

# EdgeScience

Number 47 | September 2021

Current Research and Insights

**Is There Truth Behind the Myth?**

**Seeing Without Eyes**

**A Search for Doubtful or Dismissed Wildlife**

**Lightning Imprints**

A publication of the  
**SOCIETY FOR  
SCIENTIFIC EXPLORATION**



## EdgeScience #47

September 2021

EdgeScience is a quarterly magazine.

Print copies are available from  
edgescience.magcloud.com.

For further information, see [edgescience.org](http://edgescience.org).

Email: [edgescience@scientificexploration.org](mailto:edgescience@scientificexploration.org)

**Why EdgeScience?** Because, contrary to public perception, scientific knowledge is still full of unknowns. What remains to be discovered—what we don't know—very likely dwarfs what we do know. And what we think we know may not be entirely correct or fully understood. Anomalies, which researchers tend to sweep under the rug, should be actively pursued as clues to potential breakthroughs and new directions in science.

PUBLISHER: The Society for Scientific Exploration

EDITOR: Patrick Huyghe

ASSOCIATE EDITOR: P.D. Moncrief Jr.

CONTRIBUTORS: Matt Bille, Timothy J. Burbery,

Andy Hilton, Chidambaram Ramesh

DESIGN: Smythtype Design

**The Society for Scientific Exploration (SSE)** is a professional organization of scientists and scholars who study unusual and unexplained phenomena. The primary goal of the Society is to provide a professional forum for presentations, criticism, and debate concerning topics which are for various reasons ignored or studied inadequately within mainstream science. A secondary goal is to promote improved understanding of those factors that unnecessarily limit the scope of scientific inquiry, such as sociological constraints, restrictive world views, hidden theoretical assumptions, and the temptation to convert prevailing theory into prevailing dogma. Topics under investigation cover a wide spectrum. At one end are apparent anomalies in well established disciplines. At the other, we find paradoxical phenomena that belong to no established discipline and therefore may offer the greatest potential for scientific advancement and the expansion of human knowledge. The SSE was founded in 1982 and has approximately 800 members in 45 countries worldwide. The Society also publishes the peer-reviewed *Journal of Scientific Exploration*, and holds annual meetings in the U.S. and biennial meetings in Europe. Associate and student memberships are available to the public. To join the Society, or for more information, visit the website at [scientificexploration.org](http://scientificexploration.org).

PRESIDENT: William Bengston, St. Joseph's College

VICE PRESIDENT: Garret Moddel, University of Colorado,  
Boulder

SECRETARY: Mark Urban-Lurain, Michigan State  
University

TREASURER: York Dobyms

EDUCATION OFFICER: Chantal Toporow

EUROPEAN COORDINATOR: Anders Rydberg

Copyright © 2021 Society for Scientific Exploration

The authors, artists, and photographers retain copyright to their work.  
ISSN 2330-4545 (Print)  
ISSN 2330-4553 (Online)

# CONTENTS

## FEATURE

### 3 Is There Truth Behind the Myth? The Field of Geomythology

By Timothy J. Burbery

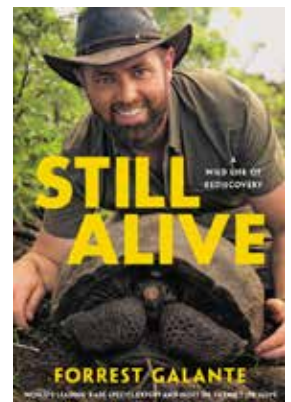


### Seeing Without Eyes 9

By Andy Hilton

### 16 REFERENCE POINT A Search for Doubtful or Dismissed Wildlife

A Book Review by Matt Bille  
of Forrest Galante's *Still Alive:  
A Wild Life of Rediscovery*



### BACKSCATTER 18 Lightning Imprints: A Natural Imaging Process by Chidambaram Ramesh



Timothy J. Burberry

# Is There Truth Behind the Myth? The Field of Geomythology



*The Fall of the Titans* painting by Cornelis van Haarlem.

*Gold-guarding griffins, Cyclopes, killer lakes, human-eating birds, and “fire devils” from the sky—such wonders have long been dismissed as fictional. Now, thanks to the richly interdisciplinary field of geomythology, researchers are taking a second look. In turns out that these and similar tales, which originated in pre-literate societies, contain surprisingly accurate, pre-scientific intuitions about startling or catastrophic earth-based phenomena such as volcanoes, earthquakes, tsunamis, and the discovery of bizarre animal bones.*

**T**hroughout history, there have been many famous battles and wars in which, for hours, days, months, even years, neither side was able to gain the upper hand. Among those are the Vietnam War, the Korean War, the Battle of Verdun (in World War I), the Battle of Waterloo, and the Siege of Leningrad (in World War II). Yet before these events, there was the Titanomachy. The mother of all stalemated conflicts, it featured the upstart Olympians against their forebears: the Titans. It dragged on for ten years, with no clear victor. Finally, Zeus, the All-Father, enlisted the help of the Cyclopes and the so-called “Hundred-handers” (Greek: *Gyges*), springing both groups

from Tartarus where they had been imprisoned by their father, Uranus. When the two armies readied for battle yet again, the Gyges were holding massive rocks in their many hands—and Zeus was packing Cyclopean lightning and thunder.

However, the Titans had not been idle during the hiatus. On the contrary: they had mustered into ranks and left their home base of Mt. Othrys to penetrate deep into Olympian territory. Their progress climaxed with a furious charge up Mt. Olympus. At this point, the clashing of the armies became so intense that the mountain itself was shaken. Desperate to repel the attackers, Zeus initiated a furious counter-charge, surging forward with his lightning and bolts. With this bold move, the Olympians finally gained the upper hand and soon routed the Titans. The vanquished gods were banished to Tartarus, with the exception of Atlas, who was sentenced to hold up the sky for eternity. Never again would they rise from this ignominious defeat.

This thrilling tale is one of the oldest in western culture. It has been recounted down through the centuries, beginning with Hesiod, whose epic poem *Theogony* (“The birth of the gods”), was written around 730–700 B.C., and, most recently, by young adult novelist Rick Riordan. His version of the war, *The Battle of the Labyrinth*, was published in 2008.

Of course, unlike Vietnam, Korea, Verdun, Waterloo, Leningrad, or any number of other real-world, protracted wars, the Titanomachy is the stuff of pure legend, without a trace of factuality.

Or is it?

The field of geomythology, which blends insights from geology and mythology, suggests that, in fact, there may be some truth to the tale. Geomythology sheds light on many other fables and stories as well and shows how they often contain striking pre-scientific intuitions. These include many iconic narratives such as Odysseus and the Cyclopes, Jason and the Golden Fleece, and the fall of Troy, as well as equally rich Aboriginal and Native American legends.

As for Zeus and the Titans, while it is true that they never existed, the conflict between them may have been inspired by a real-life, extremely violent natural event, that is, the eruption of the volcano Thera, which occurred in or around 1628 B.C. on the Greek archipelago of Santorini. The event was truly epic: the eruption probably reached a measure of 7 on the Volcanic Explosivity Index (VEI), the volcanic equivalent of the Richter Scale, which is used to categorize earthquakes. A 7 is classified as a “super-colossal” eruption; only a handful of explosions in history have been labelled as such. The largest officially recorded eruption in modern history, which occurred in 1815 when Mt. Tambora (Indonesia) blew its top, was also a 7 on the VEI. Thera released the energy of several hundred atom bombs in less than a second,<sup>1</sup> and its blast was of the Plinian variety. That is, it resembled the notorious eruption of Italy’s Mt. Vesuvius in A.D. 79, an event described by Pliny the Elder. The Thera explosion was marked by massive columns of debris and was so cataclysmic it sent hot gasses through the troposphere (the first layer of earth’s atmosphere) into the next one, the stratosphere, which extends from 9 to 31 miles high. It also wreaked havoc on the small Greek island, fragmenting

it into several smaller islands, and leaving a massive caldera, or cauldron-like depression, mostly submerged, where the island once stood.



NASA/GSFC/METI/ERSDAC/JAROS, and U.S./Japan ASTER Science Team

Santorini as seen from the Terra spacecraft. The eruption of Thera in 1628 B.C. created 30 cubic kilometers of magma which caused the volcano to collapse, producing a caldera. The largest island is Thera, and the smaller is Therasia. The Kameni Islands (dark in the image center) formed after the caldera.

A historian of geology, Mott Greene, argues that the main events in the Titan-Olympian war correspond closely to the phenomena of the Thera eruption. For instance, according to Hesiod, during the battle, the ground rumbled loudly, an effect that may correspond to the sounds often made by harmonic tremors, the small earthquakes that produce hums, or other sonic effects, just prior to an eruption. The impression of the shaking and groaning of the sky might have been inspired by the shock waves in the air created by this particular eruption, and Zeus’s charge could have been based on a combination of ignimbrites, which are rocks formed by ash cascading down a mountain,<sup>2</sup> and volcanic lightning.<sup>3</sup> Unlike non-volcanic lightning, which originates during thunderstorms, volcanic lightning is created by the “electrification of ash,” and “occurs in eruptive plumes,”<sup>4</sup> particularly the type that are common in Plinian eruptions.

