that James's accurate knowledge may be traced to ordinary sources of information. Sudduth went to considerable trouble to reconstruct what James would have seen in the Cavanaugh Flight Museum gift shop on his first visit. Although there was not a Corsair on display then, in one of his blog posts Sudduth (2022a) reports that he discovered one in James's neighborhood; this, he suggests, is why James erroneously said he was flying a Corsair at his death. According to Sudduth, another major source of information for James's memory claims was a video about the Blue Angels (Atkeison, 1994/2020) that his father purchased for him on their first visit to the Cavanaugh. This video is a documentary about the celebrated Navy promotional team that follows them on a European tour in 1993. James watched this video so often that he wore out the tape, obliging Bruce to purchase a replacement (Matlock, 2022b, p. 103). Sudduth maintains that the gift shop displays and video provide the details that James narrated and presented as memories, but do they?

Table 1 is a list of James's statements relating to Huston, abstracted from Table 1 in Part 1 of this paper (Matlock, 2022b, pp. 108–111). The statements, in the left-hand column, are numbered as in the earlier table, which provides their context. Statements made before and after the identification of James Huston as their referent are separated. September 25, 2002, is the approximate date Bruce received the squadron war diary that gave details confirming James's recollections. This was the first validation of any of his memory claims other than Huston's affiliation with *Natoma Bay*, which was documented in a January 7, 2001, search Bruce did for fatalities associated with aircraft carriers during World War II. Bruce was not fully confident in the identification until he heard from the third and fourth eyewitnesses to Huston's downing at a veterans' convention in September 2003, however (Matlock, 2022b, p. 106). Series of statements made on the same occasion are grouped together when they can be treated as a unit. Asterisks (*) mark 12 statements with early-bird documentation.²² Section signs (§) indicate that further information is supplied in Part 1.

In the right-hand column of the present Table 1 are evaluations of the correspondences to Huston (correct, partially correct, incorrect, unverified) and the sources of verification. Of James's 38 recorded statements or statement groups, 32 are entirely correct, one is partially correct, two are incorrect, and three are unverified. A dagger (†) indicates an item that James might have picked up from the Cavanaugh gift shop displays, according to Sudduth's (2021c) reconstruction, and a double dagger (‡) indicates an item he might have acquired from the Blue Angels video he watched obsessively for months. None of the items in Table 1 are marked with daggers or double daggers, casting doubt on Sudduth's (2021c, 2022b) confident and oft-repeated assertion that James's memory claims were derived from these ordinary sources of information.

I cannot understand why Sudduth places so much weight on James's exposure to ordinary sources of information when he's unable to identify any source that could have informed James about Huston's life or death. Tucker (2022, p. 89) made this point, but it doesn't seem to have registered with Sudduth. Instead, Sudduth emphasizes James's knowledge of military aviation, which he thinks James could have learned from ordinary sources. He overlooks the fact that many of the things James talked about—such as distinguishing a Zeke from a Betty and a Tony from a Zero—are not represented in either the Cavanaugh gift shop or the Blue Angels video, yet have reference to Huston's experience. Huston shot down both a Zeke and a Tony and so would have been familiar with these types of aircraft. Could James not have drawn on his

TABLE 1. James Leininger's Statements About His Previous Life and their Correspondence to James Huston

Statement Made by James Leininger	Correspondence to James Huston, Jr.
Statements made before identification of James M. Huston, Jr., c. September 25, 2002	
S1. One of JL's first words was "airplane." He would say "airplane crash" whenever he saw or heard an airplane.	Correct.
S2 (2000, Mar. 14). JL tells AL that appendage on bottom of toy plane is not bomb but "dwop tank."	Correct; this would have been within JH's knowledge.
S3 (2000, Aug. 11). The little man of his dreams was himself.	Correct, if JL was remembering being JH.
S4 (2000, Aug. 11). His plane crashed on fire,*	Correct, per eyewitness reports.
S5 (2000, Aug. 11). because it was shot by the Japanese.*	Correct, per JH's squadron after-action report.
S6 (2000, Aug. 12). He knew it was the Japanese because of the big red sun.	Unverified, but the Japanese flag bears a big red sun.
S7 (2000, Aug. 27). His name was James.	Correct.
S8 (2000, Aug. 27). He was flying a Corsair*	Incorrect.
S9 (2000, Aug. 27). off a boat*	Correct.
S10 (2000, Aug. 27). named <i>Natoma</i> .*	Partially correct. It was the USS <i>Natoma Bay</i> .
S11 (2000, Oct. 5). In his dream there was another pilot, Jack Larsen.*	Correct, per after-action report.
S12 (2000, Nov. 25). Seeing picture of Iwo Jima in book, JL says that is where his plane was shot and crashed.*§	Incorrect.
S13 (2001, late spring or early summer). He was "the third James"	Correct.
S14 (2000, summer). Japanese fighters were called Zekes and Japanese bombers were called Bettys.§	Correct.
S15 (2001, c. Sep. 1). He had been a pilot*	Correct.
S16 (2001, c. Sep. 1). whose airplane was shot in the engine*	Correct, per eyewitness reports.
S17 (2001, c. Sep. 1). and crashed into the water.*	Correct, per after-action and eyewitness reports.
S18 (2001, early May). Corsairs tended to get flat tires on landing.§	Correct.§
S19 (2001, early May). and they tended to turn to the left on take-off.§	Correct.§
S20 (2002, July 2). JL says on camera that Corsairs got flat tires when they landed.*§	Correct.§
S21 (2002, July 29). JL is overheard telling imaginary audience, "I was a Navy pilot and the Japanese shot me down."*§	Correct.
Statements made after identification of James M. Huston, Jr., c. September 25, 2002	
S22 (2002, Oct. 11). He found his parents at a big pink hotel in Hawaii. He also saw them dining on the beach.§	Unverified, but JL's parents stayed at a pink hotel when vacationing in Hawaii and one night dined on the beach.
S23 (2002, Oct. 20). When JL receives JH's model Corsair from AHB, smells it and says it smells like an aircraft carrier.§	Correct.
S24 (2002, Dec. 25). JL says he named his GI dolls Billie, Leon, and Walter because that's who he met when he died.§	Unverified, but Billie Peeler, Leon Conner, and Walter Devlin of the <i>Natoma Bay</i> pre-deceased JH.§

S25 (2002, Dec. 25). He named his dolls based on their hair color. Billie's hair was brown, Leon's was blond, and Walter's was red.§	Correct.§
S26 (2004, Jn. 25). When JL sees BL use sanding disk, says there weren't enough record albums on <i>Natoma Bay</i> .	Correct, per <i>Natoma Bay</i> veterans.
S27 (2004, Feb. 1). When served meatloaf for first time, JL says meatloaf was often served on <i>Natoma Bay</i> .	Correct, per <i>Natoma Bay</i> veterans.
S28 (2004, Aug. 1). JH had a sister named Annie and another named "Roof." Annie was four years older than JH and "Roof" four years older than Annie.§	Correct, per AHB.
S29 (2004, Sep. 11). When JL meets Bob Greenwalt, Greenwalt asks if he knows who he is, and JL says "Bob Greenwalt." Later JL explains that he recognized Greenwalt by his voice.§	Correct.
S30 (2004, c. Sep. 12). During tour of Nimitz Museum, JL notices five-inch cannon and remarks, " <i>Natoma Bay</i> had one of these." Asked where, says "on the fantail.§	Correct, per <i>Natoma Bay</i> veteran.§
S31 (2004, Nov 26). JL describes how Billie Peeler was killed in a plane crash while off duty.§	Correct, confirmed in letter to Peeler's mother.§
S32 (2004, Dec. 15). JH's father had been an alcoholic and this affected the family.§	Correct in all details, per AHB.
S33 (2005, Jan. 15). Speaking of Chichi Jima mission where JH died, LL says, "There were no fighters, only anti-aircraft fire on this hop."§	Correct.
S34 (2005, Mar. 3). There was an antenna missing from the side of a model FM-2 fighter plane BL made.§	Correct.
S35 (2005, Mar. 3). On <i>Natoma Bay</i> , they would make napalm bombs from drop tanks.§	Correct, per Jack Larsen.
S36 (2005, Apr. 1). JL says that Japanese plane shown on History Channel program is a Tony, not a Zero. "It [a Tony] is smaller and faster than a Zero."§	Correct. per <i>Natoma Bay</i> veterans.
S37 (2005, late Dec.). When AHB sends him a painting JH's mother made of him, JL asks her if he may have the painting their mother had made of her also.§	Correct, per AHB, who said only she and JH knew this.
S38 (2006, Sep. 4). At memorial service in Futami harbor on Chichi Jima for JH, JL recognizes direction from which JH flew in.§	Correct, confirmed by BL from diagram in after-action report.

People: AHB = James Huston, Jr.'s sister, Anne Huston Barron. AL = Andrea Leininger. BL = Bruce Leininger. JH = James Huston, Jr. JL = James Leininger.

* Has early-bird documentation.

§ For details, see Part 1 of the present article (Matlock, 2022b).

† Documented in Cavanaugh Flight Museum gift shop, per reconstruction by Sudduth (2021c).

‡ Mentioned in Blue Angels video watched by JL.

past-life memory for this knowledge (Matlock, 2022b, p. 112)? Sudduth does not address the possibility.

Sudduth says almost nothing about the behaviors James exhibited in line with his claimed memories. These behaviors are listed in Table 2, again abstracted from Table 1 in Part 1 of this paper, and given the B numbers assigned there (Matlock, 2022b, pp. 108–111). The behaviors are grouped by class (James's nightmares and post-

traumatic play, his regular play and artistic expression, behaviors that appear to have been cued, and behaviors of a general nature that do not fit into one of the other classes). Consistencies and inconsistencies with what is known about Huston are marked in the right-hand column. As in Table 1, section signs indicate that further information is supplied in Part 1 of this paper. Asterisks indicate items with early-bird status, daggers those which

might be based on things seen in the Cavanaugh gift shop, and double daggers those conceivably prompted by the Blue Angels video.

All of James's behaviors listed in Table 2 are consistent with Huston's life. None appear to have been modeled on the Cavanaugh gift shop displays. Three (B9, B5, and B12) conceivably were influenced by the Blue Angels video (Atkeison, 1994/2020), but only in the most tenuous way. The video shows parts of pre-flight checks (B9), although it does not foreground these. Pilots are regularly shown wearing headgear, but never in the act of putting it on (B5, B12), much less going through other preparations for flying (B5). At the same time, both the gift shop displays and video contain many images that are not represented in James's memories of military aviation or Huston's life and death.

Sudduth (2022a, p. 95) asserts that Tucker's (2022) response to his discussion of James's ordinary sources of information "involves considerable obfuscation and misdirection," whereas that is what Tucker and I are alleging of his treatment. Again, it seems we are attending to different things. What is paramount for Tucker and me is how well James's memory claims and behaviors match what is documented about Huston's life and death. Sudduth is endeavoring to question the matches by raising what seem to us to be irrelevancies. Rather than providing James with details of his memories, his exposure to museum displays and, especially, watching the Blue Angels video incessantly, appear to have helped draw memories of Huston into his conscious awareness and make the memories clearer in his mind. This sort of triggering is a major feature of past-life recall, especially as subjects age (Matlock, 1989, 2019), and many of James's later statements about Huston came in response to things he saw and heard (Matlock, 2022b, p. 112).

Summation: Muddied Waters

Sudduth considers the "central question" of his (2021c) paper to be, "*Why are any of the presumed facts of this case evidence—decent, dandy, or damn good evidence—for reincarnation?*" (2022b, p. 99; his italics). I take it that by "presumed facts" he means James's confirmed memory claims. The confirmations in and of themselves are significant, given that James should not have known any of these things. This is especially true of the statements with early-bird status, because there is no doubt that James related them before the identification of Huston as their referent. But it is not merely that individual statements are verified, it is that there are so many of them and that James's identification with Huston is supported by a variety of behaviors. It is the whole ensemble, not any piece

in isolation, which suggests reincarnation. Reincarnation has a logical advantage, in that it can more plausibly explain James's verbal and behavioral identification with Huston than ordinary sources of information can. And James's case does not stand alone: There are many other cases of the same caliber in the published record.

Sudduth's (2021c, 2022b) bluster notwithstanding, there is nothing in the ordinary sources of information to which we know James was exposed as a toddler that could have informed him about Huston's life and death, nor is it easy to imagine what ordinary sources there might be that could have so informed him. Only a small fraction of James's reported memories and behaviors have early-bird status, but of those the accuracy of the majority are confirmed. From the perspective of reincarnation research, much of Sudduth's exegesis is irrelevant, as Tucker (2022, p. 89) affirms. It is irrelevant because it deflects from the core concern, the question of whether there is satisfactory support for James's past-life memory claims. Although Sudduth appears to appreciate this and returns to the problem repeatedly, his argument overall does more to muddy the waters than to clarify them. In this, he is in good company with self-described skeptics of reincarnation.

Fraser Nicol (1976) insinuated fraud on the part of Indian lawyer K. K. N. Sahay (1927), who not only recorded in writing, but published, his son Jagdish Chandra's past-life memories before he set about verifying them. Stevenson (1975) later went over this case, interviewed Jagdish Chandra in adulthood, and added additional details. He (Stevenson, 1977b, 1977c) protested the imputation of fraud, introduced by Nicol apparently on no basis other than his inability to think of a better "normal" explanation for the accuracy of Jagdish Chandra's memories. Nicol (1977a, 1977b) doubled down rather than back down on the fraud theory, and Paul Edwards (1996, pp. 256–258) embraced Nicol's analysis uncritically. Nicol's stance is not unlike Sudduth's (2021a, 2021b, 2021c) insistence on portraying the Leiningers not only as unreliable witnesses, but as having distorted the timeline of events in *Soul Survivor* to support their favored narrative (2021c, pp. 987–990). This theory has nothing going for it except that it does not require us to take reincarnation seriously as a possibility.

We might describe Sudduth, Nicol, and Edwards as pseudo-skeptics as opposed to real skeptics. Bruce Leininger was a real skeptic, whose doubts about reincarnation gave way as evidence of the accuracy of James's past-life memories accumulated (Matlock, 2022b). Sudduth, Nicol, and Edwards evince what may be termed a will to disbelieve, and this brings them to imagine all manner of possibilities alternative to what the evidence attests.

TABLE 2. James Leininger’s Behavioral Memories of James Huston

James Leininger’s Behavior	Correspondence to James Huston
B2 (1999, Aug. 15). AL and BL return home from night out to find JL shrieking and crying in his sleep. [§]	Consistent.
B3 (2000, early May). JL begins having nightmares 3-5 times weekly until Feb. 2001, after which they come much less frequently. [§]	Consistent.
B11, B16, B20 (2002, 2003, 2004, Mar. 2). JL has nightmare on anniversary of JH’s death in 2002, 2003, and 2004, after frequency has lessened. [§]	Consistent.
B4 (2000, May-June). JL begins bashing planes into coffee table, breaking off propellers. [§]	Consistent.
B6 (2000, Aug. 1). JL demonstrates little man trying to kick his way out of plane in his waking state. [§]	Consistent. JH would have been trying to kick the canopy off his plane. per <i>Natoma Bay</i> veterans.
B7 (2001, late Spring or early summer). Shortly after 3rd birthday in 2001, JL begins drawing battle scenes, particularly naval scenes with aircraft, signs some James 3. [§]	Consistent.
B13 (2002, Apr. 15). JL makes cockpit in the closet of Bruce’s home office from old car seat and other articles, plays at plane crashing. [§]	Consistent.

Regular Play and Artistic Expression

B10 (2001-2002). JL plays with GI Joe dolls daily, bathes with them, sleeps with them. [§]	Consistent. The dolls resembled flyers JH had known. JL named them accordingly.
B15 (2002, Sep. 2). JL and cousin play war and "shoot Japs" at community swimming pool. [§]	Consistent.
B21 (2004, Oct. 31). At school, JL decorates pumpkin to resemble F-16 Thunderbird.	Consistent.

Cued Behavior

B1 (from c. April 1999). As an infant, JL points to airplanes in sky multiple times a day.	Consistent.
B8 (2001, late spring or early summer). While playing with an airplane, JL stands up and salutes, saying, "I salute you and I'll never forget."	Consistent.
B9 (2001, Oct. 30). At Sertoma (Louisiana) Airshow, conducts what the Ls are later told looks like a pre-flight check on an airplane. [§]	Consistent. [†]

They are far from alone in this attitude, which, it seems to me, is responsible, more than any other factor, for reincarnation research not receiving the respect it deserves. I do not mean to assert that all past-life memory claims are indicative of reincarnation. I and other researchers (Haraldsson & Matlock, 2016, pp. 255–260; Rivas, 1991; Stevenson et al., 1988) have documented several spurious

identifications. We did so by following the evidence, not by refusing to credit it. Why does this approach encounter so much resistance from the academic community? Why do so many scientists and scholars cling to a will to disbelieve rather than follow the evidence before them? Phrasing the question like this suggests that these scientists and scholars are familiar with the evidence for

B17 (2003, Oct. 20). JL appears to recognize pewter statue of George Washington and B18 Corsair model from Natoma Bay from JH's effects, places statue on desk in his room. [§]	Consistent. AHB verified JH had the statue of George Washington on his desk.
B19 (2003, Dec., or 2004, Jan.). BL pieces together world map and asks JL where JH's plane went down. JL points to vicinity of Iwo Jima and Chichi Jima. [§]	Consistent.

General Behavior

B5 (2000, May-June). JL begins ritual when getting into car seat. Puts on imaginary headphones, facemask, and harness (seat-belt), as if preparing to fly a plane.	Consistent. [†]
B12 (2002, before Apr. 15). At local air show, JL mounts cockpit of Piper Cub, grabs the headgear and puts it on with "chilling familiarity."	Consistent. [†]
B14 (2002, July 29). JL likes to pretend he is a singer and will stand on the head of our bed and sing. [§]	Consistent, per AHB. JH had a good singing voice.

AHB = James Huston, Jr.'s sister, Anne Huston Barron. AL = Andrea Leininger. BL = Bruce Leininger. JH = James Huston, Jr. JL = James Leininger.

Notations: [†]Has early-bird documentation. [§]For details, see Part 1 of the present article (Matlock, 2022b). [†]Portrayed in Cavanaugh Flight Museum gift shop, per reconstruction by Sudduth (2021c). [†]Portrayed in Blue Angels video watched by JL.

reincarnation, whereas I suspect most are not. They rely on gate-keeping pseudo-skeptics such as Sudduth, Nicol, and Edwards to tell them what to think; their will to disbelieve reinforced, they see no need to examine the evidence for themselves. The will to disbelieve has much to do with a conviction that reincarnation cannot possibly occur because consciousness is generated by the brain (a physicalist dogma linked to materialism), rendering postmortem survival inconceivable. Another problem is that researchers rarely make clear how they conceive reincarnation to operate. There are many different ideas about reincarnation in the world's religious traditions, and without an evidence-based theory of reincarnation, the concept is too nebulous to support scientific argumentation. If we are to move reincarnation beyond the default position it currently holds in explanatory models, we must spell out how we understand it to work. I address these topics in *Signs of Reincarnation* (Matlock, 2019) and return to them below. In the end, I am not sure there is anything researchers can do to break through committed pseudo-skepticism, but we can try harder to reach colleagues prepared to follow evidence where it leads.

COUNTERING THE WILL TO DISBELIEVE

In his editorial introducing the journal issue in which Sudduth's (2021c) critique of the James Leininger case appears, Stephen Braude writes:

All CORT [cases of the reincarnation type] cases are messy. Investigators must interview the subject, family members, and (when possible) crucial figures in the life of the previous personality. In fact, it typically requires considerable detective and interpretive work merely to identify the previous personality from the often vague or ambiguous behaviors and statements of the subject. And then, investigators must still obtain testimony from the remaining living persons (if any) who knew the apparent previous personality, simply to establish that the subject's apparent recollections about the previous personality are reliable. Moreover, the interview process can be muddied by the fallibility of memory, and by conscious or subconscious motives either to please (or frustrate) the interlocutor or simply to confirm a deep wish for the case to be a genuine instance of reincarnation. And of course, many cases also require the services of translators whose own biases, inadequacies, and needs might influence the direction or accuracy of the testimony obtained. (Braude, 2021b, pp. 726–727)³

Braude is mistaken that "it typically requires considerable detective and interpretive work merely to identify the previous personality." In many Asian cases, children

specify precise details, including the names of people and places, that permit their parents to trace the previous persons rather easily. Children frequently show the way to what they say are their former homes and recognize articles and people there. Consequently, most of Stevenson's Asian cases were solved by the subjects' families before he arrived on the scene. That is why there are so few Asian early-bird cases. As of 2005, cases with early-bird documentation accounted for only 33 of more than 2500 cases, the vast majority Asian, in the University of Virginia files (Keil & Tucker, 2005, p. 97).⁴ Even in Western cases, it is not always hard to identify the previous person. It took Rylann O'Bannion's mother no more than five minutes searching online to identify Jennifer Schultz once Rylann remembered dying in a plane crash, given that she had previously said she might have lived in Louisiana (Matlock, 2019, p. 6). A case I am presently studying was solved when the case subject's mother posted about her son's memory claims in my Signs of Reincarnation Facebook group, and her account was recognized by the previous person's mother.

Braude is right to warn about witnesses' potential memory failings in the absence of early-bird documentation, but "the services of translators" are of less moment than he assumes. Stevenson worked with teams of local assistants and most of his Asian interpreters were academic colleagues, some of whom co-authored journal papers with him. Among 33 published early-bird cases, only two required interpreters in recording the initial testimony (Matlock, 2021), and an increasing number of cases are being investigated and reported by natives of the countries in which they develop (see under Local Researchers, below).

Skeptics are fond of citing the critique of Stevenson's work by Champe Ransom, his research assistant in the early 1970s. Ransom's critique was first publicized by D. Scott Rogo (1985), then amplified by Paul Edwards (1996). A lengthier, yet still abbreviated, version of his remarks has since appeared (Ransom, 2015), and we can see that they were made in relation to the first edition of *Twenty Cases Suggestive of Reincarnation* (Stevenson, 1966). Ransom alleges problems similar to those broached by Braude (2021b), adding concerns about Stevenson's practice of spending only a few days conducting interviews on a case. These few days do not constitute the entirety of Stevenson's involvement with a case, however. He had colleagues gather information before and after his visits and returned to cases repeatedly over periods of years to check on witnesses' memory reliability and monitor the subject's development (Matlock, 2019, p. 107).

Keith Augustine (2015) presents a catalog of criticisms of Stevenson's research but appears to have read none of

the original case reports. Critics who make original points often betray how little informed they are. Leonard Angel, widely considered the foremost skeptical authority on Stevenson, is under the impression that Stevenson began his fieldwork in the 1950s (not 1961) and concluded it in the 1970s (not 1990s) (Angel, 1994, pp. 273–274). He (Angel, 2015, p. 577) says that Stevenson wrote four books, whereas Stevenson authored 15 books (Matlock, 2019, p. 103). Murray and Rea (2008, p. 276) state that Stevenson produced two volumes under the heading *Cases of the Reincarnation Type*, dating both to 1975, whereas Stevenson issued four volumes in the series between 1975 and 1983. Murray and Rea (2008, p. 277) assert that "independent investigation" of Stevenson's work "has turned up methodological flaws in the vast majority of his case studies," declining to provide support for this contention.⁵ Uninformed criticisms, with critics citing each other without reviewing the original sources, produce little more than noise, yet the racket deters scientists and scholars who otherwise might be interested in the work from examining it for themselves.⁶

Michael Nahm (2021) notes that the skeptical critique is grounded in a "motivated physicalist model," according to which "protagonists involved in CORT are driven to create them artificially by conscious or unconscious motives, thereby fulfilling psychological needs adapted to the prevailing cultural context" (p. 40). The processes to which Nahm alludes include parental influences on behavior and distortions of memory, such as paramnesia and cryptomnesia, affecting witness testimony. Without question, investigators must be concerned with these and other "normal" factors (Stevenson, 1974, pp. 331–343; 2001, pp. 150–164), although their impact on the cases is hugely overdrawn in skeptical commentary. Nahm maintains that these mundane factors cannot account for strong early-bird cases, but as we saw with Nicol (e.g., 1976) and Sudduth (e.g., 2021c), this has not stopped critics from finding fault with early-bird case investigations. Thus, despite its evidentiary assets, early-bird documentation alone seems unlikely to break through the will to disbelieve. A major take-away from the Sudduth–Tucker exchange is that we must go wider if we hope to bypass pseudo-skeptical gatekeepers and reach a receptive scientific and scholarly audience.

Stevenson left us a sound methodology, involving interviews with multiple first-hand witnesses on both the present- and previous-life sides of a case, coupled with the collection of death certificates, police records, autopsy reports, and other documents to check and augment witness testimony. Stevenson's methods continue to be followed by the reincarnation research community. They have been endorsed by numerous authorities, among

them psychologists J. G. Pratt (1973), Alan Gauld (1982), and John Beloff (1990), and philosophers Robert Almeder (1992), R. W. K. Paterson (1995), and David Ray Griffin (1997), whose voices unfortunately have been drowned out by the pseudo-skeptical cries. This does not mean there are no improvements to be made, but the more important improvements have little to do with common critical complaints, which are not as momentous as they are made out to be (Matlock, 2022d). I have grouped my proposals under three headings: Case Study Methodology, Reporting Standards, and Statistical Analysis.

Case Study Methodology

Several critics have made suggestions for changes in case study practices they say would help alleviate their concerns.

Lester's desiderata. David Lester (2005) advances six desiderata for reincarnation case investigations.

1. The investigators must be present from the start. A case is required, in which, when a child begins to recall a previous existence, the words that he says are recorded right from the beginning.

2. The record should involve videos of the child, or at least audio recordings, permitting verbatim transcripts and observations of whether coaching or prompting of the child took place.

3. Preferably, the investigators must be present continuously from this point on so that they can monitor what the child is told by his or her parents, relatives, friends of the family, and acquaintances.

4. The desires of parents or others for the reincarnation to be valid interfere with the case. . . . Thus, the investigators should include believers and skeptics, and they should take care to minimize the influence of parents and relatives on the child. . . .

5. Cases for reporting should not be selected; rather, all cases should be recorded, examined, and reported for others to examine.

6. Prior to the arrival of the investigators, the child should not be allowed to visit the place of the previous incarnation or meet people who knew the previous incarnation. . . . (Lester, 2005, pp. 148–150)

Lester (2005) demonstrates that he has read extensively in the case material, a rarity among skeptics, so his recommendations deserve careful consideration. I have

to wonder how seriously he takes them, though. Does he really imagine families would allow the intrusion into their lives that a team of skeptics and believers monitoring them “continuously,” perhaps for years, would pose? On top of this, there is the inhibitory effect their presence might have on the young child. Most children with past-life memories relate them sporadically, as they come to their minds, and many are shy around strangers. Occasionally one encounters a child with extensive memories who can respond to questions, but this is not the norm.

Moreover, it is never clear how a case will develop after a child's first allusion to having lived before. Many children, especially in Western countries, make one or a few statements, then drop the subject. Also, there may be nonverbal memories expressed before a child starts to speak about the previous life. James Leininger had recurrent nightmares for months before he began to tell his parents what they were about—a “little man” unable to escape an airplane on fire. Lester doesn't trust a case subject's parents to be objective observers, but I don't see how we can avoid depending on them. Parents, siblings, and other caretakers are in the best position to observe a child and note statements, behaviors, and emotional displays from the outset. In some early-bird cases, parents were the first to document a child's statements (Matlock, 2021).

Researchers are rarely in a position to ensure that a case subject has not met the previous family before the start of their investigations. Most of Stevenson's cases were “solved” by the families before he learned about them. Going forward, researchers may wish to prioritize cases which have not yet been solved, so that they can observe and control their development, but this complicates Lester's fifth desideratum, documenting all cases of past-life memory. Apparent past-life memories are reported far more commonly than Lester may realize, but the majority are too weakly developed to permit verification and so remain unsolved.⁷ With the limited resources available, researchers must choose which cases to study. Erlendur Haraldsson appreciated that this might produce biases, so randomly selected three cases from a sample of 29 about which he and his Lebanese colleague Madj Abu-Izzeddin had collected preliminary information (Haraldsson & Abu-Izzeddin, 2004). The three cases do not differ appreciably from other cases of their type. One is relatively weakly developed and another is unsolved, but Stevenson and others have published numerous weakly developed and unsolved cases. For a comprehensive inventory of cases from a single culture, most weakly developed and unsolved, see Rivas (2020) regarding the Netherlands.

Audio and Video Recordings. Vitor Visoni (2010),

like Lester (2005), is concerned about parental influences on children recounting past-life memories and urges the use of audio and video recordings to screen for this. Kemal Atasoy was six years old but retained clear memories when interviewed by Jürgen Keil, in the presence of his mother (Keil & Tucker, 2005). Visoni fears Kemal's mother might have helped Kemal "in a subtle way, to answer the questions" (2010, p. 104), but since Keil chose not to employ a tape recorder, this possibility cannot be appraised. In reply, Keil and Tucker (2010, p. 295) note that Kemal's mother could not have shaped his testimony, because she knew nothing about the events described, which turned out to pertain to an Armenian man who had died in Istanbul, 850 kilometers away from Kemal's home in central Turkey, 50 years before his birth. Keil and Tucker defend Keil's decision not to record his interview with Kemal, saying that although this may seem ideal, "the process of getting [recordings] can be impractical, or worse can impact on the quality of the information being obtained" (2010, p. 295).

Stevenson similarly preferred to make written notes rather than tape recordings, observing that recordings "become filled with irrelevancies, and they miss many of the nonverbal features of the interviews." Stevenson tried "to record on tape whatever the subject himself tells us he remembers about the previous life" (2001, p. 135), however. Videos sometimes reveal issues missed in the moment (Mills, 2003), and with the greater ease of video recording with devices such as cell phones, the advantages of a video record easily outweigh the problems attendant to audio recording. Researchers therefore might wish to employ video routinely, although if parents do not consent to making the recordings public, its use will be restricted to the investigation. Happily, such videos often can be shared. An increasing number of videos of children relating past-life memories are appearing on the internet. Kuldip Dhiman (2022c) has begun to post his Indian case investigations to YouTube with English-language narration and subtitles.

Ohkado Masayuki (Ohkado, 2018) describes a pilot study inspired by Deb Roy's (2009) "naturalistic longitudinal recordings" of young children's speech development, from which much can be gleaned about the interaction between children and their caretakers. Ohkado asked mothers to record their children's responses to questions about birth, womb, pre-life, and past-life memories. Because many children replied that they did not have memories of these types, Ohkado argues that suggestion is not a hazard of this method. There remain ethical issues related to the encouragement of past-life recall in young children who do not report memories spontaneously, due the manifold difficulties the memories may present to the

children and their families (Matlock, 2019, pp. 193–200), and this would have to be monitored and managed. Nonetheless, Ohkado's prospective approach allows cases to be followed from their inception, something called for by Lester (2005), and has the potential to enrich our understanding of past-life recall.