As geologist Stephen Marshak notes, “[n]o two eruptions are exactly alike,”<sup>5</sup> and every active major volcano has what Greene calls an “eruptive signature”: a pattern of characteristics that enables scientists to distinguish this eruption from all others.<sup>6</sup> In the case of Thera, its principal elements parallel the Titanomachy very closely. In a sense, then, there was a



“Titanomachy” in ancient Greece long ago, if not between deities, then between contending natural elements.

A similar example, taken from a different mythology (Norse legend) is Ragnarök. The term, traditionally translated as “the twilight of the gods,” refers to a time in which the Norse deities—Thor, Odin, Loki, and others—are nearing their demise. This period culminates in a kind of Armageddon, in which the entire pantheon fights to the death in a civil war, the sun and moon are shrouded, and the world ends. Ragnarök is heralded by a time called Fimbulvetr (Old Norse for “terrible winter”), when extreme cold sets in and winter persists unbroken for three years.



Wilhelm Wägner/Wikimedia Commons

Ragnarök: Odin aims his spear towards the gaping mouth of the wolf Fenrir, Thor defends against the serpent Jörmungandr with a shield while wielding his hammer Mjöllnir, and an immense battle goes on around and atop the rainbow bridge Bifröst behind them.

Again, such scenarios might seem purely imaginary, and indeed well-known fantasy texts like *Game of Thrones* and the Narnian Chronicles feature periods of long, continuous winter. But once more, geomythology raises the possibility that the Norse legends and their modern successors preserve a modicum of truth. For as it happens, the seasons were, in fact, seemingly disrupted during the related extreme weather events of A.D. 535–36 and A.D. 539–40. Both episodes were probably caused by massive volcanic eruptions, which spewed tons of ash into the atmosphere, and blocked the sun for months, even years, plunging the Earth into volcanic winter. That trauma was recorded by contemporary historians, who noted widespread crop failure and unseasonably cold weather. The event is also indicated in tree-ring samples<sup>7</sup> and ice-core data.<sup>8</sup> In addition, it may have influenced the Norse tales, which circulated orally in pre-Christian Iceland (first settled in A.D. 874 by Norwegian explorers), and were then set down in writing in the 13th century.

Studying the ways legends and myths may contain nuggets of scientific truth is the prime activity of geomythology. The founder of this discipline, American geologist Dorothy Vitaliano (1916–2008), was a long-time faculty member at Indiana University. The idea of geomythology was sparked

for her in 1961, when she read an article by seismologist A.G. Galanopolous. He argued that the Thera blast might be linked to the fable of Atlantis. In response, Vitaliano invented the term *geomythology* in 1966.

## Defining Terms

To grasp the concept of geomythology, we should first note what it is not. Geologist Luigi Piccardi points out that the term has been used to mean “false ideas supposedly based on geological data.”<sup>9</sup> Presumably notions such as the flat earth and geocentrism would fit in this category. By contrast, Piccardi and other practitioners of geomythology define it in terms of scientific truth. Its prefix, “geo-,” is a variation on Gaia, or Gaea, the Greek earth goddess (*Tella*, in the Roman pantheon), and appears in other hybrid scientific terms such as geography (literally, earth writing); geomatics (the storage and transmission of geographic information); geology (the study of the earth); and geohydrology (the study of groundwater), among others.

When used in geomythology, “geo” primarily refers to geological phenomena, particularly large-scale events like earthquakes and eruptions. Yet it is worth noting that today geology, or geoscience, approaches the study of the planet as a network. In fact, this paradigm is known as the Earth System, and it includes not only the geosphere (the rocks) and the atmosphere, but also, in the words of a widely-used geology textbook, “the hydrosphere (surface and near-surface liquid water), the cryosphere (surface and near-surface ice and snow), [and] the biosphere (the great variety of living organisms).”<sup>10</sup> For this reason, geomythology can be applied not only to stories about well-known occurrences like eruptions, floods, and quakes, but also to events such as asteroids and comets, the formation of sinkholes, the digging up of strange animal bones, and many more.

The terms “myth” and “mythology” are harder to pin down. As Bruce Masse et al. note, “there is no universally accepted definition of the word [“myth”], nor is there a consensus view of its nature and how it should be studied.”<sup>11</sup> As for “mythology,” the *Oxford English Dictionary*, notes that the term can mean both “mythical stories, or traditional beliefs collectively” or “the study of myths.” Yet using the same word to explain both the thing itself as well as reflections on that thing is potentially confusing, a bit like using the term “sport” to denote both a game or contest as well as the running commentary on that game. A further complication is that “virtually all traditional knowledge keepers believe myths (and legends) to be historically true, whereas nearly all scientists presume they are *not*”<sup>12</sup> [my emphases].

There is a dizzying variety of theories on myth. For simplicity’s sake, we will consider four that have been influential in the 20th century. One is the psychoanalytic approach, derived from Sigmund Freud and Carl Jung, and popularized by Joseph Campbell. In it, myths function as subconscious projections that manifest archetypally within cultures. For instance, in his well-known book *The Hero with a Thousand Faces*, Campbell sees a connection between frogs and dragons,

the former being a smaller version of the latter. He then analyzes fables such as *The Princess and the Frog*, regarding them expressions of “that unconscious deep . . . wherein are hoarded all the rejected, unadmitted, unrecognized . . . elements of existence.”<sup>13</sup> Another is the sociological view of myth, set forth by Emile Durkheim in works such as *The Elementary Forms of Religious Life*. He contends that myths are invented by primitive societies “to establish genealogical relations between man and the totemic animal,”<sup>14</sup> that is, the animal (such as a bear) worshipped by a given society. Here, myth serves a ritualistic function in helping to bind societies together. In contrast to geomythology, although this approach does include animals, “Durkheim rejected the notion that myth arises out of extraordinary manifestations of nature.”<sup>15</sup>

**“Although geomythology’s main value might seem to lie in the sheer pleasure of the detective work of gleaning scientific data from old sources, the method has other uses as well.”**

In this sense, Durkheim’s views are similar to the study of structuralism, as seen in the work of the anthropologist Claude Lévi-Strauss. As its name indicates, it concentrates primarily on the *structure* of myths and legends rather than its subject-matter. If myth in this view has any truth to it, that truth has to do, not with content, but with the relations of the mythic structures to one another. As literary theorist Terry Eagleton notes, structuralists might compare two myths, one about the sun, and one about the moon, for example, and would claim that “the meaning of each image is wholly a matter of . . . the *relation* of one to the other. The images do not have a ‘substantial’ meaning, only a ‘relational’ one.”<sup>16</sup> Finally, we may note the historical or contextual approach. Its apparent link with history might seem to make it more congenial to geomythology. Yet, in fact, it does not consider the possible history that might have inspired a given myth, but rather the contexts, or “the impact of the social and historical environment *in which the myth is told*”<sup>17</sup> [my emphasis]. For example, folklorist Laurie Honko

deploys this theory when she considers whether a Finnish cosmogonic myth (one about the creation of the world) remains a myth when it is part of a ballad that is recited by young girls, as part of a ritual dance.<sup>18</sup>

These four approaches have been updated and fleshed out by more contemporary studies. Still, for all their variety, what is striking about these paradigms is that “none is seemingly willing to suggest that *a real observed natural process or event* may lie at the core of myth storylines”<sup>19</sup> [my emphasis]. By contrast, when she invented geomythology, Dorothy Vitaliano contended that some myths have served as relatively accurate, explanatory stories for natural events throughout history, particularly before the scientific method was established.

Although geomythology was new, it had ancient roots. In fact, in her 1968 article on the subject, Vitaliano harked back to antiquity, defining geomythology as “the geological application of euhemerism.”<sup>20</sup> To unpack this definition, we can begin by observing that the term “euhemerism” derives from Euhemerus, a Greek thinker who lived in the late 4th century B.C., and who served King Cassander of Macedonia (in north-east Greece) as a mythographer, that is, as one who compiles and writes mythic stories and tales. Euhemerus was also a traveler, and one day while visiting the island of Panchaea (probably modern-day Socotra Island, Yemen), he claims to have made a shocking discovery: on a golden stele (a monument) was posted a list of birth and death dates of various gods.

The discovery appears to have destroyed his religious faith. As a result of this experience, Euhemerus founded a rationalistic approach to myth, indeed, we might say, a demythologizing one, which sought to uncover the roots of natural events behind claims that the gods were supernatural. This approach has a long history. Since Euhemerus’s time, it has been used both to bolster and debunk Christianity. In addition, it was applied by the Icelandic mythographer Snorri Sturluson (1179–1241) to explain the natural origins of figures such as Odin. The archaeologist Heinrich Schliemann (1822–90) also applied the method in his excavation of Troy. Philosopher Herbert Spencer (1820–1903) and poet Robert Graves (1895–1985) were influenced by this approach as well.