Controlled Testing. Angel (2015) would like to see "controlled experimental work" comparing matches between a pair of "co-living" individuals, "X cases," with comparison of a case subject's statements to facts about his predecessor, "Y cases," in order to rule out chance correspondences in the identifications of previous persons and establish that there is something in need of explanation. Researchers would have established that there was something in need of explanation only if (a) "the correspondences of co-living pairs in X cases is as good as those between pairs in Y cases," and (b) blind judges "tend to ask for special explanations of the correspondences in the Y cases more often than they tend to ask for explanations of the correspondences in the X cases" (Angel, 2015, p. 576).⁸

Edelmann and Bernet (2007) are correct that "no attempt has ever been made to compare the child's score in describing the designated household with a control household" (p. 94). They sketch a complex research protocol intended to address this shortcoming, but unfortunately it is unworkable as presented. Their project would proceed in four phases, employing three teams of investigators independent of each other and of the project director. In the first phase, one team would interview the child with past-life memories; in the second phase, a different team would interview the child's parents; in the third phase, a third team, unaware of anything the child or his parents have said, would collect data about an identified previous person as well as about a second, unrelated (control) person; in the fourth phase, the project director would collate the data, determine if the child's statements matched the identified previous person better than the control, and write up the case report.⁹

This project assumes that a previous person has been identified before the investigation begins, but the most serious flaw in the design is the requirement that the third team collect data about the previous person without knowing what the case subject and his parents have contributed. The idea of having different teams work on the two sides of a case is good, as is the use of controls, and reincarnation research could profitably adopt these practices. However, if investigators of the previous-life side of a case have no knowledge of what the case subject has said, they would need to collect vast amounts of data for there to be any chance of evaluating all of a subject's statements. A better idea would be to furnish the team

with a list of statements and behaviors with decoy items mixed in with actual items, not informing them which were which (Matlock, 2019, pp. 109–110). The same list could be assessed against a control child without past-life memories, or controls could be drawn from a pool of other children from the same culture whose cases have been studied previously.

Checklists with decoy items might be presented to case subjects as well. In a variation of this technique, Tucker (2013, pp. 105–106; 2021, pp. xii–xiii) uses photographs in controlled recognition tests. He presents subjects with sets of pictures, only one of which is associated with the identified previous person. Ideally, the pictures would be presented to the subject by an investigator who did not know which were the targets. Similar tests could be done with sets of articles. Delorme et al. (2021) suggest that a dying person be asked to “assemble a collection of their unique favorite objects” and give them to researchers in a sealed box without informing them of its contents. If later a child claimed to remember the dying person’s life, he would be asked to describe the contents of the box and it would be opened. Since no living person knew what was in the box, correct identification of the objects would support the reincarnation hypothesis, “barring the possibility of clairvoyance”—but given that clairvoyance is among the factors that researchers must rule out as an alternative to past-life memory, this would hardly serve as a decisive test of reincarnation.

A better-designed prospective study would take advantage of the ability to plan reincarnation before death, as has occasionally been done. Some planned reincarnations involve predictions of congenital physical anomalies such as birthmarks or birth defects (Matlock, 2019, pp. 154–155). Another strategy to explore would be cadaver marking, which is related to “experimental birthmarks” in a large swathe of eastern Asia and occasionally elsewhere in the world (Matlock, 2017a; Tucker & Keil, 2013).

Process Variables. To date, reincarnation case studies have focused on “proof” as opposed to “process” issues, a legacy of psychical research investigations of apparitions, poltergeists, and ESP. Tucker (2022, p. 84) expresses this orientation when he writes, “The two most important issues in any case of the reincarnation type . . . are what the level of evidence is that the child possessed accurate information about the life of the previous personality and whether the child could have learned this information through ordinary means.” The emphasis on establishing veridicality while ruling out sources of knowledge alternative to reincarnation is what distinguishes the parapsychological approach from the approaches of mainstream psychology and anthropology. I think we would be wrong to abandon it. However, as David Hess (1988) observed

years ago, this need not be an either/or situation, and investigators would do well to pay more attention to process variables in the cases they study.

Braude (1995, 2003, 2021a) has been at the forefront of advocating for more psychological sensitivity in reincarnation case studies. He says:

[A] solid majority of the investigations betray a lamentable and often surprising psychological superficiality—treating the subject and relevant others as mere psychological stick figures, rather than the real-life steaming, stinky caldrons of issues, fears, and hidden agendas that deeply influence human behavior. . . . Second, the case studies too often provide only shallow treatment of key topics having their own extensive and obviously pertinent literatures—for example, on the nature of language mastery, and the mysteries of savants, prodigies, and dissociative creativity. (Braude, 2021a, pp. 36–37)

Braude makes good points here, although he apparently means to suggest that investigators are missing things that would bolster interpretations of the cases alternative to reincarnation. Consideration of psychological factors sometimes can show past-life memory claims to be false (e.g., in cases of self-deception: Stevenson et al., 1988). But this must be demonstrated, and I do not see that Braude (1995, 2003) has demonstrated it in the case of Uttara Huddar, which he often cites in illustration. I think it is fair to say that Stevenson (1984; Stevenson & Pasricha, 1979, 1980), while acknowledging Uttara’s psychological problems, places little emphasis on them, instead stressing her highly unusual behavior and responsive use of an archaic dialect of Bengali that are consistent with the person her alternate personality (Sharada) claimed to be; but it is also true that Braude, in highlighting the psychological elements of the case, barely confronts the parapsychological ones.¹⁰

Visoni (2010, p. 106) would like to have seen psychological tests conducted to answer what he regards as “basic questions” in the case of Kemal Atasoy (“Could the child be easily influenced? Does the family possess some history of psychological disorders?”), to which Keil and Tucker (2010, p. 296) respond that they are “unaware of any psychological disorder that could lead a child to know numerous details about a man who lived 850 km away and died 50 years before.” Be that as it may, in one case (Pasricha et al., 1978), past-life memories emerged in a psychotic state. Sometimes with children, although more often with adults, dissociative states are implicated in past-life memory retrieval (Matlock, 2019, pp. 206–

207). Braude (1995, 2003) notes that dissociative states, such as that which Uttara entered during her Sharada phases in her 30s, are psi-conducive, but since dissociative states are associated with past-life memory retrieval also, it would seem unwise to place much weight on the psi-conducive nature of these states as evidence for an alternative mode of information acquisition in reincarnation cases.

Braude (2021a) is right to draw attention to the “shallow treatment” of psychological and other pertinent topics in many cases. The proof orientation of reincarnation research means that these issues have not received concerted attention. If researchers do not have the backgrounds necessary to attend to them, specialists could be added to the investigation teams. Having a therapist on the team would be helpful with cases involving mental health issues. Families frequently contact researchers with mental health concerns, but few researchers have the training to deal with them.

Local Researchers. Stevenson investigated cases worldwide (1977a), in many cultural and linguistic settings, often requiring interpreters. Erlendur Haraldsson and Jürgen Keil likewise needed interpreters in Sri Lanka, Thailand, Myanmar, Lebanon, and Turkey. Anthropologist Antonia Mills studied Hindi as an aid to her work in India, but never became fluent in it. The interpreters on whom Stevenson, Haraldsson, Keil, and Mills relied were not invariably tourist interpreters, as critics apparently assume. Some were, but the majority were persons (often fellow academics) who assisted Stevenson and his colleagues not only in interpreting but by undertaking interviews and other activities of their own.

Until recent years, local researchers rarely took the lead in investigating and reporting (the main exceptions being Satwant Pasricha [2008, 2019] in India, and Hernani Andrade [1988] in Brazil). As reincarnation research has moved away from reliance on elite investigators, this situation has changed. Titus Rivas (2003, 2020) and Dieter Hassler (2013, 2018) have sought out cases in the Netherlands and Germany, respectively. K. S. Rawat (Rawat & Rivas, 2021), who assisted Stevenson, and Kuldip Dhiman (2002a, 2002b, 2022c), who assisted Mills (Mills & Dhiman, 2011), have contributed cases from India. In an essay submitted to the recent Bigelow Institute (BICS) competition, Akila Weerasekera and Shanaka de Silva (2021) describe a new Sri Lankan case. Ohkado Masayuki (Ohkado, 2013, 2016, 2017, 2022) has written about several Japanese cases. Meanwhile, Jim Tucker (2013, 2021) and I (Haraldsson & Matlock, 2016; Matlock, 2019, 2022a), along with K. M. Wehrstein (2019, 2021), have concentrated on cases in English-speaking regions.

Apart from Pasricha, Rawat, and Tucker, none of us

were trained by Stevenson, but all employ his methodology. The cases we have studied are similar to those reported by Stevenson and his first-generation colleagues, replicating their research and its findings. The contributions of researchers native to the languages and cultures in which these cases develop help address concerns about Stevenson’s potential misunderstanding of the data he was collecting. Work by local researchers is to be encouraged; I hope and expect that we will see more of it in the future.

Remote Research and Interviewing. Fieldwork, entailing personal interaction with the case subject and witnesses on both sides of a case, is central to Stevenson’s methodology. Fieldwork remains the ideal investigative strategy with reincarnation cases, especially in more complex cases and cases headed for journal publication, but this does not mean that other strategies are unacceptable. Remote interviewing over Zoom or similar services does not require travel and can be an inexpensive and effective means of involving multiple members of a team (including, potentially, skeptics). Zoom sessions can be recorded and archived for later reference. Interviews conducted through instant messaging and email leave written records that can be consulted and quoted.

Online resources can greatly assist research, especially with the growing number of cases reported from Western countries. They were crucial to Bruce Leininger in pursuing James’s memory claims. Scott Perry recalled an historic event, the 1937 Los Angeles New Year’s Flood, which is documented in newspaper archives which, along with genealogical, meteorological, and other online records, proved invaluable in studying his case (Matlock, 2022a). K. M. Wehrstein (2019, 2021) relied on online resources in her investigation of Will’s adult memories of Wilhelm Emmerich and Wilhelm Schmidt. Research of this kind leaves a track record that can be declared and replicated, providing another hedge against criticism.

Reporting Standards

In this section, I am concerned not with case study methodology, but with the reporting of results.

Journal Publication. In science, publication in peer-reviewed journals is more highly esteemed than publication in books. Ideally, data are presented first in journals and only later released in books. For this reason, in their scoping review of the reincarnation research literature, Moraes et al. (2022) examined journal publications exclusively. They identified 78 reincarnation studies published between 1960 and 2021, 47 of them containing case reports. Since several of these papers treated more than one case, the total number of cases described in

journal publications is somewhat higher than this. Even so, it represents a severe undercount of published cases. There is no definitive count of cases available in books as well as journals, but they likely total between 400 and 500, 225 in Stevenson's (1997) massive two-volume *Reincarnation and Biology* alone.

Moraes et al. (2022) found an upward trend in the number of research publications, with a peak around the year 2000 and a decline in the present century. This makes sense, inasmuch as Stevenson was responsible for the great majority of journal papers and his output declined after 2000; he died in 2007. I want to draw attention to a different trend, however—the trend away from publishing cases in journals to publishing them in books. Stevenson increasingly turned to books for his reports. This was due to the number of cases involved; journals were reluctant to allot space to the same topic from the same author quarter after quarter. But the trend did not end with Stevenson. Although Haraldsson, Keil, and Mills have published in journals,¹¹ as have Hassler, Ohkado, and Wehrstein, Tucker and I have favored books over journal publication. We both have journal publications (Matlock, 2022a; Tucker, 2016; Tucker & Keil, 2001), but have described most of our cases in books (Haraldsson & Matlock, 2016; Matlock, 2019; Tucker, 2013, 2021).

The trend away from journal publication has been exacerbated by the rise in self-reported and parent-reported cases aimed at the general public rather than the scholarly reader. The James Leininger case was first reported by his parents (Leininger et al., 2009), summarized by Tucker (2013) in a general-interest book, and only later treated in a journal paper (Tucker, 2016). Book publication is only marginally effective in reaching a scholarly audience and may be one reason Stevenson's work is regularly misrepresented in critical writings. I believe Tucker and I would do well to reverse our practice and give more attention to publishing case reports in journals. I will go further and encourage publication in open access journals, due to their greater visibility on the web. Another thing researchers might consider is restudying more cases that have appeared in popular publications, as Tucker (2016) did with James Leininger (Leininger et al., 2009) and Mary Rose Barrington (2002) did with Jenny Cockell (1994).

Researchers may want to give more attention also to submitting their work to mainstream publications. This typically means writing more briefly, downplaying proof-oriented concerns, and discussing what may appear to be peripheral issues. The language and presentation should be appropriate for the target audience, as in a study by Marieta Pehlivanova et al. (2018). As Hess (1988) pointed out, attending to nonevidential (as well as evidential) aspects of "paranormal" phenomena is one of

the surest ways for parapsychologists to attract support from other disciplines because the broader relevance of the phenomena becomes clearer. Stevenson (e.g., Stevenson & Pasricha, 1979, 1980) sometimes published a brief report in a mainstream journal, followed by a fuller report in a parapsychology journal.

Timelines and Tables. In his analysis of the James Leininger case, Sudduth (2021c) is greatly concerned with the chronology of events. "The plausibility of the reincarnation interpretation of this case depends essentially on there being a credible chronology of events," he says (p. 935)—which is why I devoted Part 1 of this paper to establishing a secure timeline. I agree with Sudduth (2021c) that "a chronology must include contextual details that bear on the adjudication of various proposed explanations of the subject's behaviors and claims" (p. 935) and that "without a robust chronology of events, we're flirting with confirmation bias" (p. 945).

The last is true of all reincarnation cases, I think. It is important to show how a case unfolds, step by step, from a child's first verbal or nonverbal reference to a previous life through the identification of a person whose life matches the child's memory claims, and to show how external events impinge on these developments. It may not be possible to construct timelines in the detail that skeptics would wish, but we would do well to make the attempt. In addition to helping forestall critical objections, timelines may disclose unnoticed dimensions of the cases. Many of James Leininger's statements were cued by things he saw or heard, suggesting the role of recognition memory in past-life recall (Matlock, 2022b, p. 112). With Rylann O'Bannion, a detailed timeline revealed how a gradually lessening trauma allowed memories to surface more freely, fully, and accurately (Matlock, 2019, pp. 22–30). Ohkado's (2022) table of developments in the case of Takeharu suggests that Takeharu's memories of dying with the sinking of the battleship *Yamato*, which had no model in his family or early environment, might have been triggered by phobic reactions to being surrounded by water in the bathtub.

Stevenson routinely tabulated a child's statements and behaviors, emphasizing their verification, but did not place them in timelines. Constructing at least a general timeline of events is an essential part of case investigations, because without it researchers cannot arrive at a satisfactory understanding of a case's development. It would be good if, in writing up reports, researchers would pass along this understanding to readers by combining Stevenson's table elements with a chronology of events, as Ohkado (2022) and I (Matlock, 2019, 2022b) have done.

Timelines in early-bird cases would make clear which of a subject's statements were made (a) before the inves-

tigation began, as distinct from (b), before the previous person was identified, and they would track (c), statements made after the identification but before the two families met for the first time and had opportunity to exchange information.¹² In cases such as the James Leininger case, timelines would also place in context (d) records that are recognized retrospectively to have documented past-life memory claims before the person to which they referred was known.

A related analytical technique is attributed to anthropologist David Read Barker by D. Scott Rogo (1985, p. 79). Barker worked with Stevenson in the late 1970s. According to Rogo, he found it useful to make separate tabulations of statements that a child could have learned by “normal” means from those which required some “paranormal” explanation. A variation would be to separate items of general knowledge from more recondite items. Ideally, the classifications would be done by someone blind to the verification status of the subject’s statements.

Theoretical Framework. Reincarnation currently holds a default position in explanatory models. We conclude that a previous life is the most likely basis of a subject’s memory claims and behaviors because alternative possibilities seem less tenable. Although this conclusion is logically defensible, it is not strongly persuasive. When we say that cases are suggestive of reincarnation, what exactly do we mean? Are we embracing notions of retributive karma, of past lives on other planets, of astral bodies between lives? These are tenets of the Theosophical conception, which, thanks to Edgar Cayce, has had a major influence on Western beliefs (Matlock, 2019).

Edwards (1996) presumes that reincarnation is universally understood according to Theosophical precepts, and hence “if Stevenson’s reports are evidence for reincarnation they must also be evidence for the collateral assumptions [derived from Theosophy] just mentioned” (p. 255). Clearly, Edwards has not read enough of Stevenson to realize that he rejects the Theosophical position because it is not supported by his case data. The only part of the Theosophical model Stevenson endorses—on theoretical grounds—is the astral body, which he terms a “psychophore” (Stevenson, 1997, 2001). The psychophore would act as a “template” for the new body (Stevenson, 1997, vol. 2, p. 2084); it would bear a deceased person’s “mental elements,” which would “act on the morphogenetic fields of an embryo or fetus” (Stevenson, 2001, pp. 234, 251).

I am not convinced that a discarnate mind requires a subtle body to maintain its coherence and if a discarnate mind can affect its new body (through psychokinesis), as

Stevenson posits, I do not see why it might not do so directly. In *Signs of Reincarnation* (Matlock, 2019), I suggest that what survives death and reincarnates is a stream of consciousness continuous with embodied life. A person’s memories, personality traits, behavioral dispositions, and so forth are carried in a subconscious stratum of his consciousness stream, I think. I conceive of reincarnation as possession of a body by a consciousness stream, bringing with it subconscious material as well as conscious awareness. Most of us never have memories of previous lives penetrate our conscious awareness, although under certain circumstances some of us apparently do. My theory requires acceptance of no new explanatory concepts or rejection of established findings in biology or other sciences.

Stevenson’s and my theories are not the only data-based models of reincarnation available. Keil (2010) proposes that reincarnation cases reflect “thought bundles” created at death and subsequently absorbed by young children.¹³ Andrade (2011) presents an elaborate theory, drawing on Brazilian Spiritist concepts. Other theories at least partially informed by data are framed by Paul Von Ward (2008) and Eric Weiss (2012). Whether we choose one of these models or another¹⁴ is less important than making our thinking clear. If we do not do so, we invite readers to imagine reincarnation on their own terms, potentially producing not only confusion, but rejection through misunderstanding, as with Edwards (1996).

Statistical Analysis

The large number of investigated reincarnation cases, both in files at the University and Virginia and in publicly available publications, allows for correlation and pattern analyses and for hypothesis testing.

Cross-Cultural Patterns. From the start of his investigations in the 1960s, Stevenson realized that he was learning about far too many cases to permit the in-depth study of all. He decided to concentrate on a few representative cases but collect basic data on others for pattern analyses. For several years, he provided statistical profiles of what he came to regard as key variables, such as the median length of the intermission between lives and the prevalence of cases with changes of sex, culminating in a comparison of ten cultures in a paper devoted principally to the Igbo of Nigeria (Stevenson, 1986).

The most striking cultural variation Stevenson discovered lies in the prevalence of sex-change cases. He did not hear of these cases in cultures that held sex change between lives to be impossible, although they came to his attention elsewhere. Skeptics (e.g., Augustine, 2015, p. 27) often tout this as evidence that the cases are so-

cially constructed, although they disregard the possibility of selection bias due to suppression of cases in places where sex-change is deemed impossible and overlook culture-linked patterns not so tightly anchored to beliefs, e.g., intermission length (Matlock, 2019, pp. 187–188). Skeptics also ignore universal or near-universal variables, such as the young age (2–3 years) at which children typically begin relating past-life memories and the tendency for the memories to fade by late childhood. Interestingly, some universal or near-universal patterns, e.g., those involving manner of death and age at death, are related to the previous person rather than the case subject (Matlock, 2017b; 2019, pp. 177–189). The latter patterns, in particular, are hard to reconcile with the motivated physicalist model.

Correlations Between Variables. Correlations between variables present even more of a challenge to the motivated physicalist model. A cross-cultural study by Narender Chadha and Stevenson found that children began to speak about previous lives earlier, and the intermission was shorter, in cases with violent as opposed to natural deaths (Chadha & Stevenson, 1988). Pehlivanova et al. (2018) showed that in sex-change cases, children frequently displayed cross-dressing or other gender-nonconforming behaviors, whereas in cases without a change of sex between lives, these behaviors were absent.

Iris Giesler-Petersen and I (Matlock & Giesler-Petersen, 2016) examined memories of the intermission period, revealing both commonalities and differences between Asian and Western cases. Although Asian and Western intermission memories are, in many respects, strikingly similar, Westerners most often describe the intermission as passing in “heaven,” whereas Asians usually depict it passing in a realistic terrestrial setting. Giesler-Petersen’s and my study is one of the few statistical studies conducted independently of the University of Virginia. In a recent paper (Matlock, 2022c), I reported that 32 (89%) of 36 published cases with intermissions of under nine months (i.e., the previous person died while gestation was under way) had congenital physical anomalies. This is surprising, given that Stevenson (1993, p. 404) says that birthmarks and birth defects appear in roughly 35% of the cases in his collection.¹⁵

Hypothesis Testing. The formulation and testing of hypotheses play important roles in the advancement of any science, but to date most pattern and correlation analyses in reincarnation research have been exploratory, not tied to formal hypotheses. An exception is the study of Schouten and Stevenson (1998), which sought to test the socio-psychological assumption that subjects acquired information about previous lives from interactions with persons of those lives by comparing cases with

written records made before the present and previous families had met with cases with records made after their first meeting.

An early paper of mine furnishes another example. In reading case reports, I noticed a tendency for past-life memories to arise in response to stimuli more often with older children and adults than with younger children and tested this association on the 95 published past-life memory accounts then available. My hypothesis was confirmed, both cross-culturally and with Indian cases alone (Matlock, 1989). As reincarnation research continues to mature, and a theory of the reincarnation process becomes established, I hope we will see more hypothesis testing.

CONCLUSION

In outlining improvements to the methodology and reporting of reincarnation cases, I’ve adopted several suggestions offered by critics and, in general, tried to address skeptical concerns. If implemented, these improvements should go some distance in diminishing the will to disbelieve and should make it easier to reach scientists and scholars open to this research. Here are the highlights of my recommendations:

- Researchers should continue to seek out and report cases with early-bird documentation. Although not immune to criticism, these cases effectively address issues of memory reliability.
- Investigations by local researchers, native to the cultures and languages in which the cases develop, are encouraged. Such investigations avoid the problematical aspects of reliance on interpreters.
- Researchers would do well to adopt a protocol in which different investigators or investigation teams work on the case subject’s and the previous person’s side of a case. Consideration should be given to including subject specialists and open-minded skeptics on research teams.
- The team investigating the previous person’s side should be blind to the memory claims of the case subject. To achieve this most effectively, the team might be furnished a list of statements, behaviors, and physical traits related to the identified previous person with decoy items mixed in.
- The same list might be assessed against a control child or children (matched in age and background) for comparison to the case subject. The control children could either be selected for investigation along with research on the previous person or be drawn from cases previously investigated.
- If the case is active, researchers on the subject’s

side should include objective measures, such as photo or object line-ups for controlled recognition experiments. Other types of experiments, involving planned reincarnation and cadaver marking, might be considered as well.

- Research should move beyond strictly proof-oriented concerns to consider process issues. Researchers should pay attention to psychological and sociological factors that might affect the case's development.

- Researchers should prepare reports for journal publication first and only later include them in books. Open access publications are ideal because of their visibility on the web. Reports in books can be more detailed and include follow-up information on the case subject.

- In writing up their cases, researchers should be attentive to process-related, not solely proof-related, issues. This includes reviewing the pertinent literature related to key case features.

- Write-ups should include tables outlining the case's development, not only lists of statements and behaviors, as has traditionally been done.

- If they believe that the case is best explained by reincarnation, authors should make clear what they mean by describing or referring to a theory of reincarnation.

NOTES

¹ The term "early-bird testimony" was introduced by Stephen Braude (2003, p. 182) to refer to cases in which a case subject's memory claims had been recorded, usually in writing, before the deceased person to which they referred was identified.

² More detail about these 12 items is given in Table 2 of Part 1 (Matlock, 2022b, pp. 114–115).

³ This passage is included, with some slight variation in wording, in Braude's Bigelow contest essay (2021a, pp. 31–32), where he labels it "the Problem of Investigative Intricacy."

⁴ Only 20 of these cases have been published (Matlock, 2021). The remainder of the 33 published early-bird cases were either reported after 2005 or are not included in the UVA case collection. Among the 33 published early-bird cases, 23 are Asian and 10 are Western.

⁵ Murray and Rea (2008, p. 277 n11) say it would "take us too far afield to discuss the problems in detail." Although earlier in their discussion of reincarnation (p. 275), they cite Edwards (1996), at this point they refer to a Further Reading section, which does not include Edwards (1996).

⁶ For more in-depth responses to critics, see Matlock (1990, pp. 239–255; 2018; 2019, pp. 102–108, 114–117; 2022d; 2023).

⁷ By "weakly developed" I mean a case with few statements or behaviors. An unsolved case is one in which it has not been possible to identify the previous life.

⁸ For more detailed explication of Angel's (2015) proposed experiment, see Matlock (2019, pp. 103–104).

⁹ For more extensive reflections on Edelman and Bernet (2007), see Matlock (2019, pp. 109–110).

¹⁰ I cannot take the space to deal with this complex case at greater length here. See Matlock (2019, pp. 211–213) for a more detailed treatment.

¹¹ Haraldsson published his cases first in journals and later collected them in a book (Haraldsson & Matlock, 2016).

¹² The distinction between (a) and (b) is emphasized by Sudduth (2021, 2022b); (c) is suggested by Nahm (this issue), citing Schouten & Stevenson (1998), who used this standard in their comparison of cases with and without prior written records.

¹³ For critiques of Keil's (2010) theory, see Nahm and Hasler (2011) and Matlock (2019).

¹⁴ It is possible also to acknowledge that the case data require a non-ordinary explanation without embracing reincarnation. Before I worked out the theory presented in *Signs of Reincarnation* (Matlock, 2019), I was agnostic on the question of whether the cases indicated reincarnation (1990, p. 255; 2011, pp. 808–809).

¹⁵ I did not check published reports of cases with intermissions longer than nine months, so cannot provide a figure for the prevalence of congenital anomalies in them.

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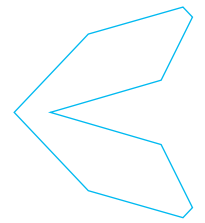
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COMMENTARY

Editor's Preface to the Commentary Section

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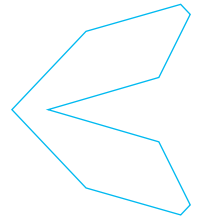


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This section contains further exchange about the evidence and outcomes from the 2021 Bigelow Institute of Consciousness Studies (BICS) essay contest on postmortem survival. As noted in the Introduction to the Summer issue's Special Subsection on BICS (pp. 348–349), heated debates are certainly expected with controversial topics. But exchanges should remain constructive by focusing on cool analysis that aids in arriving at the most appropriate conclusions (see, e.g., Tkotz, J., et al. [2021]. Keep calm in heated debates: How people perceive different styles of discourse in a scientific debate. *Frontiers in Education*, 5, Article 572503. <https://doi.org/10.3389/feduc.2020.572503>).

Ad nauseum arguments over competing interpretations of current information are neither useful nor the way forward in this domain. Thus, the *Journal* will not publish further commentaries related to the Special Subsection on BICS but instead only consider conceptual or empirical contributions that substantively advance the conversation. The Editorial team encourages researchers of different ideologies and expertise to engage directly with each other and pursue meaningful discussions, if not collaborations, on new methods, data, and analysis. To my way of thinking, this outcome would constitute the single most important legacy of the BICS essay contest.





COMMENTARY

A Guardian Angel Gone Astray: How Not to Engage in Scientific Debates

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HIGHLIGHTS

A previous critique of key aspects of an award-winning essay on postmortem survival arguably failed to meet the standards of objectivity, impartiality, and scientific responsibility required in academic debates.

ABSTRACT

In a recent commentary on an essay competition regarding the best evidence for the survival of human consciousness, Keith Augustine prominently criticized the award-winning essay I submitted to this competition. As demonstrated in the present article, Augustine's critique is specious as evidenced by specifically two aspects of it: 1) On multiple occasions, Augustine misrepresented contents of my essay by attributing statements to me I never made and by presenting quotes out of context and contorting their original meaning. Due to Augustine's misrepresentations of my essay's content, it is unavoidable to conclude that his entire commentary is permeated by biased reasoning. 2) Although Augustine caviled at numerous formulations he drew from all over my essay, he did not mention that I singled his work out for profound criticism on numerous pages of my essay. He did not even attempt to counter my critique of his arguments on factual grounds. In conclusion, Augustine's commentary is a good example of a bad contribution to the survival debate.

KEYWORDS

Misrepresentation and suppression of content; misinformation; quoting out of context; reincarnation cases; survival of consciousness

The summer issue of this journal contained a special section about the Bigelow Institute of Consciousness Studies (BICS) essay competition regarding the best evidence for human survival. It featured a lengthy commentary by Keith Augustine (2022a) on chiefly eight selected essays, a response to Augustine by a team of authors (Braude et al., 2022), and a lengthy final reply by Augustine (2022b). After I learned that Augustine selected my essay for this competition (Nahm, 2021) along with that of Delorme et al. (2021) for most prominent critique of all 29 award-winning essays in his commentary, I became intrigued. Of all prized BICS contestants, I was the only one who explicitly criticized Augustine's writings, specifically his explanatory model for cases of the reincarnation type (CORT).¹ Hence, I wondered how he responded to my criticism. But reading his commentary turned out to be disappointing for three reasons. First, Augustine barely responded to my factual critique of his explanatory model for CORT but rather quibbled with numerous statements he drew from all over my essay. He did not even mention that I singled out his work for pages-long critique. Second, I became increasingly surprised when noticing that Augustine, a fervid skeptic who styled himself as a guardian angel of objectivity, impartiality, honesty, and scientific integrity in his commentary, contorted contents of my essay on multiple occasions in always the same decrying spirit, misleading his readers by attribut-



ing statements to me that I never made. Third, the basics of the arguments Augustine advanced in his critique, but also of counter-arguments, were already familiar to me from the literature (e.g., Augustine, 2016; Martin & Augustine, 2015a; Matlock, 2016a, 2016b). Now, he merely applied his usual way of arguing to the essay contest, and it seemed as if he rated all essays he considered as equally nonsensical and reprehensible. Overall, I barely learned anything new. I would have liked to see a more nuanced, comparative, and structured critique of the essays, evaluating for example differences in their methodological approaches, the rationales behind them, some of their strengths and weaknesses, etc. Apart from that, I often found Augustine's arguments inapt, and I largely concur with Braude et al.'s (2022) appraisal of his commentary. But because Augustine (2022b) found their arguments likewise inapt, it is very likely that the debate which covered already 57 (!) pages by Augustine (2022a, 2022b) plus 13 pages by Braude et al. (2022) would merely continue in the same vein in case I would now explain why I consider his arguments inapt. We would simply continue to explicate why we continue to disagree, which would not produce much of noteworthy value in addition to what has already been said. Therefore, and also because of space limitation, I spare the readers an analogous loop of mutual disagreement but will chiefly highlight another level of Augustine's commentary that has not yet received the attention it deserves: I demonstrate how on several occasions he disseminated misrepresentative notions concerning statements he criticized. This conduct is objectively verifiable and therefore not a matter of mere disagreement. Moreover, it raises serious concerns from a superordinate perspective about the overall manner in which he seems to devise his arguments.