In formulating geomythology, Vitaliano turned to euhemerism, applying it geologically as a way to uncover real natural history behind some myths. In doing so, she differentiated between two types of geomyths: one is etiological legends, invented well after the fact “to explain the end results of processes which were not witnessed.”<sup>21</sup> These include narratives of North American folklore such as the exploits of Paul Bunyan and his blue ox, Babe. For instance, the lumberjack and Babe allegedly created both the Grand Canyon, when Bunyan dragged his ox behind him, as well as Minnesota’s 10,000 lakes, by leaving behind their colossal footprints, which gradually filled in with water. In fact, the Grand Canyon was formed millions of years ago, long before any humans were alive. The 10,000 lakes are more recent—they were created by melting glaciers during the Pleistocene era—but still much earlier than any lumberjacks were in the area. (The earliest reference to Bunyan appeared in 1904, in the *Duluth News Tribune*.)

The charm of these and other etiological stories is undeniable, but our primary concern here is Vitaliano's second type, the euhemeristic fables. As she remarks, these tales "seek to explain certain specific myths and legends in terms of *actual geologic events that may have been witnessed* by various groups of people"<sup>22</sup> In other words, while modern people may regard mythology as essentially a millennia-long game of Telephone, with crucial information being lost or distorted in transmission, in fact a number of these stories preserve traces of real information obtained first-hand. Many have to do with occurrences that would have been memorable, even traumatic, for those who experienced them. As noted, they include natural disasters and the uncovering of weird animal remains.

Although geomythology's main value might seem to lie in the sheer pleasure of the detective work of gleaning scientific data from old sources, the method has other uses as well. One is that geomythology has what might be called an implicit "social justice" element. As historian and folklorist Adrienne Mayor demonstrates, one important chapter in the history of the discipline is the numerous discoveries and creative misunderstandings of large, fossilized animal bones in many areas of the world. For instance, the ancient Greeks appear to have routinely encountered animal bones weathering out from storms or quakes, or when they were plowing their fields. These remains, such as those belonging to woolly mammoths, were creatively misread as the skeletons of giant heroes such as Ajax, Orestes, and Achilles.

Yet these misconstruals were, at times, not far off the mark, based as they were on careful, if fanciful, observations of the skeletons. By contrast, such bones were overlooked by Aristotle and other philosophers of the time; the bones appear to have been too anomalous for such "establishment" thinkers to take seriously. Aristotle, for instance, tended to label them as outliers, "monstrous" exposures that had no place in his method of seeking of normal, regular specimens.<sup>23</sup> As a result, it was often the common people, reflecting on their discoveries, who took these important first steps toward what eventually became the discipline of paleontology.

In a similar manner, geomythology has brought recognition to marginalized groups such as First Nation tribes, Aboriginals, and African slaves by showing that their narratives and observations of nature, which were often dismissed by western scientists, in fact anticipated genuine discoveries and theorizing in science. Notions of infinite time, for instance, were set forth in western thought in figures such as the farmer-turned-geologist James Hutton (1726–97), yet the Native American tribe known as the Pit River nation, or Achumawi, had an ancient creation story that suggested that the universe is 10 billion years old.<sup>24</sup> This is an impressive conjecture, relatively close to the figure of 13.7 billion years old now held by physicists. In addition, Aboriginals may have observed first-hand a rise in sea level some 7,000 years ago, and recorded the observation in their myths. Furthermore, a recent paper raises an even more astonishing possibility that Aboriginals witnessed and memorialized the formation of a volcano, a staggering 35,000 years ago.<sup>25</sup>

Because of such narratives, some scientists are now turning to geomyths to supplement their research, particularly when

the legends deal with events from the past that pre-date written records. Geomythology adopts, as it were, a binocular vision, with one eye firmly on scientific procedure (careful observation, replication of experiments, peer review), and another on stories from outside the scientific mainstream. It does so by proceeding cautiously, making sure to separate the wheat from the chaff, the Wegeners from the Velikovskys. Both men were mocked for their theories, but Alfred Wegener's notion of continental drift, first published in 1912, eventually became a mainstream geological view. By contrast, in his book *Worlds in Collision* (1950), Immanuel Velikovsky argued that in or around the 15th century B.C., Venus (the planet) was ejected by Jupiter, and made a near-miss of Earth while causing all sorts of catastrophes on our planet. This theory has been vigorously rejected by virtually all scientists.



Bronze statuette of a griffin, decorated with gold. Roman era 50–270 AD.

Rijksmuseum van Oudheden, Leiden/Wikipedia]



*Protoceratops andrewsi*.

Credit: Carnegie Museum of Natural History/Wikipedia]



## Is Geomythology a Science?

The Scientific Revolution, generally dated as beginning in 1543 with the publication (on his deathbed) of Copernicus's *De Revolutionibus Orbium Coelestium*, inaugurated a period in which thinkers such as Francis Bacon, Galileo, Kepler, Copernicus and others initiated an empirical, systematic study of nature. Yet it is also true that prior to 1543, oral cultures also carefully observed nature and made informed guesses about its workings.

For example, the griffin, a legendary hybrid creature with an eagle's head and a lion's body, has engaged writers from Aeschylus to J. K. Rowling. The animal is reputed to be a fierce guardian of gold treasure and is clearly fanciful. Yet historian/folklorist Adrienne Mayor makes a strong case that in antiquity, artistic and literary depictions of the griffin may have been influenced by real-life encounters between travelers in central Asia and the skeletons of the dinosaur *Protoceratops* found in the Gobi Desert. She also shows how the griffin, with its quadruped morphology, quickness, and warm-bloodedness, presages the Dinosaur Renaissance, which began in the late 1960s and sought to leave behind outdated views of dinosaurs as sluggish and cold-blooded.<sup>26</sup>

Is it possible, then, to regard geomythology as a science, having the same status as other hybrids such as geochemistry or geohydrology? At this point, the answer is no. For one thing, the old stories are often murky, anonymous, and extant in varying, sometimes contradictory, versions. For another, it is an unresolved, and probably unresolvable, chicken-or-egg question as to whether myths were inspired by the discovery and misidentification of physical evidence, or whether the stories came first and were then "confirmed" by the evidence, creatively misconstrued. Indeed, it is entirely possible that some geomyths are purely fanciful, the result of imagination, nothing more. That being said, there are also contraindications, particularly when we focus on geomyths that appear to be closely linked to physical remnants and/or eyewitness accounts.

In sum, while geomythology is not regarded as a science, it has proven to be an invaluable ally to researchers over the centuries and has helped to confirm a number of scientific discoveries.

*Excerpt adapted from Geomythology: How Common Stories Reflect Earth Events by Timothy J. Burbery, published by Routledge, 2021. Reproduced with permission of the Licensor through PLSclear. © 2021 Timothy J. Burbery.*

**TIMOTHY J. BURBERY** received his Ph.D. in English Renaissance Literature from Stony Brook University in 1997. He is currently Professor of English at Marshall University, where he teaches, among other subjects, Shakespeare, scientific and technical writing, science fiction, and ecocriticism/literary theory.



## ENDNOTES

1. "The 11 Biggest Volcanic Eruptions in History." *LiveScience*. 23 Feb. 2016. paragraph 25.
2. Marshak, Stephen. *Earth: Portrait of a Planet*. New York, London: W.W. Norton, 2015, p.292.
3. Greene, Mott. *Natural Knowledge in Preclassical Antiquity*. Baltimore, London: Johns Hopkins University Press, 1992, p. 62.
4. Cimaerelli, C., M. A. Alatorre-Ibargüengoitia, K. Aizawa, A. Yokoo, A. Díaz-Marina, M. Iguchi, D. B. Dingwell. "Multiparametric observation of volcanic lightning: Sakurajima Volcano, Japan." *Geophysical Research Letters* 43.9. 23 February 2016. p. 4221.
5. Marshak, *ibid.*, p. 289.
6. Marshak, *ibid.*, p. 56.
7. Baillie, M.G.L. "Dendrochronology Raises Questions About the Nature of the 536 AD Dust-Veil Event." *The Holocene* 4.2 (1994): 212–17.
8. Larsen, L.B. et al. "New ice core evidence for a volcanic cause of the A.D. 536 dust veil." *Geophysical Research Letters* 35 (2008): 1–5.
9. Piccardi, Luigi and W.W. Masse, eds. *Myth and Geology*. London: Geological Society Special Publication, 2007, p. vii.
10. Marshak, *ibid.*, p. 43.
11. Masse, W. Bruce, et al. "Exploring the nature of myth and its role in science." In Piccardi, Luigi, and W.B. Masse, eds. *Myth and Geology*. Geological Society: Special Publication 273. London, 2007, p. 9.
12. Masse, *ibid.*, p. 10.
13. Campbell, Joseph. *The Hero with a Thousand Faces*. Princeton: Princeton University Press, 1968, p. 44.
14. Durkheim, Emile. *The Elementary Forms of Religious Life*. Oxford: Oxford University Press, 2008, p. 105.
15. Masse, *ibid.*, 13.
16. Eagleton, Terry. *Literary Theory: An Introduction*. Minneapolis: University of Minnesota Press, 1983, p. 94.
17. Eagleton, *ibid.*, p. 13.
18. Eagleton, *ibid.*, p. 52.
19. Eagleton, *ibid.*, p. 13.
20. Vitaliano, Dorothy. "Geomythology: The Impact of Geologic Events on History and Legend with Special Reference to Atlantis." *Journal of the Folklore Institute* 5:1 (1968), p. 1.
21. Vitaliano, *ibid.*, p. 10.
22. Vitaliano, *ibid.*, p. 1.
23. Mayor, Adrienne. *Fossil Legends of the First Americans*. Princeton University Press, 2005, p. 217.
24. Mayor, *ibid.*, p. 150.
25. Barras, Colin. "Is an Aboriginal tale of an ancient volcano the oldest story ever told?" *Science/NAAS* 11 February 2020.
26. Mayor, *ibid.*, pp.15–53.



Andy Hilton

# Seeing Without Eyes

In 1988, while dancing at a neo-shamanic workshop, I went into trance. I saw Leo, the course leader, go behind me to give protection with the herbal smudge sticks, and then I was catapulted into the cosmic beyond. What happened next—when I “saw” and knew, or *gnew* (gained gnosis)—was the peak experience of what I came to conceive as a “spiritual initiation.” But that’s another story. The point here is my first *seeing*, of Leo with the smudge-stick. Just a detail in the context, but one that always gave me pause. For my eyes were closed, and he was behind me.

Paramahansa Yogananda described something similar, albeit much extended and expanded and with his eyes open, commencing his (first) experience of “cosmic consciousness”:

The whole vicinity lay bare before me. My ordinary frontal vision was now changed to a vast spherical sight, simultaneously all-perceptive. Through the back of my head I saw men strolling far down Rai Ghat Road, and noticed also a white cow who was leisurely approaching. When she reached the space in front of the open ashram gate, I observed her with my two physical eyes. As she passed by, behind the brick wall, I saw her clearly still...<sup>1</sup>

Relatedly, those who report Near Death Experiences (NDEs) and Out of Body Experiences (OBEs) sometimes describe 360-degree vision, and these routinely involve not just seeing through walls but *moving* through them—well, ceilings mainly. In fact, as psychologists Kenneth Ring and Sharon Cooper noted, some of the reported veridical seeing in these experiences has come from those who don’t normally see at all:

... both NDErs and OBErs offered abundant testimony that reports of visual perception among the blind are common, that their impressions concern both things of this world and otherworldly domains, and that they are often clear and detailed, even in narratives furnished by those who have been blind from birth.<sup>2</sup>

What’s going on here? There is a seeing without eyes—perhaps 360 degrees or “through” things or by the blind—but regardless, of the everyday environment in the here-and-now. Although the circumstances are subjectively exotic, the visual perception is of the ordinary. And the situation need not be exceptional. Indeed, this type of eyeless seeing that is *veridical* and *immediate* is something that, basically, we can all learn and develop as a skill. The rider of “basically” is added here since it can be difficult to learn (for adults), and it has not been shown for everyone (e.g., research on aphantasia—the inability to voluntarily create mental pictures—is needed). Generally,



Intovision.

Developing the ability in class: expanding the field of vision to 360°.

however, the ability just needs to be stimulated and fostered, ideally early in life.

Most people who learn this sort of seeing start by attending to things placed in front of them, like colored cards, printed symbols, or their own hands. While faraway or otherworldly things may be observed (and seeing behind *is* sometimes used in early development), this is not the methodological orientation—which is what sets this seeing-without-eyes apart from its more well-known siblings, clairvoyance and remote viewing (RV). At the same time, disregarding differences in expectation (intended object) and technique (and societal setting, worldview, etc.), one may reasonably posit the same primary mechanism for all these “para-seesings” or ESP sight modalities, which tend anyway to blur into one another (e.g., remote viewers may be tasked with invisible and “esoteric” targets and regard their protocols as tools for clairvoyance; clairvoyants may be pre-disposed to communications with the departed, but they also see real-world events in the spatiotemporal proximity). Eyeless looking at the ordinary in real-time may similarly extend to the immaterial and the distant—as mentioned—but that is not its starting point or primary aim. Hence, the neologism *Veridical Immediate Seeing* (VIS).

Because VIS-seeing is like normal seeing, it provides a reliable, replicable demonstration of psi (ESP) that works well for laboratory testing. That makes it quite exciting as a bridge-head in the (still) ongoing struggle with “skeptics” and simple materialism. Practically, VIS has numerous applications, some well-developed, most not, others barely imagined. Most obviously, it carries the potential of an end to visual impairment. Developing their faculty for VIS, the blind learn to see.

## Preliminary Considerations

It is already known that the reception of photons is not a sufficient condition for sight. The biology and chemistry and physics of sight can be described in mechanistic terms as a process like that of a camera. Approximately, photoreceptors (rods and cones in one case, chemical reactions or digital electronic signals in the other) use energy (from oxidized food or electric batteries) to power the conversion of light waves into images (in the retinas or celluloid/pixels), which may be again converted and then moved (via neural pathways or chemical processing/circuit boards), perhaps for storage and retrieval (as neuronal collections and synaptic connections, or as photographs, files, etc.). But cameras do not see!

Really, it is the other way around, it is cameras that operate like eyes—and optic nerves and occipital cortex, even. Yet still without vision. For sight, the *act of seeing* involves *consciousness*, or attention. The experience that separates us from a camera is revealed by autistic savants (who *can* recall everything “scanned” in their visual field), demonstrated by experiment (famously, where participants counting basketball throws fail to see a “bear” wandering across the court), and regularly repeated in daily life (when we notice something that previously we hadn’t). So the electrochemical conversion of light in the retina is not in itself sufficient for sight—but nor is it necessary.

The term “VIS” is introduced here because it captures a meaning, and no other single, standard name for the ability has yet emerged. In fact, this seeing has several names, such as “direct” and “extra-ocular vision.” Another name is “seeing blindfolded” because that’s how people learn. The blindfold can be a special mask or just a scarf to cover the eyes and block the light, although actually the eyes do not have to be covered or even closed. Skilled VISers can switch between seeing modes (VIS with eyes open)—although again, there is mitigation since non-practitioners may also find themselves doing it (c.f. Yogananda, above). Indeed, that may be what is happening when people see things like auras and ghosts.

Considering this “eyeless vision,” Ring and Cooper commented on the phenomenon of “blindsight,” as when a blind person perceives objects by a type of *intuition*, so not really seeing. But these modes of access also may be treated as points along a continuum, without necessarily discrete demarcation. Analytically, from a transcendental “gnowing,” the individual (subject) distinguishes things (object); then the perceptual mode clarifies and reifies (“constructs” reality). This takes us from the unified and inchoate to the separate and distinct, through intuition to the senses, such as vision. Or, seeing is knowing is gnowing—in mystical vision—and gnowing is



Layla making cupcakes, following the instructions on the packet.

Leonie Appetit



Claudia learning online. She has the genetic condition *retinitis pigmentosa* and is now legally blind. The goal is be able to read and see the room before she finally loses her eyesight.

Rob Freeman

knowing is seeing (in everyday life). Or, all seeing requires Mind.

This broadly follows a line of thought introduced both by mystics and thinkers who have taken clairvoyance and ESP seriously (i.e., as facts in the world to be explained). Their metaphysics reverses the fundamentally receptive approach, based on reflection and a physicalist conception of light, for an active approach based on radiance and a numinous light (itself experienced as “enlightenment” or “seeing the light”). Psychically, one may say, the “divine light” is refracted in the collective and personal mind (as cultural/individual image-making) and then restricted again through attention for the presentations of ordinary sense/sight. VIS spans the latter two categories of this alternative explanation of seeing. Similarly, in the words of philosopher Curt John Ducasse, “sensation [normal seeing] can be viewed as a special instance of clairvoyance,” and of Captain Malcolm Moncrief, “clairvoyance is channeled to the visual organs [eyes].”<sup>3</sup>

This is quite like the experience of psychic Carol Ann Liaros in the mid-1970s, whose work started from teaching classes on intuition (or “instant knowing”), including seeing auras, and moved toward VIS and also “mind travelling” (remote viewing). Liaros discovered that blind people could see the images on black-and-white photos (and could see the photos when they were turned over, face-down, and even their real-life colors).<sup>4</sup> Later, problematizing this “sight” of the blind, Ring and Cooper were similarly to infer a “transcendental



awareness,” which “can be omnidirectional” and involves a “seeming omniscience.” Among the profound philosophical implications this carries, which cannot be considered here, also implied is the potential of VIS for the induction (as opposed to just prefacing) of mystical experience. There is anecdotal evidence for this.