Braude et al. (2022) have apparently made similar observations, blaming Augustine for straw-man reasoning such as charging survivalists with positions they do not hold (p. 409). To my amazement, Augustine responded to them with this bold challenge: "Find just one direct quotation of a single instance where I explicitly attributed a position to a BICS essay contest winner that the winner did not advocate. Otherwise, mind your accusations" (2022b, p. 430). Because it is very easy to find such examples in Augustine's commentary, and because it is generally worthwhile to be aware of the methods that can be used to create devaluing distortions and fictions concerning a treatise under examination, I present a selection of seven examples that show how Augustine proceeded in misrepresenting contents of my essay. I furthermore highlight why such practices are not only egregious per se, but also point to a much deeper problem for scientific debates. In the second part of this paper, I pick up some lines of critique of Augustine's work I advanced in my BICS essay. However, in order

to optimally understand the meaning and context of the following sections, I strongly recommend that readers of this article read my BICS essay as well, and then carefully compare its content with the critique Augustine offered against it.

PART 1: THE ART OF MISLEADING READERS. SEVEN EXAMPLES FROM PRACTICE

Example 1: Attributing a position to an author on grounds of a gross misunderstanding and discrediting the author on these grounds.

I begin with an example that illustrates how Augustine constructed an alleged discrepancy between two formulations contained in my essay, misinterpreting what I wrote in a remarkable way. On page 391 of his article, Augustine wrote:

Nahm also invokes a double standard, writing of the dependence thesis, "it is impossible to prove it from a purely logical perspective," even though, incredibly, he had just written "we usually don't speak of 'proof' in sciences like psychical research" (2021, p. 66). What justifies Nahm raising the bar for neuroscientific evidence while lowering it for evidence from psychical research?

There is no double standard and also nothing incredible here—apart from Augustine's failure to notice that I wrote very obviously about proof *in a negative sense on both occasions*. In paraphrase, they convey the following meanings:

- 1) We cannot prove from a logical perspective that brain chemistry produces consciousness, which is why even many modern neuroscientists speak of "neuronal correlates" to conscious experience (Nahm, 2021, pp. 3, 66) (Note: I wrote specifically about the *production hypothesis* but not about a more general "dependence thesis" as Augustine mistakenly claimed).
- 2) We usually do not speak of proof in sciences like psychical research because the concept of proof is generally problematic in this field.

The reason why these two statements are perfectly accordant is simple: In contrast to for instance mathematics, one should principally not speak of obtaining proof in natural sciences including psychical research *and* neuroscience because it is virtually impossible to obtain 100% "proof" for something in these areas from a logical perspective. In case there should be any doubt about my position, I quote from an email I sent to the BICS staff on June 28, 2021, after

I was informed that I have to frame my essay explicitly in context of the legal concept of “proof beyond a reasonable doubt”—a requirement that I was (and am) not too happy with.

I suppose it would be difficult to deal with such legal requirements properly because it is not clear what exactly “proof beyond a reasonable doubt” is even in court, and also because “proof” is a concept generally avoided in the [natural] sciences. The term usually used is ‘evidence.’

Example 2: Misleading readers by attributing statements to authors they have never made, simple version.

On page 381 of his article, Augustine claimed in an apparent attempt to discredit near-death experiences (NDEs) that I would have “conceded” that “cross-cultural comparisons of NDE reports [. . .] are characterized by more differences than similarities (Nahm, 2021, p. 18).” I have not “conceded” anything like that in my essay, let alone on page 18. Rather, I wrote on page 14: “Although they are marked by cultural influence, NDEs share a common core structure featuring several elements.” Evidently, I highlight the contrary here, namely that NDEs share overall communalities *despite* their being culturally influenced.

Example 3: Misleading readers by attributing statements to authors they have never made, inflated version.

On page 379 of his article, Augustine claimed two times that I deemed the CORT of James Leininger to be the “second best” before-case in my essay (before-cases refer to cases in which a child’s statements about a previous life were documented *before* a previous personality that matched these statement has been identified).² The rationale behind Augustine’s particular emphasis on Leininger’s case is obvious: He believes—mistakenly—that it has been debunked by Michael Sudduth (2021; but see Matlock, 2022a, 2022b). Hence, stressing repeatedly that I considered the allegedly flawed Leininger case to be the “second best” will evidently cause correspondingly great damage to my arguments in favour of this case—and of CORT as a whole.

However, I have not stated anywhere that I deemed Leininger’s case to be the “second best” before-case. Contrarily, I treated it only very casually. In the main text of my essay, I referred to it exactly *once* (p. 26): “Further well-documented American before-cases are those of James Leininger and Rylann O’Bannion.” Then, there is a four-line footnote that provides additional information and references to these two cases. Finally, the case is in-

cluded in Table 2 in which I listed 15 important before-cases. The reason why Augustine claimed repeatedly that I considered Leininger’s case the “second best” before-case is that it is found in the second line of Table 2, after the case of Ryan Hammons. It is beyond my comprehension how somebody can regard the order of the cases in Table 2—and consequently, also in the subsequent Table 3?—as a ranking of the “best cases.” The most striking aspect of the two Tables’ arrangement of cases is that they are primarily and visibly sorted according to geographical regions and countries. Why, for example, should I consider Leininger’s case, which I characterized as an “impressive” case in Table 2 (line 2) and mentioned just once and casually in my essay, and the case of Rylann O’Bannion (line 3) which I likewise mentioned only once and casually (see above), to be “better” than the “exceptionally well-documented” case of Gnanatilleka Baddewithana (line 5), which I introduced and summarized very prominently on pages 26 and 27, and the significance of which I highlighted on two additional occasions?

Example 4: Misleading readers by attributing statements to authors they have never made, plus utilizing this claim several times.

On page 380 of his article, Augustine wrote:

Survival researchers can easily sift through some data, find some patterns, and then retroactively declare these patterns to be “predictions” of the reincarnation hypothesis. But are they really its predictions? [. . .] To be a genuine prediction, a particular item has to be derived from a hypothesis in some way. [. . .] If one cannot do that, then there’s no reason to call a particular outcome a prediction of a hypothesis. Anyone can just mold a hypothesis to fit whatever data one has at hand, in what philosophers of science deride as accommodation rather than hypothesis-derived prediction. Nahm’s reincarnation hypothesis “predictions” are paradigm cases of accommodation.

Thereafter, Augustine added a critique about what is wrong with some of my “predictions” (see also Augustine, 2022b, p. 422). But “survival researcher” Nahm did not “call” or “declare” anything to be a “prediction” in the context Augustine referred to. It was Augustine alone who retroactively declared some aspects of my introductory overview of empirical findings concerning CORT to be “predictions.” Because he did not inform his readers about his move, they are led to erroneously believe that I used this prominent scientific catchword inappropriately on sever-

al occasions. In reality, I perfectly agree with Augustine: What he declared to be Nahm's "predictions" are no predictions at all—albeit for very different reasons than those he offered.

Example 5: Misleading readers by quoting an author selectively and out of context.

On page 372 of his article, Augustine wrote:

To say that dependence thesis proponents "regard survival 'impossible' in an aprioristic way" (Nahm, 2021, p. 66) merely attacks a straw-man.

Again, what I "said" was actually something quite different: "Impartial court members [. . .] would not regard survival 'impossible' in an aprioristic way." This statement harkens back to my essay's beginning in which I introduced three guiding principles for the adequate study of psi phenomena suggested by Hans Driesch, the first being "Do not regard any fact 'impossible' in an aprioristic way" (Nahm, 2021, p. 4). Although I do hold the opinion that some "dependence thesis proponents" are heavily prejudiced and some have in fact declared survival to be impossible in an aprioristic way (e.g., Vollmer, 2017), I nowhere proclaimed the sweeping generalization "dependence thesis proponents regard survival impossible in an aprioristic way" in my essay. Perhaps, Augustine inferred that I intended to proclaim this allegation. But selling inferences for facts when quoting selectively from an author, thereby attributing statements to them they did not make, is misplaced in scientific debates.

Example 6: Misleading readers by quoting an author selectively and out of context.

This example concerns a section of my essay in which I evaluated the evidential strength of 10 different survival phenomena including mental mediumship. Overall, I rated the evidential value of mental mediumship rather high, only CORT attained a higher score (Nahm, 2021, p. 20). With regard to my evaluation of mental mediumship, Augustine emphasized an alleged inconsistency in my arguments:

Given the weight that both [Delorme et al. (2021)] and Nahm give to historical trance mediumship, readers may be surprised to read Nahm's overall assessment: [. . .] "The qualitative strength of mental mediumship cannot be regarded as 'high.'" (Augustine, 2022a, p. 378).

First, it is wrong that the quote Augustine selected concerned my "overall assessment" of mental mediumship. Rather, I evaluated five different criteria of survival phenomena separately, their *qualitative strength* being one of them. It is the sum of these five criteria that represents my overall evaluation of a given survival phenomenon. Augustine selected a quote that only referred to the qualitative strength of mental mediumship, and by claiming it would represent my "overall assessment" he put it into a false and inflated context.

Second, my statement that the qualitative strength of mental mediumship cannot be regarded as "high" does not mean that it is "low," as readers will erroneously infer from reading Augustine's selected quote and from his additional creation of an alleged "contrast" (ibid., p. 378) to the evaluation of Delorme et al. (2021) who assigned the evidential value of mental mediumship a relatively high grade. But just like these authors, who rated mental mediumship "good" albeit not "strong" (their maximum grade), I rated the qualitative strength of mental mediumship "relatively high" albeit not "high" (my maximum grade). We even did that for pretty much the same reasons. The "contrast" Augustine constructed via quoting misleadingly from my essay does not exist.

Example 7: Misleading readers by suppressing relevant information, plus quoting an author selectively and out of context, plus using drastic language to simulate authority.

On page 392 of his article, Augustine complained that I performed an "inexcusable conflation" of the two terms living-agent psi (LAP) and super-psi, buttressing his claim by using the following quote from my essay: "The living-agent psi model is also called the 'super-psi' model."

To begin with, Augustine conspicuously omitted the beginning of the sentence in the quote above, thereby concealing that this quote explicitly referred to history and tradition: "Traditionally, the living-agent psi model is also called the 'super-psi' model" (Nahm, 2021, p. 49, emphasis added). To check if this statement implies an "inexcusable conflation" of the two terms, it is instructive to read writings of Michael Sudduth and Stephen Braude, the authors who published the most important treatises on super-psi and LAP.

In one of his earlier publications, Sudduth commented on "living agent psychic functioning, *the so-called Super-ESP hypothesis*" (Sudduth, 2009a, p. 399; emphasis added) and termed his first major publication on this matter "a defense of the super-psi hypothesis" (ibid., p. 401). In this treatise on LAP, Sudduth explained that "advocates of the super-psi hypothesis contend that [evidence for survival] may be at least equally explicable in terms of living agent psi as by

personal survival” (Sudduth, 2009b, p. 168). He also maintained that “the term ‘super-psi’ is laden with unwanted and misleading connotations” but stressed that he will nevertheless “follow the *traditional terminology*” for much of his paper (ibid., emphasis added). Similarly, Braude stated that the position according to which survival phenomena could be explained by “psychic functioning among the living [. . .] is often, but unfortunately, called the super-psi hypothesis” (Braude, 2013, p. 26).

Hence, from a tradition- and terminology-oriented perspective, my opening sentence on LAP is obviously correct as evidenced by the quoted statements. More could be added. Conceptually, however, I am well aware that especially Sudduth’s theorizing regarding LAP has increasingly departed from the earlier theories on super-psi. In this respect, I am thankful to Augustine for making me aware that I did not distinguish properly between tradition and terminology on one hand and conceptual advancements on the other hand. But regardless of that, I have *not* conflated the contemporary concepts of super-psi and LAP. By contrast: I explicitly defined how I *distinguished* and used both terms in my essay:

[The term “super-psi”] points to the fact that psi of an enormous quality and quantity is required to explain all facets of survival phenomena. In my definition, it is a quantitative attribution that denotes a difference in psi degree, not one in nature, similar to distinguishing “stars” from the rarer but more impressive “super-stars” in show business. The related term “living-agent psi” is a qualitative attribution similar to saying that a star or super-star can be a “music star” or a “movie star.” It stresses that the psi or super-psi required must be attributed to living beings but not to deceased agents. (Nahm, 2021, pp. 49f)³

Augustine suppressed my explicit differentiation of the two terms completely. Worse: He actually quoted from it—but again in a selective manner that not only concealed the differentiation itself but additionally contorted my statements. Insinuating that I referred to a super-psi-inclusive version of LAP, he quoted only a small excerpt of the differentiation cited above, namely: “This term points to the fact that psi of an enormous quality and quantity is required to explain all facets of survival phenomena,” and he built several lines of critique on this quote. He even stressed that “Sudduth’s neutral term LAP doesn’t imply anything about how ‘much’ psi [. . .] is required to explain the survival evidence” (Augustine, 2022a, p. 393). But as anybody can read above (and in my essay), this is exactly how I characterized and used the concept of LAP as well.

Hence, the arguments that Augustine advanced against my essay on the basis of my alleged “conflation” of the terms super-psi and LAP are once again pointless—apart from their demonstrating how somebody can construct a seemingly powerful but fictitious straw-man using a few trivial tricks: 1) Suppress the presence of important information contained in a text and claim that it is in fact conspicuously lacking, 2) select a quote, pull it out of context, and contort its original meaning to use it as a substantiation of your wrong claim, 3) use drastic formulations such as “inexcusable” to raise the impression that the criticized author was misbehaving in a very evident and stupid way—because otherwise, one would not be daring to use such drastic formulations.⁴

CONCLUSIONS FROM PART 1

Straw-men eternalized in print can be exposed via pertinent examination. But unfortunately, authors who fabricate them will nevertheless get away with them all too often. Most readers simply have no time and desire to double-check every claim authors make, especially if they come in the disguise of knowledge and authority. Speaking from my experience, however, I found that publications written in a cynical, scornful, holier-than-thou style gushing with quasi-religious zeal and preachy emphasis on the importance of true science are likely to contain distortions and fictions. Hence, it is worthwhile to keep in mind that publications written in such a style deserve a particularly critical read.

Although such conduct is interesting from a psychological perspective, these distortions and fictions are rather troublesome for scientific debates. In addition to merely disseminating misinformation that is often difficult to erase again from the literature, they point to a much deeper problem: Given that authors misrepresent the work of their interlocutors on multiple occasions in the spirit of a denigrating and devaluing agenda, be it consciously or unconsciously—are we entitled to believe that their lines of reasoning are objective and impartial even where they do not misrepresent the material they discuss? I strongly doubt that. Rather, I maintain that authors who habitually misrepresent the work of their interlocutors decryingly in discussions about a controversial topic of their personal interest will principally behave in a biased manner when they choose and evaluate sources to design their arguments. Regarding Augustine, I perfectly agree with Braude et al. (2022) and previous critics of his work who already demonstrated earlier that his manner of arguing is selective and biased indeed (Greyson, 2007a, 2007b; Holden, 2007; Matlock, 2016a, 2016b; Ring, 2007). Moreover, given such authors are evidently unaware of their easily demon-

strable misrepresentations of content according to their bias (“find just one instance,” “mind your accusations”), they are very likely even less aware of their more covert biased practices. They will indignantly disavow pertinent critique and simply continue their blind flight with reinforced verve (e.g., Augustine, 2022b). An advancement of a scientific debate is impossible under such conditions. Regarding the debate on CORT, the main topic of my BICS essay, this deplorable state of affairs is particularly striking. The comparably small amount of literature on CORT that has been published by survival-critics who reject LAP contains a disconcerting amount of scorn, sweeping generalizations, and misinformation (for references to some examples, see my essay), thus revealing that the authors of these publications were anything but well-informed, objective, and impartial.⁵

PART2: THE DRONE OF SILENCE

In the previous section, I showed that what Augustine wrote in his lengthy commentary contains clear evidence of misrepresentation of my essay’s contents and fallacies. It does not meet the standards of scientific debates. In this section, I show that what Augustine kept silent about substantiates this notion from another angle. On pages 37 to 49 of my essay, I prominently criticized the explanatory model for CORT according to which all facets of a case can be explained via mundane means, such as parental coaching, misremembering, misinterpretation, and fraud. Survival and LAP explanations are both rejected in this model. Augustine, a physicalist who maintains not only that mind is positively caused by brain activity but who additionally advocates the peculiar stance according to which all mental processes are brain processes and that the mind is the nervous system (Augustine & Fishman, 2015), is a vigorous proponent of this model (Augustine, 2015).

After an introduction, I listed the various means that Augustine considered to be sufficient for a mundane explanation for CORT. Then, I argued that this model would not apply to strong before-cases, explicitly giving the cases of American Ryan Hammons and Sri Lankan Gnanatilleka Baddewithana as examples (pp. 40f). In his commentary, Augustine (2022a, pp. 380, 392) objected by simply claiming that “normal/conventional sources of information for ostensibly anomalous knowledge” would have been present in before-cases, thereby alleging that the reports of all before-cases are seriously flawed. Effectively, he just re-invoked the supposition I have termed the “somewhere-somewhat conjecture” in my essay already. According to this supposition, all CORT *must* be flawed somewhere, somehow; and this supposition is then sold as an explanation for them. I elaborated why this con-

jecture lacks a scientific rationale and is also insufficient to account for the documented phenomenology of CORT on factual grounds. But rather than taking the opportunity to respond to my charges on factual grounds as well, Augustine stayed silent about the cases of Ryan and Gnanatilleka but merely replayed his somewhere-somewhat conjecture as if nothing had happened. Moreover, as argued already, he preferred to quibble with all sorts of other issues in his commentary while simultaneously remaining suspiciously quiet about my pages-long explicit critique of his writings. Evidently, withholding significant information from readers merely by staying silent about it also belongs to the established means by which they can be influenced according to someone’s agenda. Additionally, Augustine did not even provide a reference to a source that would support his allegation according to which all before-case reports are decidedly flawed. Undoubtedly, he thought about the case of James Leininger as one such example. But this case is unsuited to support his claim (Matlock, 2022a, 2022b). Therefore, I reiterate: Sweeping generalizations without foundation do not qualify as scientific arguments. Rather, they represent paradigm examples of diversionary tactics and immunization strategies, i.e., strategies employed to keep the debate on a very general and seemingly inviolable level, thereby avoiding entering a discussion about crucial practice-related minutiae. But we need something with more substance. Given Augustine’s suppositions are true: Where exactly did the parental coaching, misinterpretation, misreporting, or cheating enter the reports about Ryan and Gnanatilleka’s cases? What is the flaw that renders them untenable?

Augustine (2022a, p. 380) used the same sweeping generalization, namely claiming that conventional sources of information for ostensibly anomalous knowledge have been present in before-cases, also to refute the results of a study I introduced in my essay. Its authors compared the mean percentage of correct statements and the overall number of statements recorded in 21 before-cases to those recorded in 82 “after-cases”, i.e. cases in which the statements were recorded only *after* the families of the subjects and previous personalities had met and interacted with each other (Schouten & Stevenson, 1998). The study showed that these before-cases and after-cases yielded almost equal percentages of correct statements, and that the overall number of statements was even significantly higher in before-cases. For reasons outlined in the original study and my essay, both results contradict what one should expect from the perspective of Augustine’s model. Interestingly, Augustine’s repudiation of these results by simply invoking the presence of conventional sources of information in before-cases implies that the before-cases Schouten and Stevenson considered contained *at least* as

much misremembering, misreporting, and/or deceit as the after-cases they considered. This implication stands in contrast to common sense and the notion held by the majority of scientists who are in general agreement that for obvious reasons, misreporting and misremembering are more difficult and unlikely to occur in before-cases—hence their widely recognized importance and scientific desirability (e.g., Matlock, 2021, 2022b). To date, nobody has even tried to demonstrate that many let alone all before-cases are flawed.⁶

Augustine's attempt to counter two of my numerous arguments against his explanatory model for CORT by simply repeating the same somewhere-somewhat conjecture I already demonstrated to be deficient in my essay, is virtually everything that he had to offer in defense. His refusal to enter a data-driven debate comes close to the claim according to which data suggestive of psi are "irrelevant" and need to be disregarded when forming the correct opinion about our world (Reber & Alcock, 2019). This stance has already been noted to be symptomatic of the egregious state of some prominent forms of current skepticism (Nahm, 2020; Roe, 2019). Concerning my arguments against his explanation for CORT, at least, the verbosity and cynicism of Augustine's commentary merely represent the drone of silence.⁷

In the following, I introduce a few selected aspects of the arguments that Augustine did not address. Space limitation precludes a more detailed exposition of the fascinating and multifaceted phenomenology of CORT and of many more arguments that challenge his model, so I need to refer interested readers to my essay.

To begin with, it is obvious that adults who initiate the purposeful or unwitting creation of a contrived CORT for the mentioned motives should make sure that the identity of the previous personality whose past life a child speaks about can be readily identified. The easiest way to ensure this identification consists of providing personal names of the previous personalities and/or of their family members to enable people to "solve" the case. However, this is often not the case. Consequently, some CORT can only be solved after years, if at all. Many remain permanently unsolved despite substantial efforts to identify the deceased individual in question. In this context, Sri Lanka is of particular interest. When comparing countries where children provide similar average amounts of information about their supposed past lives, children provide personal names more rarely in Sri Lanka. Also, Sri Lankan Gnanatilleka did not provide names of her claimed previous family. Consequently, an unusually high proportion of 76% of Sri Lankan CORT remained unsolved in Stevenson's files (Stevenson, 1977). Such a high share of unsolved cases is clearly not in line with what must be expected from Augustine's model.

Why should all these people take the trouble to construct artificial CORT to improve their social or financial status, and then omit, of all things, the most relevant trivialities, but still keep their construct alive for years and wait in vain for the expected profits—and this specifically in Sri Lanka?⁸ The survival model offers a smooth explanation for this curious lack of providing names in Sri Lankan CORT: When Stevenson conducted his investigations, people who lived there avoided using personal names as much as possible for traditional reasons. In contrast to other countries, they almost had a national phobia about calling anyone by their given names, even among spouses. Therefore, it would be understandable if words which were rarely spoken or heard in a past life, and concepts which had in effect strongly been avoided, might not rank high among items remembered or spoken of by Sri Lankan CORT subjects.

Other data challenge Augustine's model more directly. For example, a study in which numerous features of CORT have been correlated has shown the following (Tucker, 2000):

- There was no correlation between the strength of a case and the social status and caste of the subjects. This counters the supposition that CORT would preferably be created in poor families to increase their financial or social status.
- There was no correlation between the strength of a case and the reaction of the subject's parents to their children's claims. This is inconsistent with the supposition that the parents stimulate and encourage the creation of CORT.

The emotions displayed by the young subjects in CORT also constitute an important feature. Many who were able to engage personally with these children became convinced that they just cannot be the result of fantasies or parental coaching (for examples, see my essay). This concerns emotions that may shake the little ones when they talk about their presumed death in the past life, which was often violent and unpleasant. It also concerns negative emotions when they desperately long to see members of their supposed previous family but cannot do so for months and maybe years, but also overt joy, relief, and sadness when they finally meet and recognize them. Take the case of Gnanatilleka again, of which I included two photographs in my essay. They showed how she reacted at age four when she first met members of what she claimed to be her previous family. From a safe distance at a desk, all this may seem pretty unimpressive. Does Augustine say that Gnanatilleka was coached to behave in this way (by whom, when, and where?), or that the entire investigation and the photographs were staged (by whom, and how)? Because Augustine did not address such vital and prac-

tice-related questions, and did not even attempt to counter my arguments against his explanation for CORT on factual grounds, I can simply repeat my essay's conclusion regarding his model (Nahm, 2021, p. 48):

Regarding the better-documented cases, an explanatory model that ultimately needs to resort to postulating numerous years-long, fraudulent, water-tight conspiracies by entire extended families plus various neighbors, villagers, strangers, and perhaps even researchers—and all this without being able to show solid positive evidence supporting this notion, and in the light of several failed predictions of its background hypothesis whilst simultaneously ignoring all counter-evidence—is modest at best.

PART 3: CONCLUDING COMMENTS

First, I briefly comment on subjective personal experiences. In typical scientific contexts, they cannot be considered to constitute objective evidence for obvious reasons. Hence, I would like to stress that I do *not* advance the following considerations as a scientific argument but only as a personal comment. I add it because occasionally it is useful to remember that we are dealing with personal experiences when we address the questions about whether aspects of the mind can function independently of a brain or if there is life after death. This obviously differs from addressing the question about whether there is life on Mars. I alluded to the significance of personal experiences for oneself already in my essay. I stated that in contrast to the mainstream notion, CORT subjects and witnesses deeply involved in CORT might regard the physicalist hypothesis according to which consciousness is produced by the brain to be an as-yet-unwarranted hypothesis (Nahm, 2021, p. 66). In my life, I have had a number of experiences that I can solely explain in terms of psi, and I also had one time-anchored experience of dual awareness that I can only explain in terms of the supposition that one part of my mind operated independently of my brain—even though I am perfectly aware of all the evidence for the “dependence thesis,” the dangers of misinterpreting such experiences, etc. In each case, these experiences were very plain and simple—not of the kinds that are complex and difficult to interpret, such as alien abductions or fleeting apparitions in twilight. I also know that countless people, ranging from intimate family members and friends to strangers, have reported very similar experiences (for an overview on the prevalence of exceptional experiences in different countries, see Schmied-Knittel, 2015). Therefore, reading theoretical treatises by people who insist that the

experiences I had are “impossible” (Reber & Alcock, 2019) or that my interpretations of them must be wrong is often perplexing and sometimes even amusing; and pretty much the same applies to theoretical elaborations in which authors explicate how proper “probabilities” for the mind/brain-dependence must be gauged (Augustine, 2022a, 2022b; Augustine & Fishman, 2015; see also Nahm, 2021, p. 59). I know that I speak for very many people including scientists when I say: For those who have solid first-hand experiences demonstrating the contrary, such authors are simply not on a level playing field. They do not know what they are talking about.

Coming to a close now, I look forward to reading Augustine's reply, wondering if it will match my expectations regarding its content and tone. Contemplating his multiple misrepresentations of my essay, it occurred to me that it is occasionally likewise useful to remember that from the perspective of the physicalists' “world of natural science in all its mechanistic glory,” we are causally closed entities consisting of only “flesh, blood, atoms, and molecules” (Reber & Alcock, 2019, p. 10), or using Augustine's more refined words: Mental processes are actually brain processes. It follows logically that there is no free will and that 1) we never had any chance to act differently than how we acted in the past and that 2) our futures are likewise fixed already except for quantum events we cannot influence (Hossenfelder, 2022; Vollmer, 2017). These deductions are consequential. Thus, I often marvel at physicalist skeptics who *constantly treat parapsychologists and survival researchers as if they had a free will*, blaming them of having performed pseudoscience, cherry-picking, and other “inexcusable” misconduct, complaining they should have known better, behaved differently, and thought more rationally—as if the molecules constituting their deterministically operating brain matter ever had the slightest choice of having processed the physicochemical stimuli they received in any other way—and especially: more “rationally”! According to physicalist logic, causally closed brains cannot behave differently than they do. Hence, the mental by-products of survival researchers' deterministic brain processes just *cannot* be blamed for anything. Mind your accusations, please!⁹ But after all, the mental accessories of physicalists' brains can also not be blamed for what they had to write and for what they will have to write—this may alleviate brooding about the reasons underpinning such unheeding paradoxical reasoning and systematic misrepresentations of other people's work. Say what you will: Physicalism is an astonishing world view. In all its mechanistic glory.

NOTES

¹ In two of the other 28 award-winning essays, a book Augustine co-edited (Martin & Augustine, 2015a) was mentioned in passing (Rocha et al., 2021; Roe et al., 2021).

² The literature on CORT is not consistent as to how before-cases should exactly be defined. Much in agreement with Michael Sudduth (2021, p. 1011f), I suggest that in the future one should distinguish between two subtypes of before-cases: “Pre-investigation” and “pre-identification” cases. The first category refers to cases in which statements were recorded before the investigation to find a previous personality even began. The second category refers to cases in which statements were recorded during the investigation but still before the identification of the previous personality was accomplished. The first category represents the ideal before-case. But in practice, some cases will involve recording statements during the investigation. When both types of statements occurred in a given case, one should list pre-investigation and pre-identification statements separately. One could even distinguish a third type of statements, namely statements recorded after the identification of the previous personality, but before members of the two concerned families met for the first time (c.f. Schouten & Stevenson, 1998). But the latter statements would not pertain to the proper “before-case” aspect of CORT. The criterion for before-cases should best be defined as the existence of statements recorded before the identification of the previous personality was accomplished and confirmed.

³ The formulations I chose for this differentiation imply that I have absolutely no problem with the term and concept of super-psi. I perfectly agree that in the context of survival discussions, one should posit theoretically that living agents can possess enormous psi abilities. But I consider the complexity, qualitative and motivational aspects, theoretical ramifications, and what I called meta-evidence, to be more decisive for survival theorizing than the sheer amount of psi required to explain survival phenomena. Furthermore, I am in perfect agreement with those who maintain that the purportedly deceased must possess (super-) psi faculties that are at least equal to those of the living. In fact, given that the deceased who affect our world would have to operate from a non-physical beyond, everything they do or communicate would have to be framed in terms of psi. I consider this to be a triviality and therefore seconded Hans Driesch’s proposition in my essay according to which the means of communication that would appear “paranormal” to the living would be “normal” for the deceased (Nahm, 2021, p. 64).

⁴ Augustine’s conduct is particularly remarkable because he boldly announced in his commentary that he will call

out “bad behavior” and “poor reasoning.” As an example of such bad behavior, he declared cherry-picking to be “inexcusable” and a hallmark of “pseudoscience.” Since his own habit of constructing arguments by systematically misrepresenting text and attributing denigrating fictions to those he criticized is clearly much worse than mere cherry-picking, I wonder: Applying his very own standards, which vocabulary would he have to use for characterizing his own manner of engaging in this debate, then?