### Modern Origins

A full history of this “third-eye” ability might take VIS (like other “superpowers”) to be natural to humans (and other animals). The modern period, however, can be dated from a book by Louis Henri Farigoule, writing in 1924 as “Jules Romains.” *Vision Extra-Retiniennne* was translated as *Eyeless Sight* for publication in London and New York as well as Paris.<sup>5</sup> An enthusiastic review in the leading UK publication for nurses took a practical approach. It noted, for example, the difficulty in ascertaining whether the nostrils “play any part in the vision of shapes” and appreciated the “necessity of training.”<sup>6</sup> The medical journal *The Lancet* was also impressed, although critical on two points. One was that Romains’ “paroptic vision” experiments took “no account of telepathy”—though this only required fuller exclusion. The other was that while the mechanism could indeed involve “receptors scattered over the surface,” as Romains suggested, he had not actually located his supposed ocelli (simple eyes) in the epidermis.<sup>7</sup>

Skin-seeing, named “dermo-optical vision” or “dermo-optical perception” (DOV, DOP), has long been reported in journals; a thermal effect (skin hyper-sensitivity) is supposed to account for the phenomenon in a non-radical way.<sup>8</sup> For his part, Romains ranked the relative sensitivities of several parts of the body. This is probably all going down the wrong path, however, since what is really going on is a form of VIS that has rather little to do with the skin—which is the working hypothesis of a small, interdisciplinary group in Serbia currently investigating a tripartite categorization of VIS based on different individual orientations to different VIS styles (of which DOV is one). Less standard but still fundamentally materialist was the *bioenergy* approach taken in Soviet studies from the 1960s—the American response to which, incidentally, was instrumental in the development of what became remote viewing. Indeed, a whole chapter of 117 references was dedicated to “dermo-optic sensitivity” in the CIA-sponsored bibliographical compilation on parapsychology (psychoenergetics).<sup>9</sup> Studies made in China during the 1980s also focused on DOV.<sup>10</sup>

For people (seers) to study, Romains had used subjects at random and instructed them to read from a newspaper. Over the years, many individuals have spontaneously discovered or self-developed their natural ability and given performances for audiences and researchers. One such was Kashmiri-Pakistani Khudah Bukhash, who moved to the US in the 1930s. Later, billed as “Kuda Bux, the X-Ray Man,” he was given a CBS show as the “Hindu mystic.” Another was William Foss, whose aim was to set up a clinic for the blind. An FBI investigation in 1957 reported that he had “inadvertently discovered a method of teaching others to see through barriers,” such as to “read documents which have been enclosed in a briefcase.”

A pertinent interest for the Bureau, no doubt. Another, Rosa Kuleshova, was a much-tested Russian who discovered her ability in 1962 when learning braille.<sup>11</sup> She was featured in a full-length *Life* magazine article on “Dermal Vision.”<sup>12</sup>

Among other things, the *Life* article referred to synesthetic experience and earlier work by Russian psychologists Alexei Leontyev, who headed a panel to investigate DOP, and Abram Novomeysky, who would author some three dozen papers on the subject by the 1980s. Novomeysky found that people could see without touching and even through sheets of metal, including copper.<sup>13</sup> While the former goes beyond DOP, the latter mitigates against an electrical phenomenon, a view supported by the Faraday cage remote viewing of psychics Uri Geller and Ingo Swann, reported, for example, by physicist Harold Puthoff.<sup>14</sup> Indeed—and again—the *Life* piece concluded that “theories abound but none satisfies.”

### A Growing Phenomenon

Lloyd Hopkins came across the ability in the early 1970s, later developed a teaching method, and in the 1980s established the Mind Sight & Perception Research Center, through which he published a book on the subject.<sup>15</sup> It was the term “mindsight” that Ring was later to prefer—though that word may perhaps be better used collectively, as a name for all the psi seeing modalities (VIS, RV, clairvoyance, OBE/NDE). In 1982, in Mexico, youngsters who had been taught VIS were featured in a television presentation; following up a few years later, psycho-physiologist Jacobo Grinberg-Zylberbaum, who had contributed to the TV show, designed his own teaching program for children. “In less than an hour,” he wrote, “six or seven kids saw extra-ocularly.” Some of the children developed “omnidirectional perception” and learnt to see in the dark (infra-red VIS has since been separately demonstrated). They could even perceive “organs inside the human body” (internal body-scanning, e.g., for diagnosis) and “destroy pathogens by emitting . . . energy from their fingers.” This work was curtailed when the children further developed these kinetic and then telepathic powers:

[W]e continued . . . for several months until both the director of the school and the parents forbade us to continue because the children were guessing their thoughts, moved objects at a distance, and began to challenge their entire worldview.<sup>16</sup>

Grinberg-Zylberbaum’s research interests more generally led him through shamanism to the development of an idealist metaphysics outlining an approach to what we might dub a *really* Grand Unified Theory (rGUT): the introduction of consciousness as a variable in physics theory.<sup>17</sup> Meanwhile, the Mexican development of VIS was grounded in the work of Noé Esperón, schools were established and teachers were trained. Perhaps it was the Spanish-language connection that facilitated a dispersal of activities to South America—at any rate, it was while watching a TV broadcast from Paraguay that Spanish-speaker Katharina Friedrich, a Bulgarian economist working as a statistician in (then) West Germany, came across VIS.

Motivated by her own severe visual impairment, Friedrich discovered through the internet that children in China and Thailand had also learned VIS.<sup>18</sup> Beyond the lessons of her own personal journey—for example, that VIS practice improves normal sight to the extent that glasses become unnecessary—Friedrich’s work has theorized a role for two nerve pathways extending from the (optic and auditory) thalamus toward the center of the forehead (frontal lobe). These may be interior “antennae” making the “third eye” (and ear), or *ajna chakra*—a part of the neurological hardware operative in VIS (and other mind-seeings, and hearings, presumably). With the thalamus, of course, a role for the limbic system more generally is indicated, including the pineal gland, popularly considered the “psychic center,” and the caudate nucleus, as recently indicated in MRI-based research on intuition by microbiologist Gary Nolan supported by physician Kit Green<sup>19</sup>—and previously reported psychically by neuro-psychiatrist Shafica Karagulla from her work in 1961 with Viola P. Neal, who experienced “night classes” in her sleep.

Karagulla described several individuals with “higher sensory perception,” including types of mind-sight, such as seeing into people’s bodies (like Grinberg-Zylberbaum’s children), both physically and “energetically,” along with ESP-type intuition (or clairvoyance). These, she noted, were being employed routinely but quietly or covertly in professional contexts (by business leaders, doctors, etc.).<sup>20</sup> Karagulla’s friend Viola Neal, who had introduced her to this topic, was also capable of “mind reading” or seeing another’s perceptions (like seeing through someone else’s eyes, which has also been more recently reported in VIS). On the mechanism, Karagulla and Neal reported this “lesson”:

The *extra-pyramidal system* will be developed more in the brain of future mankind. The *caudate nucleus* deals with the head antennae—millions of antennae which in the future will deal with the ability of all the extrasensory perception abilities, such as the ability to see events at a distance and the ability for telepathic contact.<sup>21</sup>

Another individual who came across someone who could VIS was a chemical engineer named Mark Komissarov. Originally from Moscow but now in New York, Komissarov



Children at the “First International Olympics Contest for Young Wizards,” held in Kuban Land (Black Sea, Russia).

then learned how to VIS himself and developed a teaching methodology (he taught Friedrich). He set up “InfoVision” (which also named the ability) and postulated the “Center of Direct Information Perception” (as a neuro-functional entity). As these two names imply, the assumed mechanism here was characterized by an immediate access to *information* rather than any energy passage of waves or particles, like the “vibrations” of the Indonesian martial art enabling VIS of Merpatih Puthior, or lepton emission, as suggested by Vyacheslav Bronnikov. Bronnikov is another who has developed a teaching method, established an enterprise (with a center in Rotterdam), and published on the theory and practice of “neurovision.” In EEG-testing of Bronnikov students, brain activity was reported as spatially and rhythmically reorganized when VISing, with beta-wave activity changes being the most pronounced.<sup>22</sup>

### Thinking VIS: The Information Approach to Psi

Expanding from seeing to intuition more broadly, per Ring and Cooper and Grinberg-Zylberbaum, a concept of perception as the biological transformation of information was employed by ex-NASA physicist Tom Campbell in his virtual reality approach to rGUT, his “Big TOE” (Theory Of Everything), which he (also) now takes to be corroborated by VIS.<sup>23</sup> The idea of “information” employs a modern machine metaphor, primarily the computer. Bridging divides, it is utilized to talk scientifically about the otherwise mystical (like the Akashic Records). Referring to brain parts as neurological “hardware” (above) uses the same analogy, of course—which goes both ways since computers have “memories.” Indeed, this metaphor may be understood as expressing, at the lexical-conceptual level, an organic-AI interface (and thence the singularity of anthropomorphized robot-cum-dystopian cyborg as a direction of travel).