⁵ I cannot resist introducing one example that shows how Augustine subtly but grossly misled his readers about CORT already in the past. Much in line with other fierce critics of Ian Stevenson’s work who nevertheless seemed to be painfully ignorant of even most basic facts about what Stevenson had actually written and published, Augustine claimed as late as 2015 and 2016 that a critical assessment of CORT research authored by Champe Ransom in 1972 would have been written for the “late” Stevenson (Martin & Augustine, 2015b, p. 571; Augustine, 2016, p. 205). When Ransom wrote his report in November 1972, he was a research assistant of Stevenson who had just turned 54 years old. Stevenson died in 2007 and published virtually all his important treatises on CORT after 1972: The revised and enlarged second edition of his first book on CORT, seven further books about CORT, and dozens of articles in scientific journals. It is frankly absurd to state that Ransom’s addressee was the “late” Stevenson. The latter replied to Ransom after he received his report, and during the 34 years that followed until his last publication on CORT, he had plenty of time to consider aspects of Ransom’s critique he might have regarded justified. However, claiming that Ransom’s report was written for the “late” Stevenson obviously suggests that 1) during most parts of his research career as an investigator of CORT, Stevenson was unaware of important critical aspects of his work that were only “uncovered” (Martin & Augustine, 2015b, p. 571) by a late assistant of his, and that 2) Ransom’s critique therefore concerned most of Stevenson’s published work. But rather than damning Stevenson’s lifework, as Augustine’s readers are led to believe by his use of the seemingly inconspicuous word “late,” the critique of Ransom, who has not even once accompanied Stevenson in his field studies, concerned only the first phase of Stevenson’s investigations of CORT and his write-up of the reports. Be that as it may: When you read these lines, dear reader, I walk this planet for 52 years—and I can only hope that Augustine will not address his reply to the present article to the “late” Michael Nahm.

⁶ Sudduth’s critique of Leininger’s case is untenable with regard to some of its most important features (Matlock,

2022a, 2022b). This shows that Augustine's (2022a, p. 379) arbitrary rejection of my "flawed assumption" according to which retrospective tampering is more difficult in before-cases compared to after-cases is not only illogical from a theoretical perspective but also contradicted by facts: It was precisely the time-stamped documentation of facets of Leininger's case—however imperfect—that already sufficed to demonstrate that core elements of Sudduth's "retrospective tampering" with it had been fallacious.

⁷To be sure, Augustine presented very many arguments in his commentary. But irrespectively of whether I agree with them or not, they barely concern my charges against his explanation for CORT. And he knows it. He stated (Augustine 2022a, p. 367) that he specifically selected my essay for consideration in his commentary because in addition to evaluating the survival evidence, I would have addressed "the most substantial challenges to personal survival published in recent years." Selecting my essay for this reason is very laudable. One hopes for an interesting discussion regarding these most substantial challenges. But oddly, Augustine explained in the next breath that "space" precluded him from discussing precisely these most important features of my essay, which, after all, contributed substantially to making him select it for inclusion in his commentary. But it is no wonder space ran out, given that Augustine preferred to spend no less than 33 double-column pages of large format on different matters, and that he critiqued numerous other aspects of my essay on umpteen of these 33 pages already. In his lengthy reply to Braude et al. (2022), Augustine (2022b, p. 413) lamented in response to a respective charge that it would be "perverse to complain in one breath that I didn't say enough, and then in the next that I said too much." But rather than considering such a stance "perverse," I assume that virtually everybody has already had experiences with people who use many words but do not say much with them. It is a common phenomenon. There is even a communication disorder that concerns excessive wordiness and repetitiveness, *logorrhea*.

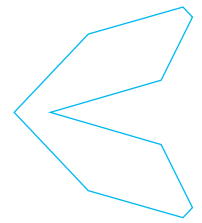
⁸As argued in my essay, this empirical finding poses a substantial challenge for the LAP model as well.

⁹It is bizarre: In essence, people who habitually deny the existence of psychokinesis and consider the belief in it to be a hallmark of pseudoscientific reasoning reproach parapsychologists and survival researchers for not having applied psychokinesis to their brain chemistry in order to make it cause more "rational" thoughts.

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COMMENTARY

Answering More of the Same: A Reply to Nahm

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HIGHLIGHTS

A recent commentary in favor of postmortem survival rails against the very mistakes or misdirections that it verifiably engages in. Authors should call out distortions of their points or positions, but they should also convincingly back-up such charges.

ABSTRACT

Nahm's preceding commentary accuses me of seven misrepresentations. One of these is an acknowledged good-faith error about a peripheral detail, while the remaining six are demonstrably accurate descriptions of Nahm's statements. At the same time, Nahm verifiably misrepresents me frequently and intentionally over issues that he takes to be consequential, which is a much more serious offense. All authors should call out when an interlocutor get their points wrong, but only when they can definitively back up the charge. Where Nahm weakly attempts to show that I misrepresented him, I will show that, if anything, his showcase consists of six verifiably accurate characterizations of his Bigelow Institute contest-winning essay's conclusions. His commentary exemplifies the truism that one can appeal to a million frivolous reasons to dismiss what an opponent has to say if one is absolutely determined not to hear him. Though committed survivalists will undoubtedly be satisfied that survival researchers have responded to me regardless of whether they have responded well, those that care about the underlying issues will hopefully find value in my reply.

KEYWORDS

Burden of proof; neuroscience; reincarnation; rhetoric vs. substance; scientific method

INTRODUCTION

My (One) Accidental Misattribution

Irony seems lost on Michael Nahm in his preceding commentary on this summer's adversarial exchange on the Bigelow Institute for Consciousness Studies (BICS) essay contest (Nahm, 2022). For his commentary admonishes authors for misrepresenting others even while it engages in misrepresentation *frequently* and *intentionally*. Although Nahm characterizes my initial critique of the BICS essays unfavorably, in fact is it *his* preceding commentary that *demonstrably* falls short of "the standards of objectivity, impartiality, and scientific responsibility

required in academic debates" by *repeatedly* engaging in the very tactics that he rails against. The seven misrepresentations that Nahm accuses me of, on the other hand, amount to one minor mistake and six verifiably accurate characterizations of his BICS essay conclusions.

Where it is relevant to his commentary now, I will also occasionally address "what Augustine kept silent about" on Nahm's contribution to the BICS competition. What I could have earlier exposed about his reasoning is not flattering, so Nahm should be careful what he wishes for. But he should take some solace in the fact that I lack the space to address the vast majority of his **non sequiturs**, sparing him further embarrassment.



Nahm accuses me of mischaracterizing his view “on multiple occasions” when I mistakenly attributed *one* arguably trivial *detail* about his view to him that he did not hold—namely, about *at which* exact numerical *rank* he would place his acclaimed James Leininger case of the reincarnation type (CORT) among the (presumably evidentially) “important” before-cases (CORT investigated before the families involved met and so could not share details) that he listed in a table. Clearly, that CORT falls *somewhere* in a ranking of the 15 (most?) “important” before-cases that Nahm thought worthy of listing. *Exactly where* he thinks that it stands remains unclear since Nahm never tells us that *now*. But the answer is inconsequential since Nahm made clear in his BICS essay—and reiterates now—that he held it in *high regard*, even if we does not know exactly *how high*, since he characterized it as “impressive” (2021*, p. 28, Table 2), “quite remarkable” (2021*, p. 26n12), and “well-documented” (2021*, p. 26). So my error about an arguably small detail¹ did not affect the accuracy of my general characterization of his assessment of this specific CORT. Nahm now confirms that he *still* holds it in high regard, just not in the highest possible regard since there are (in his view) better before-cases. Since a second-place ranking would fall below a first-place one, I never suggested otherwise.

So I got right that his Table 2 was a table of what he regarded as 15 “important” before-cases, but got wrong that it *ranked* #2 on that list simply because it was *numbered* #2. Evidently, the items on Nahm’s list were not listed *in the order of* how evidentially strong Nahm deemed them to be, but they were all “important CORT” (Nahm, 2021*, p. 28, Table 2). *Mea culpa*. I’ll let readers decide for themselves what Nahm meant by “important” before-cases to avoid risking further “misleading” them. Nahm’s other six claimed misrepresentations are nothing of the sort, so I’ll address them in the penultimate section further below.

Nahm’s (Repeated) Intentional Mischaracterizations

When compiling information from notes on multiple sources jotted down months earlier, and then putting it back together in a coherent way, it’s easy to make minor mistakes. Like typos, these are *inevitable* since to err is human. Moreover, once Nahm pointed it out, I immediately *owned* making the ranking error. It’s an entirely different matter when an interlocutor *knowingly* attributes a position to an opponent that his opponent does not hold—for example, when an opponent publicly clarifies *repeatedly* that he is not advocating a particular position, but his interlocutor doubles down on maintaining that he

is despite being aware of that clarification. *That* sort of misattribution is far more serious, and much more aptly characterized as misconduct that “does not meet the standards of scientific debates.” Consequently, it’s remarkable that Nahm’s commentary engages in just such intentional mischaracterization.

For example, Nahm characterizes me as “a physicalist who maintains not only that mind is positively caused by brain activity but . . . advocates the peculiar stance according to which all mental processes are brain processes and that the mind is the nervous system.” I don’t in fact advocate that “peculiar stance.” Perhaps Nahm failed to notice in the very summer exchange in question: “many contemporary philosophers of mind have been highly critical, for different reasons and for a long time, of both reductive physicalism and epiphenomenalism. . . . Their often persuasive (if not decisive) criticisms simply do not touch the dependence thesis—and so are irrelevant to its viability” (Augustine, 2022a, p. 385). Would I have characterized the criticisms of reductive physicalism as “persuasive” if I was persuaded by that view? If that wasn’t clear enough, I *reiterated* the point later in the exchange:

Contemporary philosophers of mind have been highly critical of both the identity theory and epiphenomenalism *for more than half a century*, and my arguments do not require one to assume either anyway, *as I had emphasized*. . . . [They] are largely skeptical of both identity theory (which already avoids causal exclusion) and epiphenomenalism (which seems to self-stultify by denying mental causation altogether). (Augustine, 2022b, p. 430n1)

And I explicitly pointed out that I have no interest in advocating reductionist physicalism/materialism (type identity theory) several years ago (in a source that Nahm cites!) when I noted that the contributors to my compilation, *The Myth of an Afterlife*, were not necessarily either reductionists or materialists, quoted one of them explicitly disavowing both, and pointed out that the most prominent arguments against an afterlife have come from David Hume and Bertrand Russell, “neither of whom were reductionists or materialists” (Augustine, 2016, p. 204). I framed the debate there, as in the book itself, as one between survivalists and mortalists (not “physicalists”), and more pointedly, one between opponents and proponents of the brain-dependence of individual consciousness (since that’s the more basic issue). Michael Sudduth got it: “Augustine and Fishman are not discussing the mind/brain identity thesis or contrasting it with mind/brain interaction. They’re comparing the mind/brain dependence

and mind/brain independence theses" (2021, p. 194). Further along, I reiterated: "One does not need to presume materialism, or indeed any theory of mind, in order to provide strong arguments for personal extinction" (Augustine, 2016, p. 222), and then listed the ways in which mind-brain theories that were neither reductionist nor materialist would entail personal extinction if they were true.

Now granted, in these comments I never outright repudiate the mid-20th-century position that mental states are simply *identical* to brain states, but that's only because I lack a knock-down refutation of it—and so remain appropriately agnostic about it.² But I have certainly never *advocated* type identity theory, and I haven't been coy about the mind-body theories to which I *gravitate*, either, which are not *that*. My *leanings* have always been toward theories closer to David Chalmers' property dualism (cf. Augustine, 2008, p. 239), or better, Russellian monism.³ These are just leanings, though, since I don't pretend to *know* the correct solution to the mind-body problem, which one need not resolve in order to have strong evidence against discarnate personal survival.⁴

To be fair, I *did* conclude Nahm's cited chapter by quoting Michael Spenard: "the best explanation [of mind-brain correlations] would be of a physical linkage: the mind is affected by alcohol because the mind apparently *is* the nervous system, which belongs to the same physical domain as alcohol" (Spenard, 2011, p. 62). But those are Spenard's words, and I would've worded his point about *assessing the neuroscientific evidence* most relevant to discarnate personal survival differently. One can advocate a "physical linkage" without advocating the narrower type identity that Spenard's "the mind apparently *is* the nervous system" implies. I quoted him to show that *others* have also inferred that the best explanation for known mind-brain correlations would yield the conclusion "that having a functioning brain is a *necessary condition* for having conscious experiences" (Augustine & Fishman, 2015, p. 203), which is *my* thesis explicitly defended throughout the chapter (and elsewhere in the book). (Type identity is compatible with this broader thesis, but is not required by it.) Indeed, I write about mental activity *depending* upon, being *caused* by, or being *enabled* by brain activity, but never about it being *identical* to brain activity, precisely because the latter view is not warranted by the mind-brain data. There's a *reason why* I talk about brain activity being a necessary condition, rather than a necessary *and* sufficient condition, for a having a human mental life. It could be both, I suppose, but if one has good reason to conclude that it's *at least* a necessary condition for it, then one has good reason to conclude that discarnate personal survival does not occur.

Spenard's exact words are imperfect, but so are

those of others whom I quote. When others make a central point that you're also trying to convey, you quote the words that are available to you. Other authors might make insightful points without putting them in the best possible way. Many of the quoted philosophers in the chapter, for example, make excellent points when talking about substance dualism specifically (e.g., Patricia Churchland, Frank Dille, Mathew Iredale, William Hasker, Mark Johnston, and Colin McGinn), even though their points are more applicable to a broader mind-brain independence thesis.⁵ Since mind-brain independence is what's necessary for discarnate personal survival to occur, whether *it* is true is the more basic issue for the survival question. But philosophers typically write a great deal about specific mind-body theories⁶ and very little about survival. In any case, if Nahm had misunderstood why I quoted Spenard at the end of my 2015 chapter, that misunderstanding should have been corrected by the *explicit* clarifications that I've made *in print* since (Augustine, 2016; 2022a; 2022b; cf. Sudduth, 2021) and of which Nahm is aware.

Given Nahm's professed concern with "disseminating misinformation that is often difficult to erase again from the literature," one wonders why he engages in it himself. Such behavior subverts scientific progress because, as Nahm notes, the "advancement of a scientific debate is impossible under such conditions."

Nahm's Mischaracterizations to Shift the Burden of Proof

Nahm also writes about my supposed "explanatory model for CORT according to which all facets of a case can be explained via mundane means"—though I have never offered such a thing. Not once have I claimed to *know* (even merely more probably than not) that no paranormal information or influences were responsible for specific features of a CORT. Rather, what I've claimed is that Nahm and other reincarnation researchers *have not shown* that paranormal sources of information or influence *were* responsible for accurate statements about past lives, say, or the presence of birthmarks. To suggest otherwise is to **shift the burden of proof** off of himself and ascribe it to anyone (such as a reincarnation *agnostic*) who does not affirm Nahm's belief. But as an empirical survivalist, Nahm is the one claiming that the reincarnation hypothesis best explains the presence of certain CORT features. So where is Nahm's inference to the best explanation (IBE), exemplifying the simple form laid out by philosopher of science Elliott Sober (in Augustine, 2022a, p. 374)? In the absence of a *formal* inductive argument of *some* kind (even if not an IBE), all that we have is Nahm's *assertion* that specific

CORT features warrant jumping to the conclusion that reincarnation has occurred in a particular case.

Whatever he imagines constitutes my “explanatory model for CORT,” Nahm oddly characterizes me as “a vigorous proponent of this model.” In the Introduction that he cites (Augustine, 2015, pp. 23–27), I surveyed extant criticisms of survivalist interpretations of CORT found in the literature—and nothing more. Granted, I mentioned only those that I think worth mentioning, and mentioned some details not mentioned in other surveys. But this is no different than what I did in other sections, such as in my survey of moral objections to theological conceptions of an afterlife (Augustine, 2015, pp. 11–19). And it’s no different than what James Matlock (1990, pp. 238–255), Harvey J. Irwin (1999, pp. 267–272), or Braude (2021*, pp. 12–19, 30–34) did except for the fact that I didn’t mention criticisms that invoke conjectural forces or entities unknown to science. Do *their* overviews of criticisms of survivalist interpretations of CORT render them “vigorous proponent[s]” of “an explanatory model for CORT” alternative to that of survival/reincarnation? If not for them, then not for me. Simply throwing into one’s literature review conjectural living-agent psi (LAP) possibilities does not make—or unmake—an explanatory model.

If I had actually had “an explanatory model,” I might have said how much weight to give each independent criticism or counter-explanation provided by different critics. I didn’t because I was not trying to *justify* any particular conventional explanation of CORT, just surveying the non-reincarnationist explanations that have been offered in the literature and how features of the CORT evidence itself do not warrant, and sometimes defy,⁷ a reincarnationist interpretation. The burden is squarely on those who argue that some novel sort of explanation is required to account for CORT or their features, which requires *them* to show that no alternative conventional explanations can otherwise account for these, since *they* are the ones making the positive claim that only actual reincarnation (or at least LAP) is (probabilistically) capable of accounting for such. I merely *questioned* that inference. The focus of my BICS critique was quite naturally on *empirical survivalists’ case* for a survivalist interpretation of CORT. Conventional counter-explanations are relevant to this only to the extent that they suggest that postulating reincarnation is superfluous.

No doubt it was better rhetoric for Nahm to associate the points that I surveyed with “[Paul] Edwards’ emotionally-tainted ridicule of CORT research” (Nahm, 2021*, p. 45) than with *identical* points noted in Braude (2021*, pp. 12–19, 30–34), Irwin (1999, pp. 267–272), or Matlock (1990, pp. 238–255), among other places.⁸ What matters to the factual debate is not their *authorship*, but Nahm’s

concession: “The listed points of criticism are principally valid and nobody has denied that several CORT might indeed suffer from such shortcomings” (2021*, p. 40). And an author comprehensively surveying (or even raising for the first time) criticisms of reincarnationist interpretations of CORT *in the literature* is *not* thereby suggesting that each criticism concerns a *sizable* problem known to infect the research, or even that it reveals known (rather than merely potential) problems “would have been *present* . . . thereby alleging that the reports of all before-cases [or any CORT] *are* seriously flawed” [emphasis mine]. Nahm merely sprinkles his **guilt by association ad hominem** with a dash of **hyperbole**.⁹

Has Nahm *ruled out* a given possibility as a factor that might produce certain features of CORT? In at least some cases, perhaps he *has*! The only way for anyone to know is for Nahm to explain *how* he has ruled out a conventional factor:

Sometimes, Stevenson used different interpreters during his repeated visits for follow-up studies, and the important details were always congruent. The previous translations and case reports held. They also matched with the reports of independent local researchers who investigated the same cases as Stevenson with or without exchanging their notes. Of course, Pal, Nissanka, and others were able to understand the mother tongue of the interviewed families. Moreover, Stevenson, Haraldsson, Keil, Mills, and other Western researchers investigated numerous cases in which they were able to communicate directly with the interviewees, for example in French or English, and this not only in the West. Finally, the initial written records made in many before-cases were recorded and verified by native speakers, so it seems unlikely that they were misunderstood. (Nahm, 2021*, p. 46)

This is a *good response* to a particular *concern* initially raised by Ian Wilson and reiterated by others. The concern would obviously not apply to those cases where native speakers were the ones investigating the cases, though, and those who mention this concern *never claimed otherwise*. And Nahm’s response is not a once-and-for-all reason to disregard any and all criticisms of reincarnation research from here on out.¹⁰ Nahm’s mistake was to assume that by having simply *mentioning* the criticism, I thereby thought that the potential problem identified was *definitively known to be present* in some or many cases, when in fact I raised the issue simply because it needed to be *considered*:

Local interpreters who share a common societal belief in reincarnation *may* even unintentionally **distort their translations** of interviewees to make their testimonies seem more evidential than they really are (Wilson, 1982, p. 50), and *those who do not speak the language of the witnesses have no way of detecting such distortions* (Rogo, 1985, p. 74). [emphasis mine] (Augustine, 2015, p. 26)

This lone sentence is neither an explanatory model nor part of one, and it does not claim to explain all, many, or even a single feature of any particular CORT. Nowhere did I say that this possibility *has been detected*, unlike where I said that CORT produced by normal childhood play “have been uncovered” (Augustine, 2015, p. 25). As before, my concern was with whether reincarnation researchers have *ruled it out*, since that’s what *science* (in part) requires them to do to back up their claim to have good *empirical evidence* of reincarnation. As an empirical survivalist, Nahm asks the wrong question: “Where exactly did the parental coaching, misinterpretation, misreporting, or cheating enter the reports about Ryan and Gnanatilleka’s cases? What is the flaw that renders them untenable?” The scientific community (not me) asks a different question: “Where exactly did Nahm (or anyone else) rule out all non-reincarnationist conventional explanations, including those where dark data are potential factors?”

In order for Nahm to meet his burden and *show* (by the standards of the scientific community) that paranormal information or influence *was* responsible for certain features of a CORT, *he* would have to provide (good) *positive evidence* that reincarnation caused the presence of those features. How might he go about doing that?

Suppose that an investigator wants to know if a surface-to-air missile (SAM) caused a plane to crash. He does not merely rule out various (and certainly *not* exhaustive) alternative explanations to the SAM hypothesis, like fuel tank sparks, pilot error, instrument error, mechanical failure, dangerous weather conditions, etc.—though doing so might help him determine *where else to look* for an explanation. To clinch the case (in a way that would be acceptable *in a court of law* per the BICS beyond-a-reasonable-doubt standard), the investigator would have to *additionally* look for—and find—missile fragments, damage to the plane consistent with a missile strike, missile component residue on the wreckage, etc.

Do unexplained lights in the sky clinch the case for extraterrestrial visitation? Certainly not, since that involves ruling out all alternative possible causes for them

(including currently *unknown* atmospheric phenomena). A crashed extraterrestrial spacecraft (or other extraterrestrial artifact), on the other hand, would do the trick. So, with these examples in mind, how do survival researchers like Nahm establish—in a clinching way—that a birthmark was caused by the transmigration of a soul? How do they establish that it was alternatively caused by the PK of a living person who really wanted to see a deceased loved one again, and so “psychokinetically manufactured” evidence that would fulfill that wish? The ball is in Nahm’s court to answer that sort of question, since he is the one claiming to have strong evidence for reincarnation.

If both of us disappeared tomorrow, psychology textbooks would *continue to* omit reincarnation among their items of psychological knowledge because the question of whether or not we have scientifically authenticated evidence of reincarnation is not up to either of us to decide.

Nahm’s Seven Wonders of the World

In the preceding sections I’ve owned *accidentally* making one (arguably trivial) misattribution to Nahm (his example #3), in contrast to Nahm’s repeated, intentional, and significant¹¹ mischaracterizations of my views. In this section I will provide the fuller context of the other six supposed misattributions that I make to Nahm to show that, in fact, they are nothing of the sort. After reading his own words at length, readers can judge for themselves whether I quoted Nahm “out of context” for the purpose of “contorting their original meaning.”

In example #1, Nahm says that I misinterpreted “what [he] wrote in a remarkable way.” I had written that Nahm invoked a double standard by “writing of the dependence thesis,¹² ‘it is impossible to prove it from a purely logical perspective,’ even though, incredibly, he had just written ‘we usually don’t speak of ‘proof’ in sciences like psychological research’” (Augustine, 2022a, p.391n7). Nahm *now* says that by this he meant: “In contrast to for instance mathematics, one should principally not speak of obtaining proof in natural sciences including psychological research *and* neuroscience because it is virtually impossible to obtain 100% ‘proof’ for something in these areas from a logical perspective.” But this is *not* what Nahm said in his BICS contribution. There he said: “In fact, William James, the founder of American psychology, argued more than 100 years ago that it is principally impossible to prove that brain chemistry produces consciousness—all we can observe are ‘concomitant variations’ of brain states and states of consciousness” (2021*, p. 3). Now perhaps it’s just a coincidence that Nahm made a trivial point about the generic difference between science and mathematics with a callback to a specific Jamesian argument that

the hypotheses of mind–brain dependence and independence (or of producing and transmitting/permitting consciousness, if Nahm prefers) are *evidentially on a par*. Perhaps Nahm had no intention to convey the notion that the neuroscientific evidence in particular proves nothing, rather than merely that scientific evidence in general *proves nothing*. *Perhaps . . . but not likely*. For James uses it in exactly the manner that I had indicated, writing:

The theory of production is therefore *not a jot more simple or credible in itself than any other conceivable theory*. It is only a little more popular. . . . For polemic purposes, *the two theories are thus exactly on a par*. [emphasis mine] (James, 1898, p. 22)

Nahm, who explicitly takes his inspiration from and emulates James, is not making a point about the difference between *natural sciences* on one hand and *mathematical sciences* on the other—or anything of the sort. For that is not what James is doing, and Nahm’s explicit reference to only being able to observe “concomitant variations” between mental states and brain states has nothing to do with the certainty with which we can come to mathematical conclusions compared to how much less confidently we can come to scientific ones. Rather, the reference to concomitant variations is a callback to the stock commonplace that “correlation is not causation,” which psychical researchers have leaned on since James to argue that *the neuroscientific evidence specifically* proves nothing against discarnate personal survival. For Nahm nowhere draws the takeaway that *no* scientific conclusions are warranted in *any* empirical discipline (compared to mathematical conclusions), and James explicitly drew from this line of reasoning that he could dispose of “the physiological objection to immortality” (James, 1898, p. 51).

James argues that *the neuroscientific evidence* can never make a difference to which theory (production vs. transmission/permission) is more *credible* than the other. According to James, even though “physiological science has come to the conclusion cited” (James, 1898, p. 7)—that our inner lives are a function of our gray matter—nevertheless *its* evidence in particular (not that of natural science in general) can never *favor* one of these sorts of theories over the other. Nahm clearly does *not* believe that this is true of *other* evidence from psychical research since he cites *that evidence* as favoring reincarnation. Thus I *accurately* characterized Nahm as “raising the bar for neuroscientific evidence while lowering it for evidence from psychical research” (Augustine, 2022a, p. 391n7). It’s not a coincidence that neither Nahm nor any

other psychical researcher has ever appealed to Jamesian reasoning to argue, for example, that we can never “prove” (in a mathematical sense) that micro-PK affected random number generators (RNGs) because, after all, all that we have are concomitant variations between PKrs’ attempts and RNG output. Recall Nahm’s specific use: “William James . . . argued more than 100 years ago that it is principally impossible to prove that brain chemistry produces consciousness” (2021*, p. 3). There’s a reason why Nahm says *this*, but not that it’s principally impossible to “prove” that the Moon produces the tides, or that the heart produces the circulation of the blood.¹³

Contra the Jamesian argument, C. S. Peirce and Sober (and many others) have shown us how the (chiefly) neuroscientific evidence *can* favor the dependence of individual consciousness upon the brain (over the alternative hypothesis). I simply *applied* their abductive reasoning about evidence in general to demonstrate how this specific evidence *does* favor it. Empirical survivalists have long used Jamesian reasoning to deflect having to *weigh* the neuroscientific evidence against the survival evidence.¹⁴ For weighing the *totality* of the relevant evidence available to us—that is, *not* arbitrarily *excluding* the chiefly neuroscientific evidence in one’s assessment—would clearly tip the scales against discarnate personal survival. I understand that this finding is an unwelcome one *for survival proponents*, but focusing on potentially favorable evidence at the exclusion of any unfavorable evidence in an evidential/empirical assessment is mere politicking, not science.

In his example #2, Nahm objects to my paraphrase that “Nahm concedes [that near-death experiences/NDEs] are characterized by more differences than similarities” (Augustine, 2022a, p. 381) (caviling about the typo in the page number cited, too). Earlier, I had quoted him stating that NDEs “are clearly culturally influenced” (Nahm, 2021*, p. 16; cf. Augustine, 2022a, p. 376). My supposed mischaracterization purportedly stems from my failure to quote his earlier statement: “Although they are marked by cultural influence, NDEs share a common core structure featuring several elements” (Nahm, 2021*, p. 14). Since there is no inconsistency between any of these cited statements, Nahm’s complaint *now* that he had then “highlighted” that “NDEs share overall communalities *despite* their being culturally influenced” is misplaced.

Since I quoted Nahm stating that NDEs are “clearly culturally influenced,” and Nahm quoted himself stating that they are “marked by cultural influence,” it’s worth noting that one definition of the verb “marked” is “having a distinctive or emphasized character” (*Merriam-Webster*). Though Nahm cavils about the exact phrase “more differences than similarities,” my point was that the cul-

tural influences were so prevalent as to be impossible to miss. In other words, to anyone who actually reads the accounts, they are noticeably culturally influenced *through and through* (cf. Belanti, Perera, & Jagadheesan, 2008, pp. 123-127; Groth-Marnat, 1994, p. 11; Schlieter, 2018, pp. 286-290). This would be true even if Nahm meant something else by “marked,” making what he meant by it rather moot. What matters in the context of my point is that *it’s true that* there are more dissimilarities than similarities between uncontaminated NDE accounts from different cultures: “deceased or supernatural beings are encountered. These are often met in another realm . . . [that] is a social world not dissimilar to the one the percipient is from. . . . [T]he consistency of these reports suggests that at least these two [very general] features of the NDE are indeed cross-cultural” (Kellehear, 1996, p. 33). Later, Allan Kellehear elaborates on this point: “encountering supernatural and deceased beings, otherworld vistas, and perhaps a darkness,¹⁵ do seem to be crosscultural features associated with NDEs. Yes, these are general, and they are what you would expect from people claiming some sort of encounter with death or dying. But that observation does not lessen their significance or validity” (2007, p. 149). That even the “core” features of Western NDE accounts ubiquitous in popular culture are rarely if ever found in minimally culturally contaminated non-Western accounts *implies* more dissimilarities than similarities between them. Nahm’s complaint cavils, too, because I only *incidentally* commented on Nahm’s view here when making an altogether different point about Ian Stevenson’s motivated reasoning (only *mentioning* Nahm because the critique’s focus was the BICS contributions). The incidental comment *naming Nahm* could’ve easily been substituted with an otherwise identical one naming cross-cultural NDE expert Kellehear instead, and the point would stand (otherwise unaltered) as a true statement.

In his example #4, Nahm gripes:

But “survival researcher” Nahm did not “call” or “declare” anything to be a “prediction” in the context Augustine referred to. It was Augustine alone who retroactively declared some aspects of my introductory overview of empirical findings concerning CORT to be “predictions.” Because he did not inform his readers about his move, they are led to erroneously believe that I used this prominent scientific catchword inappropriately on several occasions.

Here Nahm again cavils, because it’s true that he never uses the word “predictions” when he lists his reincarnation hypothesis predictions. In the alleged misat-

tribution, I pointed out that Nahm *exemplified* “Survival researchers . . . [who] retroactively declare these patterns to be ‘predictions’ of the reincarnation hypothesis” (Augustine, 2022a, p. 380). My point was not that Nahm actually used the word “predictions,” but that he *derived* what he took to be predictions from his reincarnation hypothesis (whether he called them that or not). As the sentence immediately after the alleged misattribution makes clear (“But are they really its predictions?”), the quotation marks around “predictions” were shorthand for “so-called predictions” since one cannot *logically derive* from the reincarnation hypothesis (either deductively or inductively) the observational consequences that Nahm took from it. So I never claimed that Nahm “used this prominent scientific catchword¹⁶ inappropriately.” Rather, my point was that he was *deriving* observational consequences from the reincarnation hypothesis that one cannot, in fact, logically derive from it, plain and simple.

Nahm goes on to say that he agrees with me (for different reasons) that the observational consequences that he thinks support the reincarnation hypothesis “are no predictions at all.” But the way that Nahm uses them—as *scientific evidence for* reincarnation—that’s exactly the role that he gives them:

Science textbooks are more cautious about laying out recipes for science than they used to be, but descriptions of the hypothetico-deductive method [i.e., scientific method] are still fairly common. . . . In these [somewhat Popperian] versions, the hypothetico-deductive method is a process in which scientists come up with conjectures and then deduce observational predictions from those conjectures. If the predictions come out as the theory says, then the theory is [evidentially] *supported*. If the predictions do not come out as the theory says, the theory is not supported and should be rejected. [emphasis mine] (Godfrey-Smith, 2021, p. 94)

What it means for an observation to be *evidence for* a hypothesis (in part)¹⁷ is that we would expect that observation to be made if that hypothesis were true—i.e., that it’s minimally more likely than not that we’ll find it if the hypothesis is true. Whenever Nahm talks about evidence/data (purportedly) favoring reincarnation over alternative explanations, he is talking about (putative) predictions of the reincarnation hypothesis that were borne out. By claiming that “the best available evidence for survival among the different kinds of survival phenomena. . . . is constituted by cases of the reincarnation type (CORT)” (Nahm, 2021*, p. 5), Nahm is claiming that

we would expect to find CORT if personal survival—and implicitly reincarnation—were true. So Nahm thinks that CORT are more likely to be found than to be undiscovered if reincarnation is true. And when Nahm says that with the presence of wound-birthmark matches, a CORT “gains considerable strength” (2021*, p. 34), he is saying that the reincarnation hypothesis leads us to expect (i.e., *predicts*) birthmark cases even more strongly than it leads us to expect CORT that lack birthmarks.

However he labels them, Nahm’s predictions are nothing of the sort since the reincarnation hypothesis neither deductively entails them nor inductively implies that they will be found with a greater than 50% probability. *Failing to* have found Nahm’s “evidence” would *not* have not falsified/disconfirmed the reincarnation hypothesis because that hypothesis never predicted that evidence in the first place. For the same reason, finding his “evidence” would not confirm or lend evidential support to the reincarnation hypothesis, either. A hypothesis’ successful predictions *do* constitute evidence favoring that hypothesis—but only if the hypothesis really does lead us to expect that evidence. There’s a reason why early substance dualists like René Descartes never “predicted” that we would ever view our bodies from an out-of-body perspective—because dualism (sans the addition of uncheckable auxiliary assumptions) predicts no such thing. If an observation’s absence is not evidence against a theory, then its presence is not evidence for it, either.

Nahm writes that he “nowhere proclaimed the sweeping generalization ‘dependence thesis proponents regard survival impossible in an aprioristic way’” in his BICS essay. And, indeed, he never *stated* that idea that explicitly. But it is a plain implication of other things that he *did* state, making empty his complaint that “selling inferences for facts when quoting selectively . . . is misplaced in scientific debates.” He writes that “impartial court members would disregard socioculturally determined preconceptions about the nature of consciousness. They would not regard survival ‘impossible’ in an aprioristic way” (2021*, p. 66). Who does Nahm believe would *not* disregard the so-called “socioculturally determined preconceptions about the nature of consciousness”? Most plausibly, those production hypothesis proponents against whom his “impartial court members” stand in stark contrast:

To be more precise, truly impartial court members would act like this: They would *question the production hypothesis* according to which consciousness is exclusively generated by brain chemistry. Numerous lines of evidence introduced in my essay have shown that *this hypothe-*

sis is far from being established; and as stated in the Introduction, *it is impossible to prove it from a purely logical perspective*. Its widespread acceptance in Western cultures is merely socioculturally conditioned. [emphasis mine] (Nahm, 2021*, p. 66)

Who wouldn’t “question” the production hypothesis? By implication, those production hypothesis proponents who are *not* “truly impartial.” Since Nahm never distinguishes between partial and impartial production hypothesis proponents, but he *does* distinguish between “impartial court members” and those who *never* “question the production hypothesis,” his wording implies that *all* production hypothesis proponents are partial/biased, in contrast to his imagined dispassionate arbiters of truth.

Nahm’s sixth gripe is that I *labeled* the penultimate sentence of his section on mental mediumship—“The qualitative strength of mental mediumship cannot be regarded as ‘high’¹⁸ (2021*, pp. 13–14)—an “overall assessment” (Augustine, 2021a, p. 377). Nahm protests that “It is the sum of these five criteria that represents my overall evaluation,” not just this particular *evidential* criterion. Since he never provides a brief synopsis of how all five of his criteria would apply here, I reproduced from Nahm’s page-long appraisal only those comments most relevant to an *evidential* assessment of mental mediumship. I picked out Nahm’s caution not to read too much into this evidence to contrast his guarded judgment of its evidential strength against the less-guarded judgment stated in another BICS essay (and quoted at a comparable length).

Nahm’s other four criteria were: investigability, repeatability, quantitative strength, and relevance (to personal survival). The *investigability* of mental mediumship (that I had already quoted Nahm on) speaks to limitations on what sorts of evidence *are possible*, not the state of the survival evidence *obtained*. The *repeatability* of the phenomenon obviously informs investigability; *quantitative strength* concerns cases’ “complexity or richness in details” (2021*, p. 7); and *relevance* to the survival question is self-explanatory. Compared to these four criteria, I think that readers can see why Nahm’s assessment of *qualitative strength*—of observational conditions, eyewitness reliability, the objectivity or subjectivity of the evidence, and the ambiguity of its interpretation (2021*, p. 7)—would be a better indicator of what he took to be the *overall strength of the evidence* actually obtained.¹⁹

Although quoting it verbatim, by *labeling* the (arguably) most relevant of his five particular conclusions an “overall assessment,” Nahm takes me to have put his conclusion “into a false and inflated context.” Readers may want to compare my use (Augustine, 2022a, pp. 377–378)

against Nahm's page-long appraisal (2021*, pp. 13–14) and judge for themselves.

In his seventh and final example, Nahm clarifies that he prefaced his conflation “the living-agent psi model is also called the ‘super-psi’ model” (2021*, p. 49) with the adverb “Traditionally, . . .” Nahm suggests that this subtle qualification is equivalent to that of Sudduth's clearer “so-called Super-ESP hypothesis” (2009a, p. 399) (which is doubtful), but fails to acknowledge that, unlike Sudduth, Nahm never cautioned readers with any qualification as plain as day as “the term ‘super-psi’ is laden with unwanted and misleading connotations” (Sudduth, 2009b, p. 168).²⁰ Instead, Nahm's very next sentence says: “This term [super-psi] points to *the fact that* psi of an enormous quality and quantity *is required* to explain all facets of survival phenomena” [emphasis mine] (2021*, p. 49), which is question-begging and prejudicial (Augustine, 2021a, pp. 392–393n19). If Nahm had held that the traditional terminology was as unfortunate as Braude has long said (and whom Nahm now quotes), why didn't Nahm simply say so himself in his BICS essay? He could've easily talked about the *putative* fact or the *notion* that a disproportionate amount of psi is *said to be* required or is *arguably* required to explain the survival evidence. As I (and others) have pointed out, whatever “amount” of psi would be needed by the living—*however* one understands amount/degree—would be no less needed by the dead to produce the phenomena, so the entire premise of this loaded term is baseless. Since any psi phenomena requiring living psi superstars on LAP interpretations would require equally powerful deceased psi superstars on survivalist interpretations, it's simply false that “the psi or super-psi required must be attributed to living beings but not to deceased agents” (Nahm, 2021*, p. 50)—unless by “must” all that Nahm meant was that LAP interpretations *stipulate* that living agents are the source of the psi in question, whether that psi was below average, average, or absolutely stunning psi.

But Nahm's own words betray that he did *not* mean this. Nahm wrote: “The related term ‘living-agent psi’ is a qualitative attribution similar to saying that a star or super-star can be a ‘music star’ or a ‘movie star’” (2021*, p. 49). There is nothing either quantitative (how much psi) or qualitative (how rich/complex the psi) inherent to the concept of LAP. The term denotes *no more than* that the hypothesized psi originates from living persons. Any other characteristics *read into* the concept of LAP—such as Nahm's “complexity, qualitative and motivational aspects, theoretical ramifications, and . . . meta-evidence”—*project* various unstated and unverifiable assumptions on to this simple concept. Whether the psi originates from the living, the dead, the inanimate, the demonic, the ex-

traterrestrial, the interdimensional, or what have you, any one of those sources can produce as circuitous or as straight-line psi as any of the others—at least until we are furnished with a good reason to think otherwise.

Nahm's misuse of Braude's crippling complexity argument illustrates this well: “the ‘crippling’ complexity of some especially impressive CORT would have to involve the unusual but successful interplay of multiple sources of information from the living-agent psi perspective, thus weakening its position compared to the simpler causal nexus underlying the survival model” (Nahm, 2021*, p. 54). But Braude wrote in *his* BICS essay:

Ordinarily, we understand (roughly at least) what it means to say that a piece of information is obscure. But that conception of obscurity applies only to *normal* methods of acquiring information. For example, we consider information to be obscure when it's not widely known and when it takes some work to uncover. And by saying that it takes work to uncover, I mean that the information is either outside our perceptual field or otherwise difficult to access physically (e.g., if it's behind layers of security or other barriers, or if it's remote geographically and not accessible electronically). Notice, though, that *all* information allegedly acquired psychically by the deceased in a mediumistic scenario, either about a living person's thoughts or about some present physical state of affairs, counts as obscure in this sense, just as it does for ESP on the part of the living. In both cases, there's no familiar *physical* access to the acquired information, and so both survivalist and LAP interpretations of mediumship require access to information considered obscure—and for the same reason. Thus, survivalists are in no position to claim that the normal obscurity of mediumistically conveyed information places LAP-advocates at an explanatory disadvantage. (Braude, 2021*, pp. 6–7)

Braude adds that the supposed crippling complexity that Nahm attributes to LAP interpretation of CORT “poses a comparable problem” for a survivalist one: “As far as we know, psychically accessing multiple sources of normally obscure information is no more imposing than accessing one” (2021*, p. 8), whether it's done by the living or the dead. In short, Nahm has to impose conventional physical restrictions on what LAP can do that, if applicable, also apply to what deceased persons can do—and that we have no reason to believe are applicable to any kind of psi anyway (whatever its source).

CONCLUSION: ASSERTIONS SHOULD BE SUPPORTED

My reply to my commentators requested “just one *direct quotation* of a single instance where I explicitly attributed a position to a BICS essay contest winner that the winner did not advocate” (Augustine, 2022b, p. 430). Nahm evidently misreads this as expressing grandiose unawareness of “easily demonstrable misrepresentations of content according to [my] bias.” Is it theoretically possible that, somewhere in my BICS critique, I criticized empirical survivalists for making “unstated and undefended assumptions” that I’ve made myself? (Braude et al., 2022, p. 406) Certainly. That’s why I responded *and supported* that “here at least, it’s clearly false” that I did the specific thing that I was accused of doing (Augustine, 2022b, p. 423). My point was to urge survivalist authors to *back up* their accusations rather than simply make them. Otherwise, without fact-checking every unsupported statement, how can readers gauge the reliability of one’s accusations compared to those just made up out of thin air by 2020 US presidential election deniers?

We live at a time when too many people feel entitled to claim whatever they want without even *attempting* to justify their claims. But to maintain a *functioning* society with a diversity of views, we have to *demand* that people back up their claims. This is as necessary in survival research as anywhere else. And it is particularly obligatory for those mandated to meet an evidential standard as high as “proof beyond a reasonable doubt.”²¹ Disputants are expected to present evidence for their claims in a court of law (and judges are expected to hear both sides). My challenge was nothing more than a request of survival researchers to do the bare minimum and present (good) evidence for their claims. One cannot advance the debate doing any less, and treating with respect an issue as important to humanity as the perennial question of life after death outweighs preserving the ego of *any* individual or group.

Nahm characterizes me as “a fervid skeptic who styled himself as a guardian angel of objectivity, impartiality, honesty and scientific integrity,”²² when in fact his styling—not mine—simply represents Nahm’s attempt to shirk his responsibility to meet the basic standards of scientific rigor. He relentlessly **shifts the burden of proof**, attributing to me “the various means that Augustine considered to be sufficient for a mundane explanation for CORT.” In matter of fact, I’ve *never* said that the standard criticisms of CORT *found in the extant survival literature* among both skeptics *and* proponents were sufficient to explain all CORT, either collectively or individually, and in

fact I explicitly *admitted* that they were not (Augustine, 2015, p. 24, 39n31; 2022a, p. 379). Nahm does not provide a formal inductive argument—a *structured* argument with a recognized logical form, premises, and derivations from combining those premises—that generates the logical implication that reincarnation probably occurs, or best explains various features of CORT. To distract from *his* absence of an argument, he invents “[Augustine’s] allegation according to which all before-case reports are decidedly flawed.” But that **straw man** is nowhere to be found in anything that I argued. Talk about “diversionary tactics and immunization strategies”!

While Nahm’s preference for an assessment of the “differences in [survival researchers’] methodological approaches, the rationales behind them, [and] some of their strengths and weaknesses” is understandable, addressing these finer points is only appropriate when their more basic flaws have been addressed *and fixed*. Failing to weigh contrary evidence in an evidential assessment, relying on tired fallacies that are a mark of pseudoscience, addressing matters that one lacks the knowledge to speak on intelligibly (like the mind-body problem or free will issue),²³ etc., are far more basic and therefore more serious deficiencies. If survival researchers are unable or unwilling to avoid making rudimentary errors in reasoning, how will they ever be willing or able to avoid making more subtle mistakes?

One must acknowledge the disrepair of a structure before it can be fixed, and I merely *identified* the poor argumentation persistently undergirding empirical survivalists’ statements. It’s up to them to *fix* their arguments since they are the ones constructing them. Until they are *fixed*, getting into the nuances of different authors’ methodological differences is superfluous. Focusing on these particulars is only warranted *after* the more basic deficiencies have been *resolved*—and the summer exchange merely routed them out.

NOTES

¹ I did mistakenly attribute *more* weight to Nahm’s ranking than he explicitly indicated. How *much* more we don’t know since Nahm doesn’t tell us now where he *would* rank the Leininger CORT among his “important” before-cases. But correcting my “second-best” misattribution in brackets now makes clear how little difference the error makes: “Braude only expressed his change of heart about the evidential value of CORT recently, in his contemporaneous prize-winning essay itself, and largely due to the then-unpublished findings of Sudduth, which exposed the sloppiness of the investigation of a long-overhyped CORT (one [listed

among 15 “important”] “before case[s]” by Nahm). . . . Could the absence of credible conventional explanations of CORT be an artifact of the fact that they were not investigated deeply enough? This is not some mere possibility; Sudduth has already demonstrated an example of it in what Nahm deems to be [one of his 15 “important”] before-case[s], which Nahm characterizes as ‘impressive,’ indeed ‘quite remarkable,’ and even ‘well-documented’” (Augustine, 2022a, p. 379). Notice that the general points, even when they secondarily apply to Nahm specifically, are unchanged by the correction. Moreover, Nahm’s before-cases were presented as among the most evidential CORT around, so the *particular* numerical ranking of that one before-case made little difference to his case. Mentioning Nahm’s *particular ranking* was an afterthought (in my section about “Ranking the Survival Evidence”); what’s important about the Leininger before-case is that it’s the only one so thoroughly *independently* checked by an investigator who is not a reincarnation apologist, that it didn’t even meet the most basic requirements to show that reincarnation best explains the evidence in that case, and that Nahm held it in high regard anyway.

² I’ve said this explicitly and publicly online, if Nahm is going to cite private electronic communications.

³ For the record, my own *instinct* (not certainty) is that there is a qualitative aspect of the mind (*qualia*) that is *not* capturable by the concepts found in contemporary physics (or even a future physics). These *qualia* might be regarded as nonphysical *properties* of functioning brains—or they might be understood as intrinsic features/categorical bases of matter (quiddities/inscrutables, particularly those of functioning brains) that are not captured by the exclusively extrinsic/dispositional/relational/structural features found in explanations from physics (cf. Alter & Coleman, 2021).

⁴ Attributing reductive physicalism to survival skeptics is part of a long psychical research tradition of clinging to a rhetorically useful **talking point** come what may—namely that dogmatic adherence to a quasi-religious “physicalism” is what generates skepticism about discarnate personal survival (e.g., Grossman, 2008). Contemporary empirical survivalists seem incredibly reluctant to drop this talking point even when it is explicitly denied. Consider what this sophomore-level philosophy of religion textbook has to say about the matter: “The problem is that whatever our minds have to do with souls, they pretty clearly have an enormous amount to do with our brains. Damage to the brain can take away our memories or mobility or speech. At least some mental illnesses seem to depend on the balance of chemicals in the brain. The idea that we need a soul

to think and feel is speculation. The idea that our minds depend on our brains is difficult to deny. This makes it doubtful that your soul by itself could be you” (Stairs & Bernard, 2007, p. 301). Even if *you have a soul*, then, “it might not provide for life after death in the way people sometimes think it would” (2007, p. 301)—no physicalism required.

⁵ Their terminology is imperfect in part because C. D. Broad, Richard Swinburne, and E. J. Lowe have defended versions of substance dualism that permit or take for granted mind–brain dependence, so the quoted objections wouldn’t apply to those versions; and the objections might *also* apply to nondualist theories like Berkeleyan idealism (at least when such an idealist denies mind–brain dependence). That’s why it’s better to go straight to the heart of the matter—whether or not individual consciousness can exist/occur absent a functioning brain.

⁶ “Physicalist” is a label that I prefer to avoid because it grossly neglects the nuances raised by a genuine interest in solving the mind–body problem, but sometimes writers intentionally oversimplify for uninitiated readers by comparing just two mind–body theories—reductive physicalism and Cartesian dualism—as if they were the only two. If another author *forced* that false dichotomy, I would perhaps be closer to the former than to the latter since I don’t believe in traditional “souls.” But then the sorts of arguments that Nahm raises against physicalism, such as “nothing in physics and chemistry predicts that protons, electrons, atoms, or molecules will produce something like consciousness” (2021*, p. 3), would not apply to my view and thus would **straw man** it. Johnson (2018) illustrates how Christian apologists use the same tactic.

⁷ Just as one does not need an “explanatory model” to understand that certain features of apparently gratuitous suffering in the human and animal world are inconsistent with (or at least in tension with) the existence of an all-powerful, all-knowing, and perfectly loving God, one does not need an “explanatory model” to see that certain features of CORT and other survival evidence are inconsistent with (or at least in tension with) survivalist interpretations. And valid biological explanations for pain do not render the suffering that we encounter any less *prima facie* incompatible with the existence of an all-powerful, all-knowing, and perfectly good God.

⁸ Somehow Braude’s legitimate concern that “many cases also require the services of translators whose own biases, inadequacies, and needs might influence the direction or accuracy of the testimony obtained” (Braude, 2021*, p. 32), originally raised by prolific paranormal author Ian Wilson (1982, p. 50), becomes transformed

into “Edwards and Augustine’s argument” (Nahm, 2021*, p. 46) or “the conjecture of Edwards, Augustine, or Murray and Rea” (Nahm, 2021*, p. 57) in Nahm’s **guilt by association ad hominem**. Even if the skeptical literature contains “a disconcerting amount of scorn, sweeping generalizations, and misinformation,” that’s not an indictment of anything that I have written.

⁹ Nahm’s reliance on **spin** forces me to state the obvious: When I cite any particular author on a specific point, the act of citing that author on that point does not commit me to affirming all, many, or even any other things that that author has said before. Indeed, I cite *psychical researchers* raising my surveyed criticisms far more often than I cite parapsychological skeptics. For instance, in my Introduction on CORT, I merely cite *two points* from “Murray and Rea’s distorted critique” (Nahm, 2021*, p. 39) (‘laudably’ omitting all of their other ‘distortions’). By contrast, I cite Ian Stevenson 16 times, D. Scott Rogo 16 times, Leonard Angel 10 times, Ian Wilson 6 times, Champe Ransom 5 times, C. T. K. Chari 4 times, Satwant Pasricha 3 times, Jim Tucker 3 times, Antonia Mills 2 times, John Beloff and Stephen Braude once, and—excluding instances where Paul Edward quotes Champe Ransom verbatim—I do not cite Paul Edwards at all!

¹⁰ As Nahm seems to want when he writes: “Given that authors misrepresent the work of their interlocutors . . . are we entitled to believe that their lines of reasoning are objective and impartial even where they do not misrepresent the material they discuss? I strongly doubt that.” Not to mention that Nahm’s commentary does not fare well by that standard.

¹¹ After mischaracterizing me as a type-identity physicalist, Nahm goes on to derive what he (mistakenly) believes are substantial implications of that view, writing: “These deductions are consequential.”

¹² Even here Nahm cavils, writing: “I wrote specifically about the *production hypothesis* but not about a more general ‘dependence thesis’ as Augustine mistakenly claimed.” True, but as I pointed out in the BICS critique, the issue of contention was “the dependence thesis, Nahm’s Jamesian ‘production hypothesis’ being one version of it” (Augustine, 2022a, p. 385). So my *correction* was no mistake, but simply being more accurate: *any* functional or existential dependence in general, including but not limited to James’ “productive function,” would rule out discarnate personal survival. Since the broader dependence thesis is what is the more basic impediment to discarnate personal survival, not James’ narrower “productive hypothesis,” the former is the more appropriate concept. For even if James’ specific production hypothesis were refuted, the dependence thesis would not be—and discarnate personal survival

would therefore remain blocked, as Swinburne (1997, p. 310) noted. (The brain does not *produce* consciousness on Swinburne’s interactionist substance dualism, but nevertheless his immaterial mind cannot sustain individual conscious awareness absent a functioning brain.)

¹³ Nahm (and other empirical survivalists) would do well to follow survivalist David Lund, who once also regurgitated the superficial Jamesian argument (in Lund, 1985), but has since come to realize that it’s best left at the end of the 19th century where it belongs (cf. Lund, 2009, pp. 23–25, 83–85).

¹⁴ To wit: “The data of neuroscience will always be neutral with respect to the hypotheses. . . . Neuroscience cannot in principle distinguish between these two hypotheses” (Grossman, 2008, p. 228). Neuroscientific arguments against discarnate personal survival, we are assured, therefore “carry no weight whatsoever” (Carter, 2010, p. 16).

¹⁵ Kellehear’s clarification that “perhaps a darkness” could be read into minimally culturally contaminated non-Western NDE accounts is telling.

¹⁶ Given how often today’s survival researchers traffic in soundbites and slogans, it’s not surprising that Nahm thinks of a prediction as a mere “prominent scientific catchword.” But just because survival researchers habitually use a term in an ambiguous way does not mean that others cannot give it a more precise meaning: “Nahm presumes that the birthmark evidence supports the reincarnation hypothesis, but never shows us *how* that hypothesis . . . leads us to expect ‘physical features such as birthmarks or birth defects that can contribute to the identification of a matching previous personality’” (Augustine, 2022a, p. 381). What’s important here is *why* Nahm thinks that his reincarnation hypothesis would lead us to expect to find said birthmarks, whatever term he uses to denote that expectation.

¹⁷ Hypothetico-deductive (H-D) confirmation is necessary but not sufficient for providing evidential support for a hypothesis (Tennant, 2002, p. 417). Philosophers of science have improved upon simple H-D method since the early 20th century, but their improvements—such as inference to the best explanation, likelihoodism, and Bayesian confirmation theory—are simply variations on the general H-D theme introduced in middle school as “the scientific method” and discussed above. Because Bayesian confirmation theory is merely *probabilized* hypothesis-testing, Nahm’s distaste for it is unwarranted. Contra Edward F. Kelly (2016, p. 590), backed in Nahm (2021*, pp. 59–60), it is something of a gold standard: “Of contemporary accounts of a single scientific method, the clear front runner is Bayesianism” (Bird, 2011, p.

19; cf. Earman, 1992, p. 2; Gustason, 1994, pp. 119–127, 282–291; Hawthorne, 2018; Howson & Urbach, 1993). All that Bayesianism (and likelihoodism) adds to the scientific method is a sense of the *degree* to which a particular observation supports a hypothesis. Grades of evidential strength are based on the simple assumption that one’s degrees of belief ought to satisfy the axioms of probability theory—that is, that a rational bettor ought not make bets that he is *guaranteed* to lose. Blithely dismissing Bayesianism—the scientific method probabilized—as “looking through the wrong end of a telescope” (Nahm, 2021*, p. 60) because “neither I nor any other of the working scientists I’ve consulted had ever heard of it before” (Kelly, 2016, p. 590) is small-minded (e.g., there are [online Bayesian calculators](https://www.socscistatistics.com/bayes/default.aspx) for medical students to solve the probability of the hypothesis that one has COVID-19 given the evidence that one has lost one’s sense of smell; <https://www.socscistatistics.com/bayes/default.aspx>). And indicting a standard procedure because different authors using it might produce “antipodal results” (Nahm, 2021*, p. 60) is like blaming algebra because different students might present different formulaic solutions. Even those wary of Bayesian (or other) measures of *degrees of probability* for hypotheses hold that a successful (use-novel) prediction peculiar to a hypothesis increases its probability, whereas a failed one decreases it. (For a non-Bayesian sketch of how general relativity is probabilistically supported by its successful predictions, for example, see Earman, 1992, p. 132).

¹⁸ Nahm cavils that he also said that the qualitative strength of mental mediumship is “only ‘relatively high’” (2021*, p. 13), but that’s like saying that we should tentatively accept the “best” explanation even when it’s undoubtedly only the best of a very bad lot.

¹⁹ The cross-correspondences are *incredibly* intricate by Nahm’s *quantitative* strength criterion, for example, but their degree of evidential support for survival may well be *inversely* related to their intricacy (Braude, 2003, p. 99). So too for the inordinate amount of twaddle that investigators are forced to sift through to find any potential signs of communication with the dead. Researchers have repeatedly attempted direct tests of survival (or of mind–body separation) precisely because their straightforward *simplicity* is what would render any successful results from them so evidential.

²⁰ And if Sudduth once begrudgingly used a then-standard but **loaded term** so that others who had never thought twice about it would understand his meaning, but *stopped* using it since for undeniably valid reasons long emphasized in the literature, that’s altogether different from acknowledging that a term should no longer be

used for the reasons cited, but then continuing to use it anyway. I’ve similarly used *falsify* and *disconfirm* interchangeably because I don’t expect the average JSE reader to know the difference between Popperian *absolute* falsification and the sounder concept of *degrees of disconfirmation* (since all observations are theory-laden, one can reasonably reject a theory’s auxiliaries rather than the core theory itself, and so on). But presumably the average JSE reader *does* know that failed predictions count as evidence against the theories that make them, and likely associates the term *falsification* with *that* idea rather than the more specific concept that Karl Popper had in mind.

²¹ It’s odd for Nahm to voluntarily enter projects to convince *others* of his views using *evidence* with the attitude that “For those who made solid first-hand experiences demonstrating the contrary, [skeptical] authors are simply not on a level playing field. They do not know what they are talking about.” If you already “know” that psi or discarnate personal survival occurs, then of course nothing that anyone else can say will ever convince *you* otherwise. But this doesn’t apply to most of us, who are not among the chosen people. And it’s entirely possible that Nahm is one of the select few with first-hand access to clear-cut information that settles these issues for him beyond any doubt. But his argument from revelation has no bearing on the debate at hand: “It is revelation to the first person only, and hearsay to every other, and, consequently, they are not obliged to believe it. . . . [T]hough he may find himself obliged to believe it, it cannot be incumbent on me to believe it in the same manner; for it was not a revelation made to me, and I have only his word for it that it was made to him” (Paine, 1794/2010, p. 21). Surely even Nahm is unpersuaded of the occurrence of *some* events that others seemingly of good character swear up and down to having witnessed first-hand. There’s good reason, for example, why the testimonial “spectral evidence” propping up the Salem witch trials is no longer admissible in a court of law.

²² This **ad hominem** is also a **red herring** that attempts to move the spotlight off of the arguments presented in the BICS competition and on to the motivations of their evaluator. Does producing a commentary on the BICS exchange thereby render Nahm a “fervid” reincarnationist “who styled himself as a guardian angel of objectivity, impartiality, honesty and scientific integrity”?

²³ According to Nahm, physicalists maintain that human beings “are causally closed entities” and therefore, if they are consistent, are committed to holding “that there is no free will and that 1) we never had any chance to act differently than how we acted in the past and

that 2) our futures are likewise fixed already except for quantum events we cannot influence.” Nahm’s (1) is true of what (hard or soft) *determinists* hold (whereas physicalism allows for uncaused quantum events and thus, debatably, for libertarian free will), and determinism is not avoided by simply rejecting physicalism anyway. If you have a reason for acting, then that reason *caused* (determined) your act. Under determinism, whether the causes of acts are entirely physical, both physical and mental, or entirely mental makes no difference so long as the acts are *caused*. Any act that happened *because* of its cause was determined by it—“because he made me mad” is no less causal than “because my aggression neurons fired”—and so out of one’s control. If any of one’s acts happened uncaused, on the other hand, then they happened for no reason whatsoever since nothing caused them to happen, and they are no less out of one’s control. Uncaused acts that happen *to me* are no more in my control than fixed caused acts “since I have nothing to do with them” (Taylor, 1974, p. 47). So if Nahm’s (2) is true, it’s true for *everyone* (physicalist or otherwise) (cf. Shafer-Landau, 2018, p. 187). Ever since 20th-century Frankfurt style cases, though, philosophers specializing in metaphysics have moved toward decoupling *causal* responsibility for an act (which determinism entails) from *moral* responsibility for it, which might (or might not) warrant holding people morally responsible for their actions. And there would be practical societal (e.g., legal) reasons to hold people accountable even if we had no moral responsibility anyway. While Nahm may “marvel” at how even ardent determinists can call out bad behavior or reasoning, there’s no mystery in this at all: “You do not excuse a man for doing a wrong act because, knowing his character, you felt certain beforehand that he would do it. . . . The punishment of a man for doing a wrong act is justified, either on the ground that it will correct his own character, or that it will deter other people from doing similar acts. . . . [Y]ou hope that a few treatments of this kind [e.g., calling out his bad behavior] will condition him to the habit of truth-telling, so that he will come to tell the truth without the infliction of pain [or embarrassment]. You assume that his actions are determined by causes, but that the usual causes of truth-telling do not in him produce their usual effects. You therefore supply him with an artificially injected motive . . . which you think will in the future cause him to speak truthfully” (Stace, 1952, pp. 289–291). A quick Internet search might’ve answered Nahm’s gotcha question, but he would have needed a genuine interest in the underlying issues to have conducted one. Nahm’s contentment with simply assuming without argument that we have

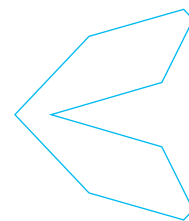
free will notwithstanding: “What is wanted is not the will-to-believe, but *the wish to find out*, which is the exact opposite” [emphasis mine] (Russell, 1922, p. 19).