The word “information” is also commonly used interchangeably with “data,” which can scientize the subjective but also connect methodologies. Thus, in remote viewing, differently gained types of information can provide data points for triangulation that is actionable (i.e. gives a working hypothesis for application in areas such as police and archeological detective work). The significance of the words we use as markers for how we think these things is not unimportant as we shift paradigms from the materialist through the postmaterialist to a new *transmaterialism*.

Post- and transmaterialism (will) incorporate non-classical “matter” (fields), with quantum properties (uncertainty, non-locality, entanglement, with coherence, resonance, etc.), but anyway beyond EMF. This is the type of move involved in introducing information as explanatory for VIS (as a fundamental, or conceptualization). It also mirrors the experience in healing of Bill Bengston, the sociologist-turned-healer, who similarly started by meeting a naturally gifted individual and then pioneering a practice before later concluding that the mechanism at work did not involve the transfer of any energy. Which is precisely also what seems to be demonstrated by renowned “instant” or “miracle” healers from Jesus of Nazareth to Bruno Gröning in post-War Germany.



## Contemporary Developments and Looking Forward

Mark Komissarov's InfoVision, having now teamed up with Mihaela Istrati from Romania, has further extended our understanding of VIS and its applications. For example, the informational approach implies that we may literally read binary digits (virtual bits), or at least see their representations. This is precisely what was reported with a woman who saw what was encoded (at that time) in a floppy disc. Using VIS, that is, she saw the files saved on the disc, "opened" one, and read it. In laboratory research, VIS was confirmed with pupil dilation readings and sensors in the mask showing that no light was entering while figures produced by a random number generator were read out and 100% scoring secured—neurologically, meanwhile, an EEG test gave interesting results, including high alpha-wave readings (Puthoff had found alpha-blocking with remote viewing).<sup>24</sup> Further investigation could also include MRI examination for hemispherical activity, since right brain aptitudes are indicated, while another, psychological line of research could consider the effects on performance of other people's expectations (e.g., with twins).<sup>25</sup>

Applications developed by InfoVision have included teaching online, as seen in Caroline Cory's 2020 film *Superhuman: The Invisible Made Visible*. Also, they have extended observed VIS effects like raised IQ and EQ, with therapeutic breakthroughs for people diagnosed with severe disorders (including ADHD and ASD). The highly promising early results again suggest rich avenues of research and integrated practice (liaising with clinical psychologists, art therapists, etc.).<sup>26</sup> In terms of healing, another suggestive connection is with psychotropics, like LSD, psilocybin, and ibogaine, for mental health and psychiatric therapies. The hypothesis here would be first, that opening the third eye or activating the psychic function stimulates a transcendent transformation, and then, that the learning and practice of VIS is an accessible and advantageous way to achieve this.

Indeed, the human potential of this seeing for therapeutic intervention, wellness, and species upgrading appears immense. Another gain claimed is accelerated learning. Across India, for example, there are now schools for "midbrain activation" using VIS—often in tandem with *quantum speed reading* (QSR), as developed by Yumiko Tobitani in Japan. For some, the aim here is transactional (academic success, monetary gain, etc.), while for others, it is a more spiritual affair related to life purpose. One VIS skill that Merpatih Puthi has emphasized in Indonesia is that of "locating" (e.g., bodies in landslides), although their application is like dousing (i.e., through intuiting more than seeing).<sup>27</sup>

In a 2020 article in the *Journal of Scientific Exploration*, Dong Shen referenced the earlier VIS (DOV) research in China for his case-study report of combined psi modalities (ESP and PK). In this experiment (repeated by a colleague with multiple participants), a small, folded piece of paper in a cup was "moved" by the subject, who then correctly "read" the number written on it (actually, no-one saw the paper move, it was just found to be gone from the cup and then spotted on the floor). This prompted Shen's designation of a "second conscious state," attained in this case to see an object to then



Rob Freeman

Wendy Gallant sees through the mask and a black curtain (introduced for skeptics who are suspicious of the mask).



Rob Freeman

Wendy practicing at home.

move it.<sup>28</sup> Picking up on this psi-combination, or fusion, Sean McNamara, who writes and guides in the field of "consciousness exploration" and psi skills development, has suggested "extending seeing without eyes to teleportation and telekinesis [using foil]."<sup>29</sup> There is another suggestive parallel here, again supporting the informational approach: that of the physical moving/repositioning of the paper/foil with the virtual opening of the floppy disc file.

Sean McNamara posted his idea on a Facebook group, "Learning to See Blindfolded," created by Rob Freeman (a documentary filmmaker) and Wendy Gallant. Group members are encouraged to partner up and co-learn. Further to the self-help, group-share structure of the online community—and in addition to the many practitioners operating and dedicated centers opening up and dotted across the globe—the wider and deeper promise of scaling up for mass application at the societal level will more likely be systemized through regular schools, especially kindergartens (a process already begun by InfoVision). The development, implementation, and integration of dynamic VIS programs with fun activities should be an essential component of future education systems. Although not limited by puberty—the elderly can learn too, and twenty-year-olds can learn quickly—it is certainly children who learn quickest. In fact, youngsters do not so much learn as copy. A three- or four-year-old can just watch and do, much as with any other activity.

Finally, there are the effects of VIS-looking into another's eyes. This can induce a sense of collapsed space and dilated time with numinosity—or a mystical experience. I first came

upon this when watching a “transported” drummer from Ghana; locking eyes, we were suddenly fixed together, as if at the ends of a concertinaed tunnel, as the world outside disappeared. Then, where ESP accesses or merges into PK, revolutionary possibilities for healing and wholing emerge. For example, one can imagine a world in which mothers who have themselves been VIS-ing since infancy consciously share-the-stare with their newborn. Indeed, the implication is of a naturally new human for the still new millennium.

At this crucial juncture for our planet and human civilization, various indications point to the development of a more mind-based communication involving empathy and telepathy, the scale and scope of which will be like a third (r)evolution of language (after speaking, then writing). VIS promises a practical contribution toward realizing this potential future.

**ANDY HILTON** graduated in philosophy and led a bohemian life during his 20s until experiencing “initiation.” He then married and raised a family in Istanbul, Turkey, helping to establish a school and working as a proofreader-editor and university instructor in English as a Foreign Language (EFL). He has also contributed to scholarly articles on Turkey in the humanities and co-edited the volume, *Perspectives on Commoning*. Recently, a second initiatory process, or “regeneration,” saw him return to and expand his earlier interest in the immaterial and finally complete his book on *Anthropology and Mysticism in the Making of Initiation*.