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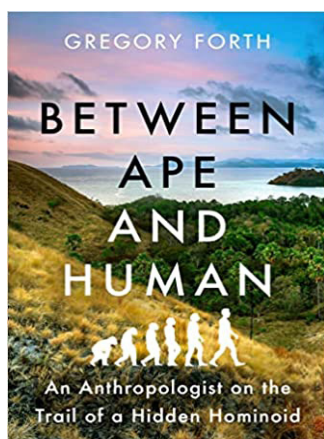


BOOK REVIEW

Between Ape and Human: An Anthropologist on the Trail of a Hidden Hominoid by Gregory Forth

Jeffery Meldrum

Idaho State University



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Dr. Gregory Forth's latest publication, *Between Ape and Human*, is his first monograph directed to a general audience. While maintaining a scholarly approach, it provides a more accessible, welcome, and authoritative voice (Forth, 2012) addressing the timely anthropological question, "Are other hominids alive today?" His decades of ethnographic field research are juxtaposed with the discovery of fossil hominins on the eastern Indonesian island of Flores. The discovery of 50,000-year-old skeletal remains of an australopithecine-like hominid seem to lend substance to the traditional and contemporary stories of hairy diminutive ape-men who may survive to this day.

The announced discovery of *Homo floresiensis* came on the eve of a department seminar as part of my bid for promotion to full professor. I hastily prepared and added a preamble to my presentation, highlighting the implications of the discovery for the prospects of the persistence of relict hominoids, including the sasquatch, which has been a central element of my research program. Based on feedback following my presentation, the bearing of the unfolding of the discovery of *H. floresiensis* for my research, considered questionable by many of my colleagues, was utterly lost on them. Indeed, the discovery of the "Hobbit", and other indications of additional persistent hominin lineages of an ever-bushier hominin tree, has likewise been seemingly lost on the anthropological community at large, as well. This in spite of isolated comments, such as *Nature's* managing editor Henry Gee's (2004):

"The discovery that *Homo floresiensis* survived until so very recently, in geological terms, makes it more likely that stories of other mythical, human-like creatures such as yetis are founded on grains of truth . . . Now, cryptozoology, the study of such fabulous creatures, can come in from the cold."

I was struck by the fact that some reviews of Forth's *Images of the Wildman* seemed reluctant to acknowledge and engage the central topic. One reviewer applauded Forth's methodology and contributions to ethnozoology without a single mention of the word "wildmen"—the very essence of his thesis. A few were more explicit in their praise of his "solid, ground-breaking" and "refreshing openness to the possibility" of an extant mystery primate (Corbey, 2009). Forth observed that the general reaction to his monograph might be characterized as "quiet respect." He noted that his election to the Royal Society of Canada came shortly thereafter, and was seemingly unphased by any passive resistance to his research topic.

Forth is now retired from his position at the University Alberta, after a tenure of more than 30 years. He received his doctorate in cultural anthropology at Oxford University (1980), where he studied the perceptions of the natural world by the indigenous populations of Indonesia, and thereby established himself as one of the few specialists worldwide in ethnotaxonomy and ethnozoology. *Between Ape and Human* carries forward the theme developed in his previous publication, *Images of the Wildman in Southeast Asia* (2008), in which he explored the image of the *ebu gogo*, described by the Nage



people. He proposed that throughout Southeast Asia and elsewhere, ‘wildmen’, known by a variety of names, e.g., *orang pendek*, cannot readily be explained solely as imaginary constructs rooted in cultural values and social institutions, nor as simply another kind of ‘spirit’. He argues for the evidence for these creatures as “empirical entities.”

Noteworthy is the fact that Forth’s proposal that the stories referring to the *Lai ho’a*, the Lio name for a diminutive relict hominoid, might still exist, preceded the announcement of *Homo floresiensis* by several years, in something of a prophetic manner (Forth, 1998). In *Between Ape and Human*, Forth more explicitly makes the case for connecting the dots. Indeed, the stated purpose of the book is to question the off-handed dismissal of similarities between the ape-man, as he refers to the *Lai ho’a*, and *H. floresiensis* as merely coincidental. He bolsters this argument by emphasizing the australopithecine-like, even chimp-like, qualities of *H. floresiensis*, calling into question its dubious allocation to the genus *Homo*, with the implicit assumptions often attached to that moniker. Forth rightly reiterates the unsettled question of fire or stone tool use by *H. floresiensis*, further emphasizing its non-human primitive attributes. He emphasizes that the presumed extinction date for *floresiensis* is inferred based upon a single site. Given the rarity of fossilization and subsequent discovery, the last known fossil almost certainly does not represent the last surviving representative of that species. Therefore, even a revised age of 50,000 years ago for the *floresiensis* site readily leaves open the possibility of recent survival of the hominoid.

Being foremost a sociocultural anthropologist, Forth acknowledges this is a book of stories—cultural images that originated long before local colonialism. But he remains impressed that he never encountered anyone who did not think the *Lai ho’a* were real. But they are assumed to be very rare entities and encounters with them were always fortuitous, albeit quite natural, matter-of-fact. While there is no contemporary body to substantiate an extant relict hominoid, these stories are retold and evaluated by Forth against the backdrop of a recent fossil record—a mere tens of thousands of years removed. This backdrop consists not merely of mute fossils, but the descriptions of contemporary encounters with ape-men that have seemingly anticipated numerous physical and behavioral attributes of the *H. floresiensis*. Forth provides a replete enumeration of the extensive correlations between them.

As Forth puts it, “. . . the challenge for social anthropologists is to discover the correct relationship between the palaeontological and ethnographic images and the true source of their resemblance.” *Between Ape and*

Human is an important contribution in navigating that relationship.

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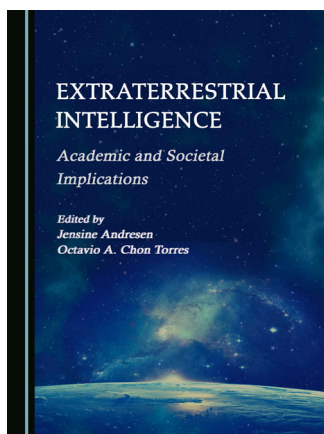


BOOK REVIEW

Extraterrestrial Intelligence: Academic and Societal Implications (Eds). J. Andresen & O. Chon Torres

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The impact on human society of new scientific discoveries is generally a quite gradual one, and more evolutionary than revolutionary. At least on the timescales that describe our everyday lives. New physics or chemistry or biotechnology takes industry some time to assimilate, and new products often take years to deploy. Today's top discoveries in astronomy have very little impact at all, perhaps piquing the interest of society's scientific bent for one or two news cycles, perhaps leading to revisions in a few paragraphs of the next editions of standard textbooks.

New behaviour observed from a black hole in a galaxy far, far away might be absolutely fascinating, but beyond those who find it so the rest of human society will continue along its merry way oblivious.

Could this be about to change? Thanks to NASA's *Kepler* and *Transiting Exoplanet Survey Satellite (TESS)* planet-finding missions, together with a slew of ground-based facilities, "exoplanets"—planets that orbit around stars other than the Sun—are now mainstream. At the time of writing, there were 5197 confirmed planets detected around other stars (NASA Exoplanet Archive), a number that is steadily increasing as the exoplanet surveys continue providing copious new data for astronomers to sift through and look for telltale planetary signatures.

Whether or not we are alone in the universe has been a smouldering question for humanity for centuries. The first exoplanets discovered in the mid-to-late 1990s fanned the embers into flame, and the explosion in discoveries from *Kepler* and *TESS* have poured gasoline on the fire: Naturally the question of whether any of these planets can host life arises. Most of them are not deemed "habitable"—they are either gas giants with no rocky surface, or are estimated to be either too hot or too cold for the presence of surface liquid water, a key ingredient for "life as we know it". But many are, and current estimates put the fraction of Sun-like stars with habitable planets at about 50%, give or take (Bryson, 2021, p. 36). That means about 4 potentially habitable planets around Sun-like stars within the nearest 30 light years, and two billion or so in the Milky Way galaxy.

The impact of the discovery of exoplanets on astrophysics cannot be overstated. In the last 25 years, the possibility of life on other planets has gone from an exercise of pure speculation in a vacuum of any observational constraints to being widely accepted and studied by the scientific community. A sizable fraction of astrophysics funding and new university and observatory faculty hires now go into searching for, characterizing, and modelling exoplanets. One of the primary science goals of the recently launched NASA flagship James Webb Space Telescope, and of the upcoming generation of 30 m class ground-based telescopes, is to examine nearby planets for signs of atmospheres and even "biosignatures"—the signature gases of photosynthesis, or other plausible metabolisms of life.

If life is common in the universe, the panoply of new instrumentation that will fo-



cus on exoplanets in the coming years means *we are likely to witness the discovery of biosignatures within our lifetimes!* Such a discovery would surely be one of the most important advances in knowledge in human history, and potentially revolutionary rather than evolutionary. There is a big difference between “life” and “intelligent life” of course, but the mere presence of “life” increases probability estimates for the latter enormously.

After many decades of discussion in the popular press and in the fringes of the scientific literature, Extraterrestrial Intelligence (ETI) and even the possible presence of alien intelligence here on Earth, must then also have become respectable, mainstream scientific topics? Well, not quite.



Figure 1. Sidewalk stencil seen in Harvard Square, Cambridge, Massachusetts.

During a recent stroll in Harvard Square, I came across a stenciled UFO with the phrase “They have landed . . .” on the sidewalk (Figure 1). Mainstream science is still not far from the viewpoint of this that it has had for the last 80 years or more.

But thanks to exoplanets that is changing. In the United States, the Search for Extraterrestrial Intelligence (SETI) has come out of the funding wilderness, into which US Congress banished it by cutting funding in the early 1990s (e.g., *The New York Times*, 1993), and into the limelight of modest renewed Federal Government support and substantial private funding. Detection or discovery of ETI would not only raise the stakes on “one of the most important advances in knowledge in human history” but

would make a truly profound impact on human society. Not only from a scientific perspective, but also philosophically, theologically, and psychologically.

And so we come to *Extraterrestrial Intelligence: Academic and Societal Implications*, a book intended as an interdisciplinary look at ETI and the implications its discovery would herald. It comprises 300 or so pages of writings from some leading thinkers on ETI that run the gamut from astrophysicists to an expert in Eastern religion and philosophy, and a kitchen sink full of everything in between. The volume is divided into two parts, each consisting of nine chapters. The first part is slated as offering philosophical and scientific perspectives, and the second social science and interdisciplinary perspectives.

I learned a lot reading this book and enjoyed it enormously. Well, mostly. A couple of chapters did feel a bit like the reading equivalent of watching the psychedelic sequences toward the end of *2001: A Space Odyssey*. More on that later.

The first chapter, “Cartographies of knowledge and academic maps” by independent scholar and writer Jensine Andresen, sets us up for the discussion in the rest of the book. Andresen posits that it is the very organization of academia into its neatly siloed disciplines that is responsible for the failure of our species to educate ourselves to successfully address fundamental existential problems, like climate change, wars, sharing of resources, and . . . addressing *Unidentified Aerial Phenomena* (UAP). Appeals for a change in attitude of scientists in academia toward ETI are also sprinkled throughout the various writings in the book. Having attempted to navigate the route of interdisciplinary research myself, I found Dr. Andresen’s comments on this especially spot-on. Her arguments against the rigidities of present-day education and research, characterized as essentially an institutionalized “stay in your lane”, do make sense and many a scholar who has pondered the interdisciplinary route will also recognize this thinking.

Not surprisingly, UAP, and the *Fermi Paradox*, are recurring ETI themes throughout the different chapters. “UAP” is the rebirth of “UFO”, a fresh acronym unsoiled by the, shall we say, unscientific baggage that the term UFO garnered over the years. The *Fermi Paradox* is the tension between the notion that ETI is common in the Universe and the lack of scientifically convincing evidence for it. It stems from an informal lunch conversation between Enrico Fermi, Edward Teller, Emil Konopinski, and Herb York at the Los Alamos National Laboratory circa 1950 about “flying saucers,” in which Fermi asked the now celebrated question “Where are they?” (Jones, 1985). As this book attests, it is not an unreasonable question today! Indeed, in addition to Andresen, several of the authors lament the

fact that UAP are not studied by mainstream academia and they are of the clear opinion that UAP *are* evidence of the presence of ETI here on Earth. Fermi Paradox resolved?

This is where the volume perhaps misses half a beat. The fundamental reason UAP have *not* entered mainstream science is that the ETI explanation pretty much requires faster than light travel if life elsewhere is anything like the Earth's examples. Even though the Universe is now thought to consist mostly of "Dark Energy" and "Dark Matter," neither of which are presently understood and represent gaping holes in our theory, faster-than-light travel is not an accepted possibility in physics as it stands today. Special Relativity, Einstein's theory of the behaviour of matter in the absence of strong gravitational fields, shows how the mass of a particle becomes infinite as it nears the speed of light. The theory has been tested to exquisite precision and is a basis of the physics at work in particle accelerators routinely in use around the world. Dark Energy and Dark Matter scream in our face that our physics is grossly incomplete, but we do not get a blank slate to make up what we like, including faster-than-light travel. Under such restriction, UAP as evidence of ETI is not likely to tap into public sources of science funding or attract a groundswell of professional scientists to study it.

Several authors touch on other appeals outside of current physics that obviate superluminal travel, such as ETI existing on or utilizing higher dimensionalities. Humans, in a universe 13.7 billion years old, have been technologically savvy for only a century or so. The level of technology and the nature of ETI thousands, millions, or billions of years in advance of us would, in the words of Arthur C. Clarke, be indistinguishable from magic. Sentience and intelligence themselves also are difficult to define, as recent studies such as those into the possible sentience of fungi remind us (Support Psyche). We must be careful not to be drawn into the anthropomorphic trap: The form of ETI could be very different from ourselves, or even to life on Earth, such that thousands of years of travel at sub-light speed might not be so problematic after all.

In chapter two, "Communicating with an extraterrestrial intelligence," Eamonn Ansbro argues that UAP *are* manifestations of ETI, and that the former can inform how to communicate with the latter. Ansbro makes the interesting point that electromagnetic radiation might not be an effective means if ETI employs some form of superliminal technology. This all sounds plausible enough, but the foundation of Ansbro's arguments, and of others in this volume, is that UAP *do* behave in ways that defy a terrestrial origin explanation and therefore demonstrate that ETI is present on Earth. But the former assertion re-

mains far from proven (David, 2021).

Astrophysicist Chris Impey takes up both sides in a delightfully written chapter three, "Why are we so lonely?" On the one hand, as Impey notes, in this era of exoplanet discovery most astronomers at this time probably do think that life exists elsewhere in the Universe—there are just too many planetary systems out there, to the tune of 10^{20} , or 100 billion billion in Impey's assessment. This does render the prospects of ETI somewhat more likely. On the other hand, he asks what have we truly learned about ETI if UAP are indeed their manifestation? His answer is essentially nothing, at least nothing of any real scientific value. And thus, Impey concludes that "Contact has not happened," and, with Fermi's "where are they?" question in our minds, that it is not inevitable "soon, or ever."

That rather gloomy take amidst the UAP exuberance of most of the rest of the volume is followed by two appeals to study UAP and ETI in new ways. The first is by one of the volume's editors, Octavio Chon Torres. The eminent Peter Sturrock, one of the founders of the Society for Scientific Exploration, has taught us that just about anything can be studied with the scientific method given an appropriate analysis formalism, and Chon Torres picks up a similar thread regarding the scientific study of UAP. UAP are generally not studied by professional scientists—for reasons noted earlier—but this does not have to be the case, including through direct observation or witness testimony. "An unidentified object remains unidentified, does not become something else and does not represent a challenge to the entire body of scientific knowledge." Chon Torres makes a tight and convincing case that Science can and should be applied seriously to UAP without prejudice.

A formidable piece, though slightly meandering and the longest in the book, is provided by Harvard professor Avi Loeb. Loeb is a colleague at the Center for Astrophysics, where I work; he is a remarkable scientist, and one I much admire. He has also become somewhat of a controversial figure in the astronomy community in recent years, some of whom feel he goes for the "It's aliens" explanations of phenomena rather too readily, and most notably in the 'Oumuamua case—the first interstellar object detected passing through the Solar System. Loeb was one of the first to voice the idea that it could be an alien artifact, or perhaps even a spaceship, and he returns to the topic several times in this piece. Astronomers with strong opinions against this idea point to work such as the findings of the "Oumuamua ISSI Team".

Comprising a dozen or so experts in a wide range of fields relevant for unravelling the 'Oumuamua puzzle this group concluded "that in all cases the observations are

consistent with a purely natural origin for ‘Oumuamua’ (‘Oumuamua ISSI Team, 2019). This is also far from saying that an ETI explanation is ruled out: It *could* be aliens, but the most likely explanation is that it is not. Loeb is of course aware of the evidence and exhorts the science community to keep an open mind, taking the bandwagon critics to task—I think justifiably.

Loeb’s chapter is somewhat of a tour de force, ranging from the physics of black holes and the early Universe, all the way through to Breakthrough Starshot—a concept to send a tiny spacecraft with a camera to the Proxima Centauri planetary system—and his thoughts on how society needs to rethink education, research, and the search for ETI. But it also lacks some direction sometimes and needs a stern editorial pen and proofreading to remove some repetition. Loeb cites the many *Scientific American* articles he has written, which is probably fine for most readers, although I would also have liked to see more primary references to some of the ideas discussed.

How we might actually detect and study UAP more systematically is the topic of a contribution by Hakan Kayal, a professor of space technology. Kayal’s chapter provides a good summary of UAP in general—see also Andersen’s Chapter 18 for that—and he outlines a plausible approach to the problem he terms “HYPER-SETI”, which is essentially a multi-wavelength image recording and analysis system. Getting more philosophical toward the end, he touches on what we might learn from a friendly ETI encounter: perhaps not only finally cracking that seemingly indestructible nut of how to unify Quantum Mechanics and General Relativity, but (and why not?) adding in the nature of consciousness to boot.

Physicist and industrialist Daniel Gross, not having been deterred by Chris Impey’s writing, begins his chapter with the assertion “Humans have been contacted by advanced extraterrestrial intelligences.” In a thought-provoking essay on how the evolution of intelligent biological life progresses, Gross introduces a generalised Copernican principle that he extends to life and its evolution, in which humans are not only nothing special in the Universe, but that universal life proceeds pretty much the same everywhere as it has on Earth. Such evolution to higher and higher intelligence likely does not proceed in a smooth, continually upward trajectory but is likely interrupted by periods of stagnation and even regressive societal collapse—a notion that hit home with the turbulent geopolitical times we find ourselves in looming in the background.

I am guessing that the authors of the individual chapters in *Extraterrestrial Intelligence* were given free rein to roam over whichever aspects of the subject they chose. Mostly this works out quite well, with little to raise eye-

brows about, at least on the visage of someone who has picked up a book called *Extraterrestrial Intelligence*. The chapter “The impact of physical sciences on the study of UAP” by astrophysicist Massimo Teodorani did exercise my frontalis rather more, and a couple of times on both sides.

All begins smoothly, with a similar lament to that of Chon Torres that the scientific method is robust enough to study UAP, but UAP remains quasi-taboo in the scientific community. And Teodorani does do a service in pointing out that quantum entanglement *cannot* be used for faster-than-light communication, as is speculated more than once elsewhere in the volume. The piece then riffs on the theme of inorganic “plasma life,” and idea that stems from computer simulations published in 2007 of dusty plasma behaviour by Vadim Tsytovich and colleagues (Tsytovich et al., 2007). In those simulations, helical plasma structures formed which under some circumstances could “replicate,” leading the authors to draw a parallel with the DNA helix and conclude that “complex self-organized plasma structures exhibit all the necessary properties to qualify them as candidates for inorganic living matter that may exist in space”.¹ For such a groundbreaking results, the absence of more extensive follow-up simulations is conspicuous; later laboratory experiments found the helical structure is just one of several that can form (Hyde et al., 2019). Drawing parallels between the helical structure in the plasma case with that of DNA to help the argument that the former is a type of life is surely spurious. Devilishly complicated plasma behaviour can still be understood through electric and magnetic fields, and gravity. Teodorani goes on to expound on several other fascinating ideas, but ones often somewhat speculative and too far removed from known physics for my eyebrows.

The second part of *Extraterrestrial Intelligence*, “Social Science and Interdisciplinary Perspectives,” was a more challenging read for me. I did find some gems, but at times was reaching for the coffee. I also learned some new words that I will never remember, and a lot about the remarkable scientist and philosopher David Bohm, for which I was grateful.

One gem is the short piece by scientist, educator, and priest Michael Reiss on UAP and the search for knowledge. While it touches on now familiar themes—the Copernican principle, UAPs and the Academy, and the implications of Contact—it does so in a most accessible way with reference to science fiction film and literature. Observations on bioethics and theology also get the same delightful treatment.

In a brief cameo return, Octavio Chon Torres points out that any response to Contact with ETI must be peaceful since a likely enormous technology gap would render

us defenceless.

Fortunately, social scientist and philosopher Konrad Szocik takes stock from evolutionary biology and presents convincing arguments that any ETI in our midst must be positively inclined toward us, or at least neutral.

A piece by historian and theologian Glen Messer provides the best first-hand account of a UAP sighting in the book—described as a black cube moving in a straight line above the Hudson. It is nice writing and provides good context for a theological discussion of what the human attitude would and should be upon ETI contact. Buddhist scholar Ronald Nakasone argues that the “multi-centered vision of reality” in Buddhist doctrine is better suited to the challenges of contact with ETI than, for example, the Christian ideology of Catholicism.

“Thought provoking” describes many of the chapters and for me is the strength of the volume—the feeling when confronted with so many fresh perspectives and lines of thinking that I had never considered was truly gratifying. The essay by physicist, chemist, and entrepreneur Carl Peterson with the lengthy title “Relativity and quantum theory: The manifestation of UAP and a new order for physics” had me scouring the web for more information on the work of David Bohm. Bohm also features, together with a lot of other good stuff, in “Will extraterrestrial consciousness remap the human mind?” by scientist and theologian Ted Peters. He describes his essay as an attempt to “put up street signs written in loopy cancelleresca directing us beyond the phenomenology of UAP to a holistic yet still scientific explanation.” Cancelleresca can sometimes be a bit tricky to read, and I did lose the way a couple of times. But, as they say, it’s the journey that counts, and Peters makes it a fun ride.

The chapter “The time model of contact and eastern authenticity testing” by philosophy PhD candidate Ole-na Kalantarova presented very intriguing ideas but it was less accessible to me—a reflection of my lack of education in eastern philosophy rather than of the essay itself; I did feel that I would enjoy a “for Dummies” version. An impressive and remarkable concluding essay, “Mind of the matter, matter of the mind,” by Jensine Andresen also strayed into territory beyond my limited horizons. But, gosh, I also found it fascinating and exceedingly well-written. A well-researched assay of UAP from a US Government perspective flows into Bohm-inspired thinking on the nature of ETI and interpretations of reported UAP behaviour. Some of those did exercise the eyebrows, but never to exhaustion.

What is there not to like about *Extraterrestrial Intelligence*? There is a lot of repetition of facts, ideas, and concepts between chapters and no attempt to cross-reference the different contributions—the book is essen-

tially a collection of independent essays with each of the authors evidently unaware of what is in the other chapters. This is fine for picking up the book and going for a quick delve into a chapter, but the binge reader might find the nth description of the Copernican Principle slightly tiresome.

It is not entirely clear what the target audience for the book is. Chapters have a range of entry levels, from Impy’s writing that any interested layperson would enjoy, to Kalantarova’s that has excursions into specialist territory. My privileged view from the astrophysics trenches gave me a leg-up on some of the more physicsy discussions that included references to quantum mechanics or relativity that readers without physics or science backgrounds might miss.

Some of the writers are of the firm conviction that UAP *are* evidence that ETI is among us and discourse extrapolates from that, I think sometimes further than the data warrant. It was always interesting, but I found some ideas overly speculative and had to suspend mental scientific critique on occasion. The eyebrows again.

So, should you buy *Extraterrestrial Intelligence*? If you are a *JSE* reader interested in the UFO phenomenon, yes, absolutely. If you are an open-minded ETI skeptic it will make you think from new perspectives. If you think ETI is among us, the ideas here are fascinating. Firm evidence of ETI *will* change the world and it is time we looked into this, seriously. Regardless of speed-of-light limitations in contemporary physics, taken as a whole, *Extraterrestrial Intelligence* makes a cogent case for the serious study of ETI and UAP in mainstream science. Its negatives are minor and the thinking is rich.

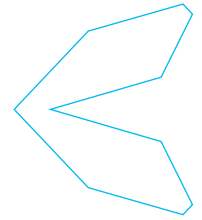
NOTE

¹This raises the old idea that if a computer simulation produces behaviour indistinguishable from life, then is the simulation itself also life?!

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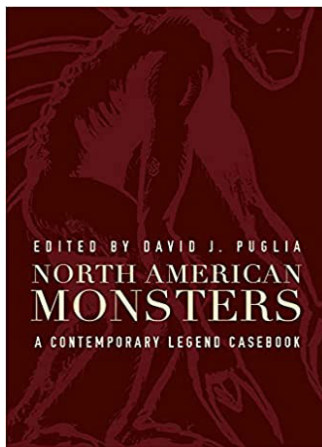


BOOK REVIEW

North American Monsters: A Contemporary Legend Casebook (Ed.) David J. Puglia

Thomas E. Bullard

Bloomington, Indiana



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Who doesn't love a good monster story? A delicious chill shimmies up the spine and tingles the hairs of listeners huddled around a dying fire on an autumn night as clouds cross the moon and extinguish its light, while the narrator's hushed voice winds the taut wire of terror to the breaking point. And then dry leaves crackle somewhere off in the dark. Anyone indifferent to the monster lurking just beyond the firelight is surely a dead soul . . . though I hesitate even to think the thought, lest a new monster be born.

This world and every world visited by the human imagination comes well-stocked with monsters. They have always been with us and remain robust in modern times. The realm of folklore with its giants, witches, trolls, and dragons gave many of us our first unnatural scares, and no scholarly discipline than folklore seems more tailor-made to study their cause. *North American Monsters* undertakes that responsibility with an anthology of nineteen articles, fourteen drawn from scholarly journals and five written for this volume, each committed to the understanding of monsters in contemporary legends.

Ah, the scholarly anthology. It often suggests a dutiful assemblage of dust-dry writing where the reader soon sleeps a sleep akin to coma and where all hopes of joy and excitement go to die. Well, this one is quite something more. Far from dull and dreary, here is a collection worthy of its subject. Editor David Puglia has chosen lively articles based on the authors' field research to introduce a range of fearsome creatures, some long-lived, some deceased, some recent and still walking among us. Beyond passing acquaintance, these articles familiarize the reader with their subjects, how these monsters are born and grow and die, the environments that favor them, the human energies that feed and sustain them. We get to know them. Sometimes they are villains, forces of nature, even tragic figures, but all of them have a purpose in the human realm that goes beyond eating people or leaving tracks and turds in the forest.

Puglia picks his contents with multiple purposes in mind to create a book that is layers deep. He brings together a scattered literature for the convenience of every reader interested in the subject, whether scholar or layman. Each article spotlights a distinctive monster, but rather than the usual field guide to the weird life of a state or region, each selection also illustrates how the theories and understandings of folklore studies illuminate the social and psychological functions of monsters, how narrators tell and audiences receive monster stories, and the ways historical and cultural forces shape the things we fear. Puglia intends the book as a teaching tool that introduces undergraduates to legend scholarship through its application to one familiar and popular type of story. It reaches far beyond mere entertainment to affirm that monsters are a legitimate subject for study, one that holds a mirror to the creators, perpetrators, and



consumers of those stories.

His ambition to combine varied contents and balance them with multiple goals sets a high bar for Puglia to clear. Not only does he succeed in this, but thanks to his introductions to each chapter and to the book as a whole, a collection of articles becomes an organic unity where each chapter contributes to a coherent understanding of the subject matter. Anyone intrigued by monsters stands to gain by reading this book, but it holds particular value for Fortean and anomalists. They will recognize the familiar names of David Clarke, Loren Coleman, and Benjamin Radford, contributing authors who join with the folklorists to consider influences of media treatment and local dynamics on a subject of mutual interest. For anomalists who overlook the insights of folklore studies, and for academics unfamiliar with extramural cryptid research, these chapters introduce worthy new vistas that broaden understanding of a cornerstone anomaly.

The monster hunter committed to finding hard evidence for a physical phenomenon will not appreciate this book. It has nothing to do with fur or footprints or photographs. It has little to say about the A-list celebrities of monsterdom—no Bigfoot, no Loch Ness Monster, Champ, or Ogoopogo, no sea serpent, Yeti, Piasa Bird, none of the unknown animals promoted by Bernard Heuvelmans or the subjects of cryptozoology magazines and websites. Nor will the literary or cinematic monster buff find Cthulhu, Frankenstein, or the mutant giant bugs of 1950s science-fiction movies. While Mothman and Chupacabras are widely recognized, perhaps too the Jersey Devil, most of the monsters appearing here are unknown outside of their locality. They shun the limelight as readily as sunlight, content to star exclusively in local legends, scaled for size as word-of-mouth traditions passed along within a receptive community. In place of physical evidence for unknown animals, the folklorist searches out the human meanings of monster legends. Puglia identifies four general themes to account for the uses, appeal, and staying power of these stories—socioenvironmental anxieties, otherness, commercial interests, and a sense of regional identity. If not the snarling beast of the hunter's wishful dreams, these issues answer many questions about what really lurks beneath the surface of stories we fear and love.

Who or what do we meet on this tour of legendary monsters? Perhaps the most numerous—and unsung—monsters in folk legend are highly localized creatures said to inhabit swamps, forests, the

undersides of bridges, and other such desolate and forbidding areas, from which they emerge to scare or kill hapless intruders. The victim may be a motorist whose car engine dies in the wrong place at the wrong time, or an unwise teenage couple that parks to make out within the monster's stamping grounds. As the story usually goes, the monster has established a reputation for killing, but exactly who and when remain vague, the sources hearsay from nameless friends of a friend. Lately, the monster appears only to frighten—but be warned, it is still there, ready to dine on anyone foolhardy enough to tempt it out of the shadows.

In the first chapter, noted folklorist James Leary recounts how his boyhood experience at summer camp included warnings of a bogeyman nearby. When a graduate student at Indiana University, he contacted a local scoutmaster and found that a nearby campsite had its own swamp-dweller, the Boondocks Monster. Its identities during the 1950s included an alien from a flying saucer, a swamp creature that left big footprints in the marshy mud, or even a giant turtle, then it morphed into a crazy killer on the loose during the 1960s, only to fade from campers' thoughts in the 1970s. This monster had few rumored kills to its credit and more often simply scared campers with its footprints or, more often, the stories told of it. More bloodthirsty was the Cropsey Maniac, a respected citizen turned into an insane axe murderer after some campers started a fire that killed his wife and children. Though human, his vengeful crimes multiplied to supernatural proportions among New York campers retelling the stories.

Other local monster legends exploit human disfigurement or hybrid human-animal creatures to turn up the dial on horror. A man in the Ojai Valley of California became terribly marred by a wildfire and lived as a crazed hermit beneath a bridge. Many young people in the area converged on the bridge at night in hopes of glimpsing the Char-Man, and he sometimes obliged with an attack. When the original bridge site became more populated, the Char-Man and his would-be onlookers migrated to a more remote site. The Goatman has much in common with local camp monsters. He lives (or did) beneath a bridge, was a hermit, and frightened away teenagers when they invaded his territory. In some versions he has a human head and a goat's body; in others, a goat's head on a human body. He may have burned to death when children set fire to his hut, but he continues to frighten motorists driving across his



bridge, sometimes throwing bricks through windshields and occasionally causing a wreck, though he is not a murderer. Nor is he limited to a single locale, having occupied three at the same time and separated by several miles, whereby his reputation expanded until he became recognized as the Maryland Goatman. A sadder case of the San Antonio Donkey Lady concerns a solitary old woman with a beloved donkey who lived in a hut by a bridge. Considered abnormal in her personality and way of life, she became fair game for children who taunted the woman and goaded the donkey. The violence escalated when a mob set fire to her hut, resulting in severe disfigurement so that she resembled a donkey and raising the question of which is the monster, the woman or her persecutors.

A relationship with water or swamps characterizes many legendary local monsters. Turning from camp to campus, the Lake Lieberman Monster enjoyed a storied career from its home in an overgrown slough behind a SUNY-Binghamton residential college. This swampy-lake dweller shared features of the Loch Ness Monster and dragons during its heyday in the 1970s and 1980s. The Webber is a local monster of a town in Newfoundland. Said to have been a very young child when his parents were killed in an accident, he survived in the wilderness, perhaps with the help of an animal, and grew into a web-footed hybrid half human and half reptile. In the late 1860s, one of North America's many lake monsters, serpentine in form but outfitted with legs, excited the Mormon population of Utah. This Bear Lake monster enjoyed considerable newspaper coverage and the promotion of prominent citizens. Sharlie, also like a sea serpent, occupies an Idaho mountain lake with continued sightings, newspaper reports, and popularity in the local Winter Carnival.

Some landlocked creatures on the border between wilderness and human habitation have endangered rural folk for a long time. Frontiersman Daniel Boone is the authority for having killed a hairy creature more than ten feet tall late in the 18th century. This man-ape even had large feet and serves as an anchor-point for cryptozoologists tracing the earliest Bigfoot sightings on record. The Jersey Devil, born in the 1730s to a woman named Leeds, began life as a deformed child so terrible in its actions that his father must have been Satan. He flew up the chimney one day then haunted the Pine Barrens of New Jersey for decades as the Leeds Devil. His depredations suddenly spread until he acquired statewide notoriety as the Jersey Devil in 1909, an-

nounced by frequent newspaper accounts of his antics and portrayals as a skinny horse with bat wings or a dragon-like reptilian Jabberwock.

The most contemporary of widely known monsters deviate somewhat from older legendary models. Mothman and the Chupacabra share a relationship with UFOs. Mothman, a six-foot winged biped with large shining red eyes, flew in pursuit of cars at speeds up to a hundred miles an hour in remote areas around Point Pleasant, West Virginia, from late 1966 to late 1967. The Chupacabra was spawned in conspiracy rumor as either an escaped experimental animal or as an extraterrestrial visitor. This vampiric creature appeared as a canid-like animal to some and to others as a bipedal humanoid three to five feet tall with spikes along its spine and an elongated head with big dark eyes similar to the well-known gray UFO alien. Stories of Chupacabras sucking the blood from livestock spread from Puerto Rico to South America and the southern U.S. The Internet spread and amplified Chupacabra legends, but it created Slender Man, a tall, thin manlike form with abnormally long or tentacle-like limbs, dressed in a black suit and having a face devoid of features. Contrived as an imaginary monster, he flourished in games, comics, and online fantasies, acquiring a following that traded fabricated rumors and becoming real enough for two twelve-year old girls in 2014 that they stabbed a third girl to show their loyalty to the monster. Creepy fiction mutated into bizarre legend and finally sensational fact.

At first sight, these legendary monsters fulfill the usual expectations for all monsters: They are typically ugly, frightening, and unsettling. Most of the time they menace and threaten, and keeping the root meaning of the term "monster," they often warn—of future events, to avoid dangerous places, against violating rules or customs, but with a subtext that bad outcomes are avoidable for those who heed the warning. The monster stories told to campers serve as more than atmospheric entertainment. They intend to instill fear of unfamiliar dark places and bodies of water where accidents can happen, and to keep the kids in their bunks rather than prowling outside at midnight. But not all monsters live to scare. Some are humorous or even endearing when they serve as mascots, expressions of communal pride, or subjects of inside jokes. The Lake Lieberman Monster did not need a murderous rampage to establish his fame, but received it from the campus residence that adopted him and promoted him with fevered student humor and public ceremonies

organized in his honor. Lieby and Sharlie are names that echo affection rather than fear of a threat. Loren Coleman backtracks the alligators in New York City sewers to a 1935 newspaper report. The legend flourished in the 1960s, fleshed out with explanations that small pet alligators brought back from Florida grew too large and were flushed down the toilet, entering the sewers where they grew to monstrous size feeding on rats and sanitation workers. New Yorkers embraced the story with a wink and a nod as a piece of their urban identity.

Monsters may be supernatural, like the earliest versions of the Jersey Devil; but characteristic of most contemporary legends, biological and rationalized actors have supplanted ghosts, demons, and fairies. Modern monsters have very material skin or scale, flesh and bone, feathers or fur. Even so, a sense of the strange and uncanny suffuses them. They are different in ways that transgress the bounds of the ordinary and expected, unnatural like the hybrid goat-man or man-goat of Maryland, against nature like the child that mutated into the half-reptilian Webber. What counts as monstrous about Daniel Boone's hominid is its place in between human and animal categories, unlike any familiar and naturalized species. Add that this creature is big, aggressive, and dangerous, and the result qualifies unmistakably as a monster.

Some monsters are animal, some alien, some unclassifiable, but readers of *North American Monsters* will find that most contemporary examples are all too human. For bygone writers like Homer, Herodotus, and tellers of Medieval travel tales, one had only to journey past familiar bounds to land in the company of monsters. Beyond the known and civilized, natural and social norms broke down. Odysseus, Alexander the Great, and John Mandeville found themselves beset by cyclopes, dog-headed men, people with their faces on their chests, cannibals, and savages once they stepped into unknown territory, and this strand of tradition continues today as outer space provides inexhaustible habitats for alien beings. But meanwhile back on earth, its unknown places have diminished to the point that if Skull Island existed, it would now have its own McDonalds. Such a loss might have spelled disaster for monsters left with nowhere to run, no place to hide, but adaptiveness of human imagination averted the crisis.

Strangers, whether the new kid in school or the immigrant, anyone different in appearance, customs, religion, or just unfamiliar, often meet with

suspicion and rejection. The very term "illegal alien" piles on negative implications of outside the social rules and from another planet. Human deformity in particular has long met with fear, revulsion, and rejection. The Romans recorded monstrous births as portents of disaster; prodigy collectors of the 16th and 17th centuries like Conrad Lycosthenes gathered extravagant claims of the monkfish and pope-ass to further Protestant portrayals of Catholicism as demonic. Teratology, the study of monsters, especially deformed humans, occupied both religious and early scientific thinkers for centuries. Seeming hybrids of human and animal were especial objects of dread, but in recent times beings fully human in appearance have stocked monsterdom with some of its most chilling denizens. Whether in history, the news, literature, or movies, humans repeatedly check all the right boxes for monstrous behavior—Hitler, Stalin, bin Laden; Jack the Ripper, John Wayne Gacy, the school shooter of the week; Dr. Frankenstein, Dr. Mengele, Dr. Strangelove. They look normal but do what is horrid. The human monster replaces distance with dementia, outer difference with inner evil, proper behavior with revolting acts. Anywhere, at any time, a passerby, a neighbor, or the person sitting in the next seat may pull out a gun or be exposed as a serial killer or child molester. The human monster is real enough and raises few "possibility hurdles" for our credulity to overleap. With such undeniable possibilities, we always have monsters in our midst.

Several chapters track the rise of murderous maniacs as the legendary monsters of choice, an adaptation of the legend to secular and realistic expectations influenced by slasher movies and real events. Where deviation of man and beast from physical norms has created many a monster, violation of behavioral, social, and moral norms also sets some people outside the pale of society and human empathy. A crazed killer supplanted aliens and swamp creatures as the preferred Boondocks Monster of 1960s campers. The Cropsey Maniac spent his entire known career as an insane murderer, the Webber's desire to harm stemmed from a traumatic childhood experience. Another characteristic often shared by modern monsters and the reason given for their malevolence is disfigurement, explicit in the Char-Man and Donkey Lady legends. They share along with the Goatman a solitary, anti-social lifestyle, hiding in isolation because of their hideousness, but pursued and persecuted by streams of people seeking to see the freak show. A superficial glance at the Donkey



Lady legend shows only another birth-of-a-monster story, but deeper consideration unfolds layers of social meaning, among them intolerance of a non-conforming person by the normative community, violence to expel an undesirable resident, blaming the victim for her own persecution and injury, revulsion toward a disfigured person, and exploitation of her as a spectacle. The legend reaches beyond an individual case to symbolize the unequal power relationship between marginalized and dominant communities.

Another facet of monster legends to understand is in what sense they are legendary. Why does it matter? Doesn't every story about monsters qualify as a legend because of its subject matter? The monsters of folklore certainly belong to "unofficial knowledge," things the folk public says exist but which science, history, and official news deny. In this sense fairies, ghosts, Bigfoot, Slender Man, and certain crazy killers become folk entities and proper subjects for folk narratives, but not all such narratives are legends. Folklorists distinguish memorates, accounts of personal experiences that sometimes include folk entities, from legends, where the subject matter may be the same entities but further qualifications apply. Legends are not just personal stories. They are stories that have persisted to become traditional. To be legendary, they must be shared knowledge, preserved and actively recirculated as full or partial narratives, or passively carried in memory by people who do not themselves tell the stories but know them and the claims they make. Each account of the same monster contributes to its legend, which comprises all experiences, accounts, retellings, and variants of it. What we see in each monster included in this book, from the most localized camp terror to a widely known creature like the Chupacabra, is a cluster of related but individually different narratives, changing from teller to teller and morphing over the years, but unified by some common characteristics and a community of participants that treats the central figure as one and the same.

These legends have passed primarily as oral traditions, but printed and electronic media have supplemented person-to-person communication with updated grapevines for disseminating talk of the strange. In the 19th century, newspapers became daily or weekly channels that spread the story of the Bear Lake sea serpent, along with countless reports of wild men, prehistoric animals still alive, Fortean phenomena, phantom airships, lunatics on the loose, and improbably large snakes. Newspapers

were sources of entertainment as well as news, and monsters provided sensations that customers paid to read about. The papers printed both stories reported as news and, when news was scarce, fabricated them whole cloth. Production of such "nature faking" articles fell to a newsroom writer designated as the "snake editor." The legend of alligators in the sewers profited from collaborative interactions of oral and press transmission, with helping hands from literature, movies, art, and jokes. Everyone now knows the story. It serves as a distinction, a quirky New York identity feature, even a source of humorous pride.

With the advent of electronic media, the spread and penetration of legendary material into public awareness redoubled—and as stories passed back and forth between folk and mass or popular culture, distinctions between the cultures blurred almost beyond recognition. Puglia focused on monsters as folk tradition and excluded from the book's purview such literary and cinematic figures as Dracula or Jason from *Friday the 13th* movies, but he acknowledged that their inescapable influence has shaped contemporary folklore. In a chapter on "American Vampires," an investigation of college students found that some knowledge of these monsters traced to Bram Stoker's novel, but still more derived from classic Bela Lugosi movies seen on TV late shows and from a TV series current at the time. How vampires look, dress, and become undead reflected information received via "tube transmission." None came directly from folk traditions. Rather than an obituary for folk vampires, their media attention nurtured a pop culture rebirth so appealing that some survey respondents believed vampires exist and even identified as one. Vampire admirers and imitators respond to the immortality, power, and sexual allure of this fictitious role model, one that symbolizes American values of youth, success, and sexual prowess, and to the romanticized media image of a tragic hero who lives by his or her own rules. The supernatural and monstrous can thrive without a community, in the usual folk sense, when a media-dominated environment connects disparate individuals into a quasi-community where nothing more than their fantasies intersect.

No example better illustrates how the Internet drives innovation in monster-making than the Slender Man saga. Dr. Frankenstein brought his monster to life with a piecemeal body, a spare brain, and lightning. Slender Man began in a group effort to create a scary pseudo-legend by assembling various

ideas to resemble the real thing. Made of imagination and supported by photos, news reports, and rumors, all fake, he emerged using no more electricity than needed to e-mail a forum network. The tall blank-faced figure and ominous associations with a fire and vanishing children struck a chord with recipients, who began adding to the fiction, interpreting and discussing it as if it were real, and spreading it to an ever-wider audience that responded as participants and sometimes believers. Computer networking allowed a collective creative and editing process among this far-flung, largely anonymous community. Online variants circulated and faced criticism when narrators' versions went against majority expectations among the audience. Negotiations, the clash of custom and creativity, worked out the differences with reconciliation or a parting of the ways, as happens in face-to-face folklore. Slender Man's popularity gained him entrance into such popular culture channels as games and movies, and into real-life news and an HBO documentary after the legend led to attempted murder. Here another monster came to life and escaped control of his creator—and this time his home was cyberspace.

How old and ethnic traditions fare against mass-culture interests is a subject for two chapters. From *Night of the Living Dead* to the *Walking Dead* franchise, the zombie has become a superstar of movies and TV in the U.S. and internationally. A rotting, lurching body and mindless quest for brains or flesh to eat define these creatures, and images of their tireless hordes overrunning civilization sustain the cultural meme of a zombie apocalypse. Their brainlessness invites humor and their convergence on malls out of postmortem habit serves as a heavy-handed dig at American consumerism. Like vampires, zombies have authentic folk roots; also like with vampires, few folk elements survive the transition to popular icon. The zombie of Haiti has a deep folk and religious presence in differing local forms throughout the country, but a key characteristic, the distinction between captivity of the body and of the soul, remains unknown in popular-culture representations. Another indigenous entity with a checkered modern history is the windigo, widespread among native peoples of Canada. Though human in form, the traditional monster was several times taller than a man but very thin and bony, forever hungry, ashen gray with eyes deep in their sockets, and tattered bloody lips. It was a giant cannibal that hunted humans or an evil spirit that turned humans into cannibals, but also a religious figure that

cautioned against selfishness and reminded people that communal relationships were important. In mass culture the windigo became a one-dimensional agent of death and evil, probably an influence on the icy White Walkers in *Game of Thrones*. The creature stripped down to its horrific image set off on a new career in Hollywood, while some Indigenous authors rewrote it as an avaricious monster underneath a handsome human façade to criticize capitalism and commercialism. The tradition split as it adapted to differing cultures and concerns.

A similar dynamic of conflicting interests has played out over Mothman. He gained sensationalized appeal through John Keel's book, *The Mothman Prophecies*, and much wider recognition through the movie of the same name. Keel amplified the weirdness while the movie made sparing use of the actual monster and concentrated on a mood of continuous and effective foreboding. Both of these treatments offended one faction of local residents. The Mothman festivals that followed the movie brought tourists to Point Pleasant; but for people who lived through the Silver Bridge collapse, it remained traumatic, sacred, and still surrounded by an aura of the preternatural. Not the monster but the tragedy was what mattered. For the festival promoters, for people too young to remember, and for anyone who welcomed the money that came to town, the fun and excitement of the festivities overshadowed the solemn memory of the disaster. Two strands of memory diverged, one that enshrined history, another that embraced the paranormal, the carnivalesque, and the commercial.

A legend may have a lengthy tradition with deep historical roots. Vampires and water monsters are widespread and age-old, the Jersey Devil has been around for hundreds of years, and the Donkey Lady bears similarities to the La Llorona legend, the Goatman loose ties to the Great God Pan. Still, as legends go, the typical local monster has a shallow and self-referencing lineage. Individual narratives tell of a sighting or encounter, followed by running and screaming perhaps, but the story is usually short on plot. The legendary character of a monster legend is mostly a summation of memorates, background history explaining origins and motives, and third-person accounts where the first persons are no longer alive to speak for themselves. Few local monster narratives evolve the structural distinctiveness of familiar contemporary legends like *The Boyfriend's Death*, *The Hook*, and *The Killer Upstairs*, though some plagiarize it. Especially in cases where the lo-

cal monster is a crazy killer, narrators may graft the plots of these legends onto their stories as a way to add a dimension of drama. But overall, the traditional content of monster legends remains limited to descriptions and a few generic events.

Certain distinctive motifs also recur in monster legends old and new. Types and appearances of monsters show a convergence of thinking attributable to traditional models, but the repetition of bridges in the Char-Man, Goatman, Donkey Lady, and Mothman legends seems an unlikely coincidence. A bridge can serve as home base for crazed, solitary, and ostracized characters, and did make sense as the focal point for portentous events after the bridge collapse at Point Pleasant, but these instances share no self-evident connections. On deeper consideration, monsters are liminal creatures. They belong on the threshold between the known and the unknown, the realm of human rules and understanding versus the inscrutable and uncontrolled. The bridge stands between the safe side of the human protagonist and the dangerous side of the monster, and it brings them together for inevitable conflict. Such recurrent features hint of deep traditions, currents of symbolism or cognitive patterns liable to surface in unexpected places.

The legend trip suggests a primal lure of confrontation and combat when people, often teenagers, seek out the haunts of monsters in hope of engagement with the frightening Other. Though few believe the monster is real, a setting that includes darkness, remoteness, perhaps a bridge, ruin, or graveyard, perhaps the Halloween season and plenty of stories to set the mood, primes the questers for anything that goes bump in the night. With other teenagers at large in the area, a volunteer monster or two may assure that everyone will have the desired fright. On the darker side, such trips overlook the exploitation of otherness and misfortune for the sake of thrills, but social and ethical considerations are too cerebral for the immediate purpose of these excursions. They provide communal participation, excitement in localities where other sources are limited, an irresistible test of courage, and an experience that reaffirms both specific legends and ingrained, even universal ways of thinking about the monstrous.

Are legends true? Popular opinion says yes; scholars say no, or hedge that there might be a kernel of truth surrounded by much fiction. A more tractable criterion for defining the legend allows that some people believe it is true, or that it is believable even if false. Though monster legends may

stretch credulity, they seem plausible enough to win over some believers while others doubt, leading to a dialectic over pros and cons, alternate understandings and different meanings. Such discussions keep the legend alive as a matter of continuing interest. They shaped the Slender Man conversation in ways that had real consequences for the two girls who believed it enough to attempt murder, and for their victim. Campers may not take their local monster seriously, but if the possibility is enough to keep them inside and out of trouble at night, the legend has had the desired effect on them. Legend trippers get a thrill of adventure out of monsters they laugh at by daylight and only briefly suspend disbelief at night. For a friendlier monster like Lieby, his ontological status was as certain as it was irrelevant. The students who boosted his fame knew he was fictitious and played along, willfully pretending he was real for his services to campus fun and humor.

Monsters live when people believe in them, but then belief in the monster itself is not the only perpetuator of the legend. As long as monsters hold meaning for the individual and community—be it as reality, expression, symbol, commercial prop, group identity, source of humor, entertainment, or excitement—then the legend thrives. Its truth need not be objective as long as the story embeds social codes and enacts the concerns of the community that preserves it. The legendary monster has a social reality whether it exists or not, and its substantiveness is as real as the actions and beliefs it inspires.

In a sense, all monsters exist as willful human creations. They become our way to give form to the shapeless dangers and names to the sources of the fears that forever stalk us. The older monsters were conceived as physical animals and belonged to the wild unknown. By rendering them physical, we reduced them to mortal creatures and they assumed mortal weaknesses, no matter how strong and fierce. By the old magic of naming, we drew them, however unwelcome, into the human sphere where they fell subject to social rules and assailable by physical power, no longer either supernature or superman. The human monsters that replaced the older vessels of fear simply adapted to the urban jungle that replaced the natural one as the prevailing arena of danger. Again we knew the names and faces of our monsters, and ways to deal with them. Technology has opened the new unknown and already we have filled it with monsters—nuclear weapons, radioactive mutants, space aliens, genetic engineering, robots, androids, sentient computers, runaway ap-

pliances, artificial intelligence, Big Brother, thought control, the Matrix, and novel ones yet to come. The Internet, our new backyard fence for rumors, beliefs, and legends, spreads the word and invites participation in imaginary monsters and endless conspiracies. Anyone can now choose his or her truth according to individual preferences, and, for the still dissatisfied, create their own in an ideational ecosystem of one.

Still, the old monsters retain their appeal. A stubborn romantic spirit still drives people into the forest in search of Bigfoot. One chapter author in the book, Lisa Gabbert, confessed her sighting of something in Payette Lake that might have been Sharlie. Thousands of people every year report UFO sightings to MUFON and NUFORC. Even in this ostensibly secular, disenchanting, materialistic, and tech-savvy age, many people crave the mysterious and want to believe in things unknown to science. Legend trips fulfill a desire to experience the paranormal in person rather than on TV, while monster festivals allow people to play with monsters, make friends with them, and enjoy the fun in relative safety. But the element of fear continues to underlie the monstrous, ready to rear up again at any time in legends, movies, or the midnight hour to touch us with a primal chill. The scientific truth may be out there, but the more compelling truth is within us, even when it is imaginary.

Some wisdom derived from this book holds particular value for anomalists and anyone else dealing with anecdotal evidence. The truth of witness testimony is a slippery matter. Too many contenders claim the authority to decide what is true without awareness of their own shortcomings. Rather than privilege the viewpoints of non-witnesses, cultural outsiders, or those whose made-up minds think they already know the answer, a better approach is to center inquiry on the experience as a witness describes it. This experience-centered approach advocated by folklorist David Hufford recognizes that no one has a God's-eye view of what really happened, but we can know what the witness says happened. A long gauntlet through perception, conception, memory, interpretation, adaptation, and verbalization separates the objective event from the version communicated by the witness, with opportunities for error, distortion, and motivated alteration all along the way. The experience may be misperceived or misconceived from the start. Then too, it may involve something quite real even if the reality is not what the witness thinks. Of course observations work reliably enough that we get through most days

unscathed, but the more unknown and unfamiliar the experience, the less certain its account may be. No method opens a window to objective truth, but starting with the experience sets inquiry off as close to the actual event as we can hope to come.

For historians and monster hunters alike, understanding how witnesses experience their monsters should be a priority concern. Were they eyewitnesses or did they repeat a hearsay account? Chances are they brought expectations to the experience, memories of a local legend or what the movies show, evidence for exposure to prior traditions. After the fact, they try to make sense of what they saw, how to categorize it, how to put it into words, how to reconcile facts with personal beliefs or agendas. Communication means placing personal experience at the mercy of an audience with its own expectations and agendas. This confrontation may pressure the narrator to conform to cultural norms of the community, attend to local tensions and anxieties, repeat prejudices coded in legend traditions, or try to impress listeners with an exaggerated self-image as the hero who confronted a monster.

These considerations assume the narrator even intends to tell the truth. That is not always a safe assumption. In his chapter on monster stories from Southern Appalachia, Carl Lindahl notes that the narratives span a spectrum of complexity and credibility from sightings (simple reports of seeing a creature), legends (accounts of an interaction with a plot), tall tales (longer and more detailed stories with questionable aspects but treated with tolerance), and unreasonable lies (stories so unbelievable that everyone knows they are fiction). Daniel Boone's story of a hairy giant reads like a Bigfoot encounter and has been taken for such, but it includes an extended plot as the monster nearly kills Boone's son, Boone kills the assailant in the nick of time, and he undertakes an autopsy of the dead monster. The result is a thrilling story but likely a tall tale. Its plot is stylized and the action paced. Fictitious details embellish it but do not stretch credulity to the breaking point. Even if it has a kernel of truth, Boone's version aims not to report facts but to entertain. Motives like entertainment, self-aggrandizement, profit, and fooling an audience clash head-on with factual honesty to raise witness reliability as a vital concern.

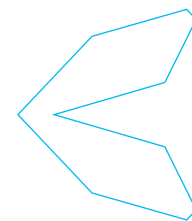
A chapter on "Sasquatch-Like Creatures in Newfoundland" introduces the issue of how to inquire about extraordinary phenomena. The author, Michael Taft, begins by wondering why Sasquatches are not reported in Newfoundland. The province has



an abundance of supernatural and monstrous beings and ample gifted raconteurs, but no tradition of a Sasquatch or any identical being by another name. Old reports of giant Indians, a ghostly guardian of pirate treasure, a gorilla, and exceptional bears in the woods share certain characteristics of the Sasquatch. Are all such reports due to bears, or is Sasquatch lurking around after all and do the witnesses, bound by the categories they have learned, rationalize their experiences in acceptable terms? Language not only provides the vocabulary to describe an experience, it also teaches how to see, what to expect, what is and is not real. It sets limits on possibilities. British folklorist Gillian Bennett doing fieldwork asked people if they had seen ghosts and got only negative responses. Ready to give up, she changed the question to “what do you know about the stranger side of life,” and her informants suddenly opened up about their extranormal experiences. Maybe “ghost” was a pejorative term that indicated superstitious ignorance to which no one would admit, or a category that did not fit the experience as witnesses understood it. But she too found that cultural filters in a given place and time made all the difference in the answers she received.

North American Monsters is a teaching book of the best sort. Students meet the basics of folk legend theory in an engaging context, anomalists have their eyes opened to the social pressures and ulte-

rior motives underlying historic and contemporary monster reports. Everyone learns to think ethnographically, to look beyond the monster in the story and understand how it belongs to its community. Getting to know the people, their economic problems and social concerns, traditions and history no longer seems like a waste of time: To know the culture is essential to know the creature. The reader also pauses in amazement at the complexity of our monstrous frenemies. They pose as the ultimate outsiders, the irreducible Others; but the visible monster is only at the tip of a long thread of relationships that ties them to enduring human issues, and for that reason they are our always—and often uncomfortable—companions through life. To mention one last lesson from the book, we can enjoy the scare and thrill but also appreciate that monsters drive our thoughts beyond the everyday, raise doubts about the settled order and intimations of a bigger, stranger world that stretches our minds to imagine. Perhaps that is the most generous gift our monsters give us. This book is also a generous gift. It says much and suggests far more, stirring up ideas that echo back and forth in mind long after the reader turns the last page. David Puglia and his band of authors inform and delight in heaping measures and deserve well-earned thanks. Feel none of that gratitude and though you yet walk, know your heart and mind and soul have already joined the dead.



LETTER TO THE
EDITOR

Comments on Watson's "Empirical Analysis of the Hugh Gray 'Nessie' Photograph"

Bruce Champagne

I would like to comment on Watson's interesting paper on the subject of the 1933, Hugh Gray, Loch Ness photograph that appeared in the Summer issue of this journal (Watson, 2022). Having a couple of Roland Watson's books in my personal library (which I strongly recommend) and having corresponded with him for his opinion and thoughts in my own research, I can assure the reader that Watson has a significant knowledge of the history and current thought on the subject of the Loch Ness Monster (LNM) and other unidentified aquatic megafauna of the area. I would suggest this paper would benefit, and the proposals strengthened, with a greater and more consistent application and methodology (Heuvelmans, 1988) and a greater effort toward explanations of any imbalance.

DISCOUNTING THE WITNESS

An initial inference is that Watson asks the reader to discount the witness's narrative but accept his. If Gray's minutes-long account should be disregarded in whole or part, it could be helpful to understand why it should be accepted at all, and why Watson's interpretation is preferable over Gray's eyewitness report or any of the other cited suggestions. This exercise is critical, as Watson's proposal could not stand unless Gray's narrative is discounted.

It must be remembered the photograph captured only a split second of time, not the entirety of Gray's experience. Gray reportedly watched the target object for a "few minutes" under bright sunlight at a researched distance of 32–50 m. Under such conditions, it would be reasonable to expect Gray would have been able to identify, at some point, a swan or other bird, a swimming dog, bobbing log, otter, or extraordinary invertebrate. Though Watson identified a head, Gray said he never saw the creature's head.

Allowably, eyewitness reports can be challenging to analyze. A witness can be honest and certain, but still mistaken. Not only can witness recall be influenced by their selective or global attention of an event (Vickers, 2007), but also by the presence of a bias or schema used to interpret any ambiguous information associated with the event (Tuckey & Brewer, 2003).