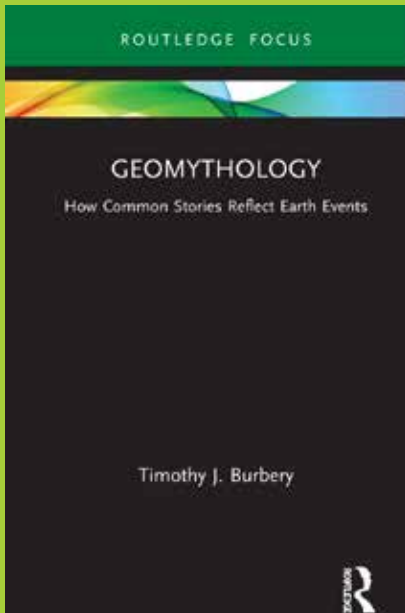


## ENDNOTES

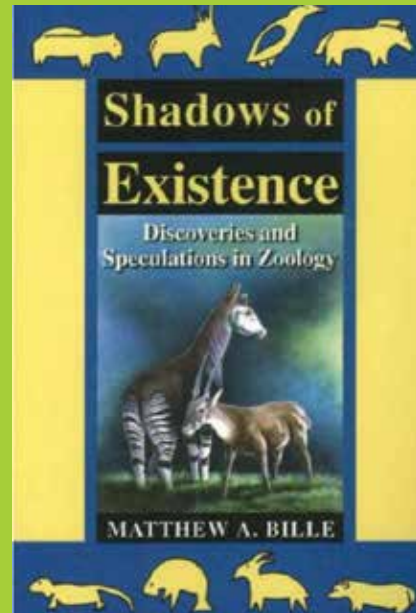
1. Yogananda, P. (1971 [1946]). *Autobiography of a Yogi*. Los Angeles: Self-Realization Fellowship Publishers.
2. Ring, K., & Cooper S. (1997). “Near-Death and Out-of-Body Experiences in the Blind: A Study of Apparent Eyeless Vision,” *Journal of Near-Death Studies*, 16(2), 101–147.
3. Ducasse, C. J. (1951). “*The Clairvoyant Theory of Perception* by M. M. Moncrief” [book review]. *The Journal of Parapsychology*, 15(4), 282, 1951.
4. “Psychic Carol Ann Liaros discusses Project Blind Awareness.” CarolAnnLiaros. <http://youtu.be/IRbtQitENLE>
5. Romain, J. (1924). *Eyeless Sight*. Trans. G. K. Ogden. New York & London: G. P. Putnam’s Sons.
6. M. B. (1924). “*Eyeless Sight*” [review]. *The British School of Nursing*, 72, 122.
7. Anon. (1924). “*Eyeless Sight*” [review]. *The Lancet*, 1/203(5246), 561.
8. Brugger, P., & Weiss, P. (2008). “The Non-Synesthetic “Palpability of Colors”. A Comment on Lerner (2006).” *Journal of the History of the Neurosciences*, 17(2), 253–255.
9. Naumov, E. K., Vilenskaya, L. V., Kliuchnikov, I.V. (1972). *Bibliographies on Parapsychology (psychoenergetics) and Related Subjects - USSR*. Washington: U. S. Joint Publications Research Service.
10. Charman, R. (2017-19). “Extraocular Image (China).” *Psi Encyclopedia*. <http://psi-encyclopedia.spr.ac.uk>.
11. Dobronravov, S. N., & Fischelev, Y. R. (1964). “Dermal Vision.” *Bulletin of Experimental Biology and Medicine*, 58(2), 894–897.
12. Rosenfeld, A. (1964). “Seeing Color with the Fingers.” *Life*, June 12, 1964, 102–113.
13. Novomeysky, A. (1990). “The press about ‘sight by skin.’” Genealogy of the Novomeysky Family. <http://novomeysky.genealogia.ru/papa/papae.htm>.
14. Puthoff, H. E. (1974). “Perceptual Augmentation Techniques.” SRI Project 3183, Progress Report No. 1. <https://www.cia.gov/readingroom/docs/CIA-RDP96-00787R000700100004-2.pdf>
15. Hopkins, L. F. (1988). *Mind Sight and Perception*. Washington: Valley Press.
16. Grinberg, J. (n.d.). “Experiencias de Jacobo Grinberg Zylberbaum con la Vision Extraocular” [trans. author]. <http://www.scribd.com/doc/253068652/Jacobo-Grinberg-Vision-Extraocular-pdf>.
17. Grinberg-Zylberbaum, J. (1982). “Psychophysiological Correlates of Communication, Gravitation and Unity: The Synergetic Theory.” *Psychoenergetics*, 257-274. <https://tinyurl.com/2d6scwrp>.
18. Friedrich, K. (2021). *Seeing Without Eyes*. Trans. U. Gérard. Norderstedt (Germany): Books on Demand.
19. Landoli, J. (2019). “Is the caudate-putamen an antenna for anomalous information?” *Nexus Newsfeed*. <https://www.nexusnewsfeed.com/article/consciousness/is-the-caudate-putamen-an-antenna-for-anomalous-information>.
20. Karagulla, S. (1967). *Breakthrough to Creativity*. Devorss & Co.
21. Neal, V. P. & Karagulla, S. (1983). *Through the Curtain*. Devorss & Co.
22. Bekhetereva, N. P. et al. (2002). “On the So-Called Alternative Vision or Direct Vision Phenomenon.” *Human Physiology*, 28, 16–26.
23. Tom Campbell. (2020) “Infovision—Mark Komissarov and Mihaela Istrati.” *Tom Campbell*. [https://youtu.be/s6\\_2uMTwqgw/](https://youtu.be/s6_2uMTwqgw/).
24. InfoVision interviews with Drs. Enrico Pierangeli (<https://youtu.be/byWNfa9N1PA>) and Ekio Conte. (<https://youtu.be/JIYSmYGtJKI>); Puthoff, op. cit.
25. Degani, I. (2019) “The Twins’ Lesson in Consciousness.” *Connection to Healing*, Oct. 25. <http://connectiontohealing.org/the-twins-lesson-in-consciousness>.
26. InfoVision Academy. (2020) “Observed Development in a Visually Impaired and Autistic Child.” *InfoVision Academy*, Oct. 27. <http://youtu.be/mQXC0QPNEto>.
27. Retaduari, Elza Astari. (2018) “Begini Latihan Tenaga Dalam Prajurit Kopassus.” *DetikNews*. Feb. 7. <http://news.detik.com/berita/d-3854599/begini-latihan-tenaga-dalam-prajurit-kopassus>.
28. Shen, D. (2010). “Unexpected Behavior of Matter in Conjunction with Human Consciousness.” *Journal of Scientific Exploration*, 24(1), 41–52.
29. McNamara, S. (2021). “Extending Seeing Without Eyes to Teleportation and Telekinesis...sharing information & past research.” *Consciousness Exploration with Sean McNamara*. [https://youtu.be/0ePDW\\_xwaeM](https://youtu.be/0ePDW_xwaeM).



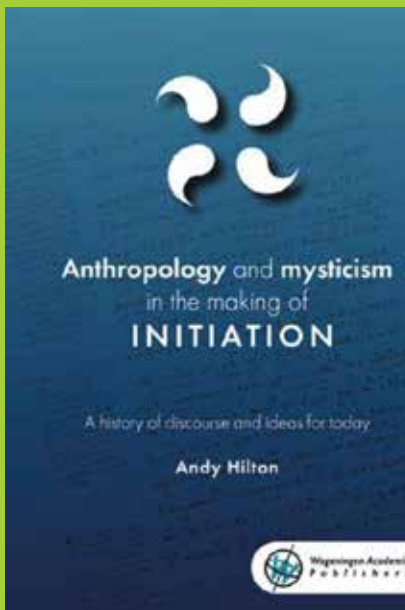
# Noteworthy Books



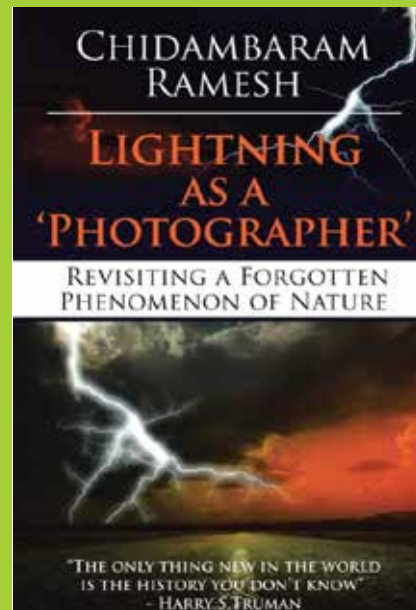
***Geomythology: How Common Stories Reflect Earth Events***  
By Timothy J. Burbery  
ROUTLEDGE, 2021



***Shadows of Existence***  
By Matt Bille  
HANCOCK, 2006



***Anthropology and Mysticism in the Making of Initiation***  
Andy Hilton  
WAGENINGEN ACADEMIC, 2019



***Lightning as a 'Photographer': Revisiting a Forgotten Phenomenon of Nature***  
by Chidambaram Ramesh  
PARTRIDGE INDIA, 2013

A Book Review by Matt Bille

# A Search for Doubtful or Dismissed Wildlife

**S***till Alive* is a rousing tale of adventure and discovery. Forrest Galante hosts the TV program *Extinct or Alive?* and, as described here, has found some surprising answers to the program’s title question in between dealing with storms, disease, corruption, and all the other impediments to learning whether a particular species or subspecies is still with us.

The book starts with his rewarding childhood of outdoor exploration in Zimbabwe, which turns to hell in a political upheaval. Relocated to California, Galante earns a degree in wildlife biology only to find it’s not a ticket to adventure. Instead, he’s employed in necessary but mind-sapping jobs, pulling weeds and counting ants. His break comes when his ability to find edibles in the wild makes him king of the TV competition program *Naked and Afraid*, leading to his career in the media.

The meat of the book is, of course, the hunt for animals whose current existence is doubtful or dismissed. In many, many searches, he’s found eight such animals. This section has exciting but also humorous moments for the reader, as when Galante dives in dangerous conditions searching for a missing African shark while his zoologist wife strolls along the beach with a photograph and finds one for sale. The book discusses his successes, which he marvels at, noting that the odds of finding something missing for decades in a two-week expedition are vanishingly small. His proudest moments are filming the Zanzibar leopard (*Panthera pardus adersi*) and locating a Fernandina Giant Tortoise (*Chelonoidis phantasticus*), a Galapagos Islands animal last seen in 1906.



Peter Mass/Wikimedia Creative Commons

Taxidermied Zanzibar leopard at the Zanzibar Natural History Museum, where it’s noted: “Now most likely extinct.”