In my previous studies of unknown aquatic megafauna, I noted a need for a more robust methodology to evaluate the quality, credibility, and usefulness of an observation, before any inclusion into a dataset for subsequent analysis, and developed a rating scale upon which each observation was subjected (Champagne, 2007, 2016). I realized actual observations could be discounted and errors could be included, but understood the importance of applying a consistent, defensible, and repeatable system of data quality control. Using that methodology and the information provided by this paper, at best Gray's

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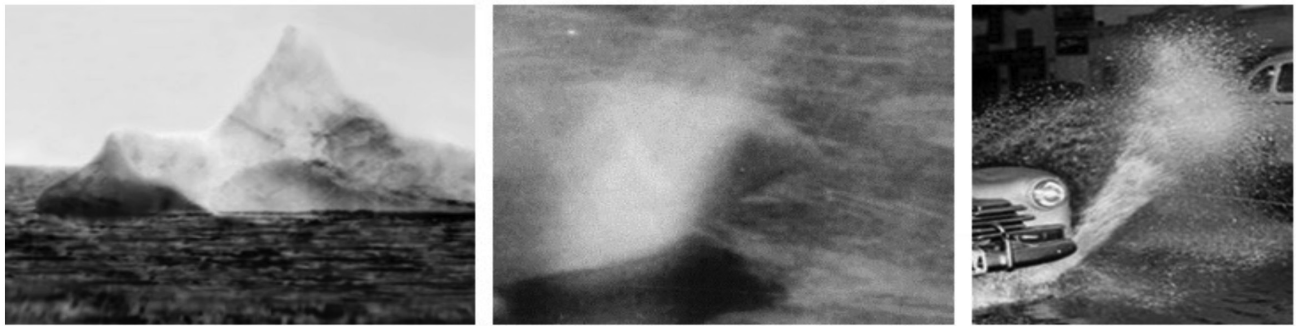


Figure 1. Comparison of the Palmer Titanic iceberg photo (left), the Gray photograph (center), and a period photograph (right).

observation would have scored the minimum rating for a debatable inclusion into the unknown aquatic megafauna dataset.

CAMERA CAPABILITY

Watson's proposal is also dependent on the capabilities and limitations of the camera Gray used to photograph the target subject. Some allowance was made for overexposure; however, Watson's proposal suggests Gray's photograph captures spraying water, which necessarily obstructs or influences not only Gray's view at the time but also anyone else's subsequent examination of the photograph.

Understanding the capacity of the camera to capture the image under the conditions both known and estimated would support Watson's conclusions. Though the camera is not specifically identified, apparently the photograph negative was examined by Mr. M. Howard of Kodak and Mr. C. Clarke of the *Kodak Magazine*. Because of that association, and the fact the popular Kodak Brownie box camera was manufactured by the Eastman Kodak Company during that period (Gustavson, 2009, 2011), it could be that Gray used one of the affordable 120 film camera models of the time to produce the questioned photograph.

It is unknown if Gray used a tripod, but it could be assumed he understood he may have had limited time to photograph the unique target subject, and rather than taking the time to mount his camera on a tripod, held the camera by hand to ensure he had time to photograph the subject. As a result, the resulting photographs may have been affected by camera movement. The camera would also have been subject to overexposure. The Kodak box camera user's manual of that period advised that under the sunlight conditions Gray reported, "The shutter can hardly be opened and closed quickly enough to

avoid over-exposure" (Kodak).

With informal research, I confirmed that the period Brownie box camera was capable of capturing moving, spraying water, and was indeed, subject to overexposure and artifacts (Figure 1).

My personal observation is that the Gray photograph is more consistent with the effects of overexposure rather than the display of airborne water.

PAREIDOLIA AND COGNITIVE BIAS

Watson suggests the counterproposals are the reflection of pareidolia, apparently because they disagree with his proposal and their suggestions required drawings and image outlining in support. I would agree with Watson that the skeptical exercises and alternative proposals are biased, incomplete, poorly demonstrated, and/or otherwise implausible—in essence, pseudoscience. However, Watson uses the same outlining application as the counterproposals he is critical of.

Unfortunately, circling and outlining are common in the study of hypothetical species. To prime a recognition (Bourne & Ekstrand, 1985), dark shadows in forests and thick vegetation are routinely circled to identify the hiding relict hominoids within them, and outlines direct our recognition of unknown animals from the ambiguous shapes in, and contours of, water.

Naish (2016, 2021) is an educated skeptic, and Watson and the other participants are active investigators of the LNM. Like any human being, each is subject to bias. Daniel Schacter (2002) reflected:

“. . . the various forms of bias are so deeply embedded in human cognition that few good remedies exist for overcoming or avoiding them altogether. Perhaps the best we can do is to appreciate that cur-

rent knowledge, beliefs, and feeling can influence our recollections of the past and shape our impressions of people and objects in the present. By exercising due vigilance, and recognizing the possible sources of our convictions about past and present, we can reduce the distortions. . .

With the same photograph producing such varied proposals, I would suggest each participant demonstrated a cognitive bias and prototype matching with their individual proposals and arguments. This reminded me of the Jastrow 1899 Rabbit–Duck Experiment.

Psychologist Joseph Jastrow examined human perception and the associated visual processing, and how it related to our interpretation of our environment. Jastrow used drawings and optical illusions to illustrate his argument that what is actually perceived is dependent on our mental and emotional states and how we experience and view our environment (Jastrow, 1900). Jastrow conducted well-known experiments with the ambiguous drawing of a rabbit or duck to support his observations (Figure 2). Which do you see? A rabbit, or a duck?

One would expect that not only the Gray photograph but also the individual proposals about it should be able to stand on their own merits without outlined interpretations, drawings, or photographic overlays. I informally asked seven adults to individually identify anything they observed in the Gray photograph. None of them had ever seen the photograph and had no interest in unknown aquatic megafauna. Answers ranged from reflected light, an x-ray, an ultrasound image, a whale (though not

consistent with Watson’s drawing), or had no idea. Interestingly, the person reporting an ultrasound image had just been discussing them minutes before the exercise. No one reported seeing a swan, dog, or unknown serpent.

CONSILIENCE AND CONSISTENCY

Perhaps, future skeptical examinations could strive for consilience of independent and historic data (Laudan, 1981), and objective analyses could improve the consistency of critique and application. And perhaps, the Gray photograph should remain inconclusive and unidentified for the time being.

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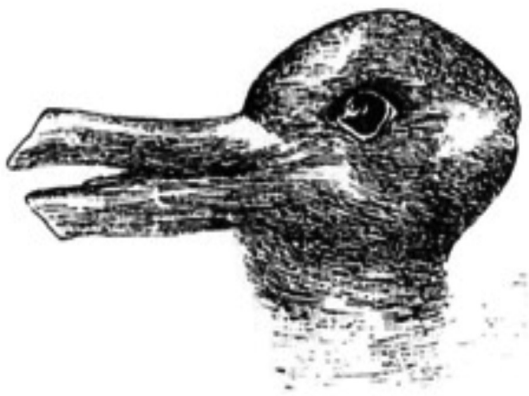
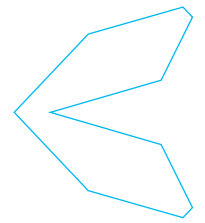


Figure 2. Jastrow’s Rabbit–Duck (Jastrow, 1900).



LETTER TO THE
EDITOR

Reply to Champagne's Comments on "Empirical Analysis of the Hugh Gray 'Nessie' Photograph"

Roland Watson

Thank you to Bruce Champagne for his observations (Champagne, 2022) about my research article (Watson, 2022), to which I add some comments here.

The matter of Hugh Gray stating he saw no head versus what others see in his photograph is indeed a conflict requiring resolution. The simple solution is to discount all but Gray's words as flawed. But this makes the assumption that eyewitnesses always perfectly describe what they see. Normally the imperfections of human observation and recall is used to reject all eyewitness testimony as inadmissible as evidence. But what I propose is that one can be an eyewitness to a large creature but still describe it imperfectly. Indeed, it should be the default position that every account has some degree of inaccuracy.

This is seen in cases of sightings with multiple eyewitnesses whose descriptions have degrees of variance. One example is from 22nd September 22, 1933, when ten eyewitnesses describe seeing a long-necked creature with humps (Loch Ness Monster, 2021). Four sketches were produced which had variations. Indeed, one sketch omits the humps and another adds a frilly mane to the neck. This does not detract from the collective claim of seeing a long-necked animal with humps, no more than four people producing different sketches of a distant boat proves they did not see a boat.

So when Bruce asks why readers should discount Hugh Gray's account and accept mine, it is because we have two accounts, one from Hugh Gray and one from his camera. To use the example above, they both "saw" the same thing but produced different "sketches." The camera is taken to be a less imperfect recorder than Hugh Gray and has a right to be heard. When Bruce says Gray reportedly watched the object for a "few minutes" in bright sunlight at 50 metres, this is not strictly true. It was stated as appearing for a few minutes before sinking out of sight. Hugh Gray was not intently staring at the creature for this duration and this led to imperfections in his final account when compared to the "account" given by the camera.

My original article takes steps to highlight how Gray was distracted in his observations. These were watching the object through a small viewfinder, changing plates four times and water spray obscuring features whatever the light conditions were. I refer again to the words of Constance Whyte in my article. Gray's unhindered stare time may have been quite brief. All this in no way is a pretext for rejecting all of Hugh Gray's testimony. Eyewitnesses will state inaccuracies but this does not mean they did not see what they claim.

Moving onto Bruce's opinion that the spray beside the head is a camera overexposure, I do not accept this based on analysis of the overall photograph. There are various smudges across the picture that are indicative of patches of overexposure, but they lack the structure of the area I propose is the spray water described in the account. It is seen emanating from the line where the object meets water and even is seen in the lighter reflection in the water below. In my opinion, it is more complex compared to the

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incoherent overexposures elsewhere. The comparison photographs of spray that Bruce produces are useful only insofar as they go. It cannot be assumed that these are representative of all possible forms of dispersed water.

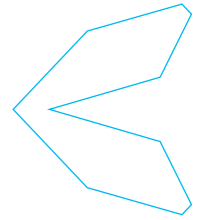
Finally, regarding pareidolia and cognitive bias, I would first say that my inclusion of a drawing to highlight the head features was not a tactic to counter the possibility that the features were not really there. It was the best tool in my opinion to describe what I wished to discuss further. It may have been better if I had textually described the location of each proposed feature? However, my main defence of the head being there was the three contemporary newspaper features from 1933 that independently state they also see a head in that area. How many independent confirmations are required to exclude pareidolia? Bruce's employment of seven adults to ask what they saw in the Gray photograph may be a useful exercise, but I was surprised most or some could not recognise the surface of water. If they cannot identify water in the picture, what hope for the object? I would rather regard the three newspaper features above as more telling. The presence of cognitive bias is acknowledged, but then

again what is gained from saying this if it is present in everyone, including Bruce himself? I would prefer to simply take people's words at face value and critique them accordingly. Jastrow's duck-rabbit drawing is a clever illustration, but is it normative of ambiguity in images, or an exaggerated example to force home the possibilities of ambiguity? If I am seeing a "duck" in the Hugh Gray image, then what is the "rabbit"?

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OBITUARY

Frank Drake “The Father of SETI”, May 28, 1930 to September 2, 2022

Jeremy J. Drake

Center for Astrophysics: Harvard &
Smithsonian

Frank Drake was a hero, a legend, an icon. His eponymous Drake Equation was the catalyst for SETI—the search for extraterrestrial intelligence—and is often called the second most famous equation in physics, right up there with $E = mc^2$. His name is recognized by high school students—in a pantheon that includes luminaries such as Newton, Einstein, Gauss, Maxwell, Planck, Boltzmann . . .



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Figure 1. Frank Drake, founder of the search for extraterrestrial intelligence (SETI), poses for a portrait at his home in Aptos, Calif., on February 27, 2015. Photo credit: [Ramin Rahimian for the Washington Post via Getty Images](#)

I was, in fact, in high school when I first learned of the Drake Equation. “Are you any relation to . . . ?” No, I’m afraid not . . . “Drake” is not a very unusual name, but it’s not so common either. Perhaps because of this, I have always felt some sort of tenuous connection with other Drakes. Being an astrophysicist myself, I felt this with Frank Drake even more so, though I never met him personally. The closest I got was an email exchange in the mid-1990s when I invited him to give a seminar at the University of California, Berkeley, where I was working at the time. He was a professor and dean at the University of California, Santa Cruz, and unfortunately too booked up to make it.

Drake came up with his equation in 1961 to serve as a loose agenda for a now-fabled meeting he hosted at the National Radio Astronomy Observatory (NRAO) in Greenbank, Virginia. The purpose of the meeting was to bring together top scientists in relevant fields of research, such as astrophysics, biochemistry, chemistry, and biology, to quan-

tify the chances of SETI successfully detecting intelligent life beyond Earth. Among the dozen or so attendees were three Nobel Prize winners—Melvin Calvin was actually informed of his Nobel Prize in Chemistry during the meeting—and one young planetary scientist named Carl Sagan who would become a lifelong friend and colleague.

Drake, only three years on from his PhD, had brought SETI from a taboo subject prone to ridicule to one of serious scientific study.

Frank Donald Drake was born in Chicago in 1930 and was the oldest of three siblings. His mother was a music teacher, and his father a chemical engineer whom she met when they were students at the University of Illinois. The young Drake became interested in science while still a child, frequently cycling to Chicago's Museum of Science & Industry, and later dabbling with chemistry and making radios with friends. One of the exhibits at the museum that made an impression on the young Frank Drake was of our Milky Way galaxy, showing that our Sun is only an average star among billions. His interest in astronomy kindled, in his teens he constructed a telescope in the basement of the Drake residence.

At age 17, Drake took up a Naval Reserve Officer Training Corps scholarship to study at Cornell, earning a bachelor's degree in engineering physics in 1952. It was there that his interest in extraterrestrial life began after attending a lecture course on planetary system formation by renowned astronomer Otto Struve. Struve was one of the few professional astronomers of the time who promoted the idea that intelligent life was common in the Universe.

From 1952 to 1955, Drake was an electronics officer in the U.S. Navy, serving briefly on the Sixth Fleet's flagship heavy cruiser *USS Albany*. He then studied for a PhD at Harvard University under the supervision of the great Cecilia Payne-Gaposhkin, the pioneering spectroscopist who first worked out that stars—and the Universe—are primarily composed of hydrogen and helium. Drake graduated in 1958 with a thesis titled "Neutral Hydrogen in Galactic Clusters" looking at the 21 cm line of hydrogen that results from the spin flip of its electron to learn more about how star clusters form.

A PhD at Harvard in the newly emerging field of radio astronomy would have been a natural scientific choice for Drake. The 21 cm line had been predicted only 10 years earlier by Dutch astronomer and mathematician Hendrik van der Hulst and was first detected by Harvard scientists in 1951. Bart Bok, the astronomy department chairman at the time, was also keen to employ Drake's electrical skills for maintaining and developing equipment. Drake became one of the first PhDs in radio astronomy and in 1958 was well placed to take up a position of staff astron-

omer and head of telescope operations at the recently commissioned NRAO at Green Bank, West Virginia.

Drake would stay at NRAO for the next 5 years, publishing several important papers on the radio emission from planets. He was among the first to discover the radiation belts of Jupiter, and the high surface temperature of Venus—nearly 500 °C—and realize this was due to the atmospheric greenhouse effect. Drake summarized this work in a 1961 *Physics Today* article (Drake, 1961a, p. 30) and later wrote a review of planetary radio astronomy for the *Proceedings of the National Academy of Sciences* (Drake, 1963). This research was seminal in radio astronomy, but it was not this work for which Drake would become an almost household name.

Otto Struve had become the NRAO director in the summer of 1959 and enthusiastically endorsed an audacious proposal by Frank Drake to use a radio telescope to search for signals from intelligent life on planets around other stars. Drake named it Project Ozma, after the L. Frank Baum character Princess Ozma, ruler of the land of Oz. It used the newly built 85-ft. Howard E. Tatal Telescope that Drake tuned to observe in frequencies around 1420 MHz, close to the 21 cm line of hydrogen, reasoning that it would be an obvious choice for a civilization aiming to make radio contact with other technologically advanced worlds looking out into space. He spent a total of 150 hours over several weeks in the spring of 1960 pointing the telescope alternately at the two nearest northern hemisphere solar-type stars to us, τ Ceti and ϵ Eridani, but no signals were found. Drake described Project Ozma and the reasoning behind it in another *Physics Today* article in 1961 (Drake, 1961b, p. 40).

The subject of intelligent life beyond Earth was considered somewhat renegade by the astronomical community at the time, and Drake and Struve had originally intended to keep the project secret. Drake changed his mind when he became aware of a paper published in *Nature* by Cornell University scientists Giuseppe Cocconi and Philip Morrison titled "Searching for Interstellar Communications" (Cocconi & Morrison, 1959). Cocconi and Morrison reasoned that extraterrestrial intelligence would likely attempt to communicate with other planetary systems at radio wavelengths that can penetrate the gas and dust in the Milky Way—precisely what Drake had planned to look for. The publication prompted Drake to make Project Ozma known to the press and it subsequently garnered significant worldwide public attention. Peter Pearman, a biologist on the Space Science Board of the NAS, also took note. Despite the null result, Pearman was excited about Project Ozma and asked Drake to organize the now-famous meeting at Greenbank.



Figure 2. Frank Drake in front of the NRAO 85-foot Howard E. Tatel telescope that he used for Project Ozma. Image credit: NRAO/AUI/NSF.

Drake found he “could reduce the whole agenda for the meeting to a single line” (Drake & Sobel, 1992). That line was

$$N = R_{\star} f_p n_e f_l f_i f_c L.$$

Now widespread in popular culture, the Drake Equation can be found on T-shirts, mugs, the sides of boats, wall hangings, and countless other media. It is a simple multiplication of factors, but it cleanly encapsulates the relevant variables and splits the problem into its constituent parts. The point of the equation is to provide an estimate for N , the number of detectable civilizations in space. The answer is the product of R_{\star} , the star formation rate, f_p , the fraction of stars with planets, n_e , the average number of planets per stellar system with conditions suitable for life, f_l , the fraction of those planets on which life emerges, f_i , the fraction of life-hosting planets that develop intelligent civilizations, f_c , the fraction of intelligent civilizations that develop technology to generate signals or emission we can detect, and L , the length of time the civilization remains detectable.

During each session of the Greenbank meeting, a different factor of the equation was examined. Of these factors, R_{\star} , f_p , and n_e can, at least in principle, be measured. But at the time of the meeting only the star formation rate was known. That number for the Milky Way has been

honed over the years and stands at about 2 solar masses per year. Thanks to the remarkable exoplanet discoveries in the last decade by missions such as *Kepler* and *TESS*, the fraction of Sun-like stars with habitable planets is known to be about 50%. This equates to approximately 4 potentially habitable planets around Sun-like stars within the nearest 30 light years and two billion or so in the Milky Way galaxy. Extending this to the lower mass M dwarf stars increases that number by an order of magnitude. Although they could not have been sure of their guesses, the values for R_{\star} , f_p , and n_e adopted by Drake and colleagues at the Greenbank meeting are within a factor of 2 or so of those estimated today.

It is the remaining factors that are more controversial and unconstrained. The Greenbank meeting consensus was that every habitable planet would develop intelligent life and that 10–20% of those would communicate, with the result that $N \approx L$, with L in years. Drake himself favored a value of 10,000 years, implying that there are approximately 10,000 civilizations in the Galaxy with detectable transmissions.

That was the birth of SETI. Drake was made president of the SETI Institute when it was finally founded in 1984 and would be an enthusiastic supporter and contributor for the rest of his life.

Drake eventually moved on from NRAO to become the chief of the Lunar and Planetary Science section of the Jet Propulsion Laboratory in California in 1963. Unhappy with the bureaucratic load, he soon relocated to Cornell University, taking up a faculty position in 1964. He would spend the next two decades at Cornell, gaining promotion to Goldwin Smith Professor of Astronomy in 1976. Between 1966 and 1968, Drake worked in Puerto Rico as director of Cornell’s giant Arecibo radio telescope—the world’s largest single-aperture telescope at the time. From 1971 to 1981, he was director of the National Astronomy and Ionosphere Center at Cornell, where he continued his oversight of Arecibo and supervised upgrades to the dish’s surface and instrumentation.

The years 1972 and 1973 saw the launches of the NASA Pioneer 10 and 11 probes to study the asteroid belt, Jupiter, and Saturn. Each carried a special 9” x 6” plaque made of gold-anodized aluminium engraved to a design by Drake, Carl Sagan, and Linda Salzman Sagan. The design featured human male and female figures, together with various symbols depicting the 21 cm transition in hydrogen, the solar system, the position of the Sun relative to fourteen different radio pulsars and the Galactic Center, and an outline of the Pioneer spacecraft.

In 1974, Drake used the Arecibo telescope to make the first attempt at communicating with extraterrestrial civilizations. This became known as the “Arecibo mes-

sage” and was beamed toward the M13 globular cluster 22,000 light years distant. It contained encoded data including the Earth’s position in the Solar System, and information on the human race and DNA. This was followed in 1976 with design work to develop the “Voyager Golden Record” with a panel chaired by Carl Sagan. The Golden Record, made of gold-plated copper, was flown on both Voyager 1 and 2 missions to the outer Solar System and was the next step after the Pioneer plaque. It included audio recordings and analogue-encoded pictures that could be retrieved by playing the disc like a vinyl record. The record was encased in aluminium that included a sample of uranium-238. This isotope has a half-life of 4.5 billion years, and the idea was that its decay products could be used to determine the age of the spacecraft if it were ever found in the distant future.



Figure 3. The binary code “Arecibo Message” beamed toward the globular cluster Messier 13 at a ceremony for the remodeling of the Puerto Rico Arecibo Telescope on November 16, 1974. Image credit: SETI Institute.

Frank Drake moved from Cornell in 1984 to become a professor of astronomy and Dean of the Division of Natural Sciences at the University of California, Santa Cruz. It was there he took up the position of President of the SETI Institute. When US Congress cut the funding for SETI in 1992, Drake worked tirelessly to help attract

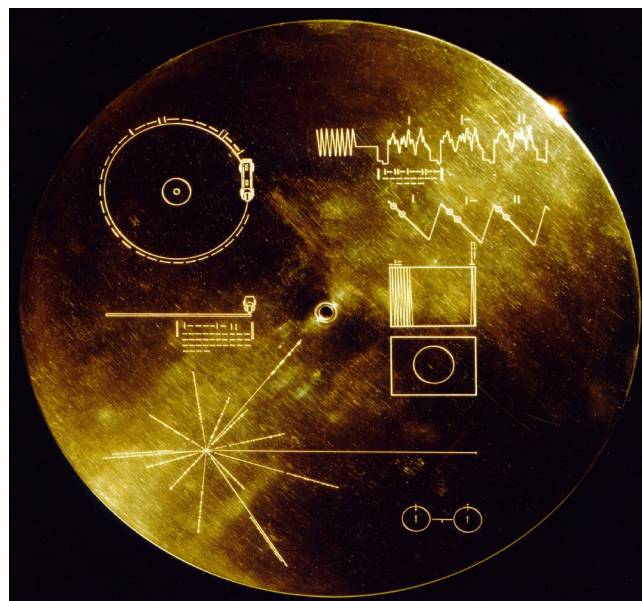


Figure 4. The Voyager “Golden Record” designed by a panel chaired by Carl Sagan that included Frank Drake. Image credit: NASA.

private funding that enabled work to continue. He retired from teaching duties in 1996, but continued working in astrophysics and on the Board of Trustees of the SETI Institute. He was on the advisory board as Chair Emeritus of the Breakthrough Listen project. Begun in 2016, Breakthrough Listen uses Green Bank and Parkes (in Australia) radio telescopes, together with laser detection at the University of California’s Lick Observatory, to search for signals from one million nearby stars and one hundred galaxies—by far the most comprehensive search for alien signals to date.

In his spare time, Frank Drake enjoyed lapidary work, the cultivation of orchids, and making red wine. By all accounts, he was a very modest, kind, and patient man, much loved by his family, and always ready to listen and to lend help when needed. He was also very courageous. With great modesty, Drake said that he was too dumb to understand the huge career risk in pioneering SETI when the subject was tacitly proscribed by the community.

This, of course, cannot have been true, and he would have been well aware of the dangers. He carried through with it regardless, because he knew that it was the right thing to do.

He leaves behind three sons, Steve, Richard, and Paul, from his first marriage; his second wife, Amahl, and their two daughters, Nadia and Leila, and four grandchildren. One of his granddaughters, Grace Drake, is a budding astrophysicist who graduated this year from the University of Edinburgh. During the summer of 2021, I had the privilege of working with her on a research project that I

think her grandfather would have approved of. We were looking at the energetic radiation environment of GJ9827, a K-dwarf at a distance of 97 lightyears with three known transiting planets that are prime targets for studying exoplanetary atmospheres.

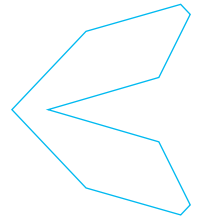
The legacy Frank Drake leaves behind is immense and continues to inspire generations of scientists. In his 1961 *Physics Today* article on Project Ozma, he wrote:

We are faced with a sound, highly important experiment that requires the use of very expensive equipment for a very long period of time. Those who feel that the goal justifies the great amount of effort required will continue to carry on this research, sustained by the possibility that sometime in the future, perhaps a hundred years from now, or perhaps next week, the search will be successful. (Drake, 1961b)

Frank Drake taught us the importance of that goal and made the search a reality.

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COMMENTARY

2022 Acknowledgements and Reflections

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This year brought a whirlwind of learnings, so my warmest thanks to the SSE leadership and *JSE* editorial team for actively supporting my adjustment to the Editor-in-Chief role. I want to especially acknowledge the production efforts of our stalwart Managing Editor Kathleen Erickson, as well as the selfless and continuing mentorship from the prior editor Stephen Braude. Extremely helpful discussions and guidance also came from colleagues, including Garret Moddel, Julia Mossbridge, Brian Laythe, Mark Rodeghier, Daniel Sheehan, and Michael Sudduth. Their periodic calibrations were much needed and greatly appreciated.

Of course, tremendous gratitude goes to the Associate Editors for doing the heavy “thinking and lifting” of evaluating submissions and facilitating quality reviews on a deadline. The time and energy associated with their work can neither be overstated nor overappreciated. This excellent group of scientific advisors likewise challenges me in many ways that enhance my perspective and hopefully my performance — so bravo to Imants Barušs, Jeremy Drake, Àlex Escolà-Gascón, Hartmut Grote, Rense Lange, Brian Laythe, James G. Matlock, Julia Mossbridge, Roger Nelson, Mark Rodeghier, Paul Smith, Harald Walach, and N. C. Wickramasinghe.

We are also lucky to have recently added two new editorial team members. First, please meet Rachael Ironside, Ph.D., from Robert Gordon University, Aberdeen, UK (<https://orcid.org/0000-0003-2513-0998>). Her research interests include social interaction, group experience, and the role of supernatural tourism and folklore in contemporary society. Dr. Ironside has experience in qualitative research methodologies, specializing in conversation analysis and the use of video to analyze social interaction. Next, we welcome back P. David Moncrief to the role of Book Review Editor (his previous stint was 2001 to 2014). There are some fresh elements coming to this section of the *Journal*, so stay tuned.

Finally, the editorial team extends its appreciation to the many experts who served as peer reviewers this year: James Arnette, Henry H. Bauer, William Bengston, Dick Bierman, Robert Bobrow, Mark Boccuzzi, Thomas E. Bullard, Mark J. Carlotto, Bernard Carr, Bruce Champagne, Jack Denur, Jeremy Drake, Brian Edwards, Àlex Escolà-Gascón, Sean Fitzgerald, Andrew Foss, Gary Goldstein, Dale Graff, Hartmut Grote, Bernard Haisch, Trevor Hamilton, Larry Hancock, Michele Hanks, George Hathaway, Richard Conn Henry, Louis Irwin, Deborah Lynne Katz, James Kennedy, Stan Koren, Stanley Krippner, John G. Kruth, Rense Lange, Brian Laythe, Phil Layton, James W. Lee, Cindy Little, Monika Mandoki, Everton Maraldi, James G. Matlock, James McClenon, Josh Mitteldorf, Garret Moddel, Margaret Moga, Julia Mossbridge, Ton Muller, Linda Murphy, Roger Nelson, Garry Nolan, Paul Nunez, Daqing Piao, Dean Radin, Adam J. Rock, Chris Roe, Chris Rutkowski, Malcolm Schofield, Daniel Sheehan, Lorraine Sheridan, Paul Smith, Kenneth Stevenson, Lance Storm, Massimo Teodorani, Diane Thompson, Chantal Toporow, Patrizio Tressol-

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di, Mark Urban-Lurain, Annalisa Ventola, Harald Walach, K. M. Wehrstein, Bryan J. Williams, George R. Williams, and Nancy Zingrone.

Some unpleasant editorial experiences also deserve comment. Namely, we received three general complaints about our recent content: (a) tolerating lengthy articles versus pushing for shorter papers, (b) allowing critiques of mainstream information about the origins or handling of the COVID-19 pandemic, and (c) showing a similar willingness to publish skeptical treatises of other hot-but-ton topics like climate change, i.e., anthropogenic global warming. Some detractors have characterized these latter issues as “editorial malfeasance” on Internet discussion groups and these misgivings even motivated a couple of readers to unsubscribe, and in one instance, to resign abruptly from the Editorial Board. My considered reply to these consequences is, “So be it, no regrets.” The editorial policy under my tenure is, unapologetically, to provide a platform for insights or information that confront “what science knows” and “how it knows it.”

There is at least some comfort in realizing that the former editor also had to deal with irritated authors and bouts of academic intolerance (e.g., Braude, 2010a, 2010b). On reflection, it could further be said that the *JSE* has been an equal-opportunity offender since its inception.

Those who object to certain content should engage in direct critique using counterarguments or evidence. This approach actually supports science rather than reinforces the fallacious social standard of ‘popular equals correct.’ Rigorous peer review, challenging the status quo, open debate, intellectual humility, and data-driven analysis and conclusions should not be troubling stances for any scientist (frontier or not) to take or defend. In fact, it would seem that these principles should define the shared moral compass and ethical tenets of all scholars. But the religion of ‘scientism’ with its ritual accusations of ‘denialism’ too often contaminates sociopolitical and educational institutions. To be clear, censoring serious

questions about data, its meanings, or potential implications is antithetical both to my stated agenda for the *Journal* and the scientific process more generally (for a discussion, see Houran, 2022). Individuals who thus believe in the dogma of “settled science” should certainly avoid the SSE’s membership, events, and publications—consider this as an advisory warning label. Nevertheless, we appreciate our readers’ good faith feedback and always strive to learn from constructive criticism.

Next year *JSE* will be every bit as provocative as it was in 2022, with two special issues underway: (a) *The Darker Side of Spirituality* (with Guest Editors: Malcolm Schofield, Carrie Childs, and Chris Howard) and (b) *The Shakespeare Authorship Question: Alternative Mappings* (with Guest Editor: Professor Don Rubin). Readers can also expect empirical and conceptual papers by noted researchers, some new faces, and even a few citizen scientists in the frontier realm. And there will not be a shortage of public debates and intellectual tensions on particularly controversial topics. All this and more happens only because of your SSE memberships, donations, and participation in SSE’s activities and periodicals. To be sure, one of the greatest joys of this holiday season is the opportunity for the *JSE* team to thank our wonderful readers and advocates and wish you the very best for the New Year — your ongoing interest and encouragement make all the difference.



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