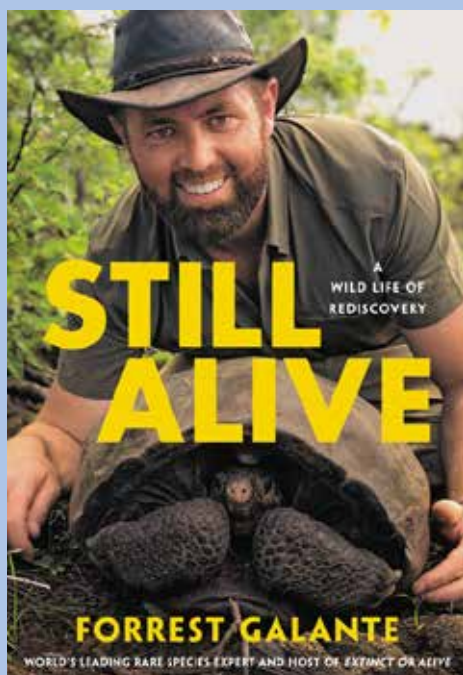
Galante writes that biologists from the Galapagos Conservancy, who were working with him looking for the tortoise, have unfairly downgraded his role. This brings up an important topic. This is Galante’s book and his account. Other writers and scientists have disputed proper credit for the tortoise and some other events, such as the rediscovery of the Rio Apaporis caiman (*Caiman crocodilus apaporiensis*), a surviving population of which had already been described from another location by a Colombian scientist. (An important footnote: Galante believes samples he collected show the caiman is not a subspecies, but a species in its own right. He has written elsewhere that he expects this to lead to a new scientific paper, which would be the first one he’s published based on *Extinct or Alive?* expeditions.)

Forrest Galante with *Caiman crocodilus apaporiensis*.

Extinct or Alive?/Discovery

I won’t go any deeper into that subject here. This is a review of the book itself, and the book is exciting and highly readable. Galante clings to precarious cliffs, narrowly escapes a (legally justifiable) arrest in Malaysia, has a deadly snake crawl over his back, and otherwise takes us to scary moments and plain hard work in exotic but rarely pleasant locations. He also looks for some animals, including the thylacine, which elude him.

The book has many implications for cryptozoology. While cryptozoologists celebrate his demonstrations of how “presumed extinct” animals can be found again, his only mention of the field is dismissive, and he has no interest in looking for Bigfoot and company. Cryptozoologists like Loren



***Still Alive: A Wild Life of Rediscovery***  
By Forrest Galante  
Hachette, 2021

Coleman have pointed out this is a distinction without much difference, as Galante uses the tools common to cryptozoology and “conventional” zoology, including anecdotes, historical accounts, fragmentary remains, and so on.

So is Galante a cryptozoologist who won’t say the word, or does he demonstrate that the conventional process is broad enough to include the methods of cryptozoology, meaning the latter is unnecessary? The difference seems to come down to what cryptids are involved. Galante looks for animals whose existence was established or at least well-reported but have dropped off the scientific map in the last century or so. Cryptozoologists do that (e.g., hunting for the thylacine) but include animals like the yeti whose existence was always disputed. On the cryptozoology podcast *Bigfoot and Beyond with Chris and Bobo*,\* Galante said he doesn’t look for “cryptids:” “I look for wildlife.”

Cryptozoology as a discipline was not addressed on this podcast, but there were other relevant tidbits. Galante said he’d never seen or found good evidence of a thylacine, hadn’t heard the term “Yowie,” and did not know much about Bigfoot (he hadn’t read the works of Grover Krantz or Jeff Meldrum). He said firsthand sighting reports are important to help plot

likely search areas, and citizen scientists have a role to play in providing that data. He emphasized that seeking local knowledge and assistance is mandatory. He considers it important to listen to local folklore and remember that zoological fact can be buried in what’s sometimes dismissed as “myth.” His suggestions for Sasquatch hunters were to do everything scientifically: put out fur traps to get DNA samples, put out more trail cams, and generally focus on hard evidence. He has been told of bipedal primate sightings (among countless other creatures) in Africa.

Galante claims some of his finds have redefined “extinction” or changed the way it’s declared, which is a bit of an overreach given that most of the creatures involved had not been officially declared extinct. He does enjoy proving wrong experts who tell him he has no chance of success, something we all like to do in our own fields. He uses the terms “extinct” and “species” too broadly at times. While he’s writing for a general audience, he could do better here. (I suppose also that compressing everything for TV doesn’t get one in the habit of explaining nuances.)

Galante includes some adventures not involving lost animals, such as catching a human-eating crocodile (the end of that tale will startle you) and documenting “wet markets” and the brutal Faroe Islands pilot whale drive. As a gadget lover, I enjoyed reading how he and his team jury-rigged gear or made on-the-spot changes of plan that enabled success. The book has a good photo section, but I would have liked some maps and an index.

Galante’s closing plea for conservation recognizes that species-finding, however valuable, is still little more than putting small bandages on a giant wound. His most basic recommendation to start caring about the planet: “Get outside.” So, take a hike and take this book with you for the breaks. You’ll enjoy it.

**MATT BILLE** is a naturalist, historian, and writer in Colorado Springs. He is a NASA-published space historian and has written on zoology and cryptozoology, most notably in his book *Shadows of Existence* (Hancock, 2006). Works in progress include *Books and Beasts: A Cryptozoologist’s Library*, and *Apex Predator*, a scientifically accurate thriller based on monster tales from Alaska’s Lake Iliamna. Matt created a popular site on the prehistoric predator *Dunkleosteus terrelli* (<https://www.facebook.com/DunkleosteusTerrelli/>), a species he wrote about for *Prehistoric Times*. He blogs on the latest science and technology news at Matt’s Sci/Tech Blog (<http://mattbille.blogspot.com>). He is a member of the British Columbia Scientific Cryptozoology Club and the National Association of Science Writers.



\* Forrest Galante Interview, *Bigfoot and Beyond with Cliff and Bobo*, January 2021. <https://www.listennotes.com/podcasts/bigfoot-and-beyond/ep-089-forrest-galante-aN8ihuQgvV/>



## ‘BACKSCATTER’

Chidambaram Ramesh

# Lightning Imprints: A Natural Imaging Process

History is filled with examples of how some unusual phenomena led to scientific discoveries. Nonetheless, hundreds of natural phenomena remain unexplored and uninvestigated. The photographic effect of lightning is one such natural phenomenon.

Occasionally, when animals or men are struck by lightning, they can develop impressions that seem identical to those left by nearby objects, persons, paintings, etc., immediately adjacent to the striking point, almost like a photocopy. The frequency of these cases resulted in the term “keraunography” (in Greek, *Kerauno*—thunder, *graphy*—to write) coined by Jean Christian Marc François Joseph Boudin, the Chief Medical Officer of the Military Hospital du Roule, France, in his *Treatise on Medical Geography*.<sup>1</sup> How a flash of lightning can transfer the image of the nearby scenario onto bodies and objects has been debated for more than a century.

In 1861, Professor Andres Poey, director of the Physio-Meteorological Observatory at Havana, Cuba, examined 24 cases of lightning, creating photographic-like impressions on human and animal bodies. Among the impressions were trees, crosses, circles, coins, horseshoes, and more. According to Charles Fort, who published four monumental collections of anomalous events during his lifetime, in some towns in Germany in 1872, crosses and other figures appeared over windows “in some unaccountable way.” Emanuel N. Santini, the editor of *La Science En Famille*, a popular science magazine, reported such occurrences in his text *La photographie a travers les corps opaques par les rayons électriques, cathodiques et de Röntgen*.<sup>2</sup> In *Les caprices de la foudre* (1905), the astronomer Camille Flammarion added a whole series of similar events. To explain its cause, he relied on the same explanatory model Santini used before him—they were lightning photographs; the pictures it engendered were “reproductions”; the victim’s skin served as a “sensitive photographic plate” in this natural imaging process. Some factors Santini cited for the formation of photographic records were electricity, cathode radiation, and X-rays. Flammarion and Santini described these phenomena as genuine photographic processes.<sup>3</sup>

During research for her novels, Augusta Evans Wilson (1835–1909), collected accounts of four or five instances of faces being photographed on windows by flashes of lightning. One instance of lightning photography took place in the house of Wilson’s uncle, Dr. Novborne B. Powell of Chunnenugee Ridge, Alabama, in about the year 1873. Relatives testified that the image of Dr. Powell’s wife was photographed on a pane of glass during a severe electrical storm. Mrs. Powell’s distinctive cap and her large cameo pin were recognizable in the picture.<sup>4</sup> The imprints made by lightning were “photograph-like representations” not merely *pareidolia*—reading meaning into random patterns.

## Historical Instances of Lightning Imprints

It appears that lightning imprints were first mentioned in a book by St. Gregory of Nazianz, who claimed that in 360 A.D. lightning printed images on the bodies and clothes of workers repairing the temple in Jerusalem. He stated that the workmen taking refuge in the church had “figures of crosses” mysteriously printed on their clothing and bodies.<sup>5</sup>

Abbe Lamy published another curious fact regarding lightning impressions in the *Journal des Savants* in 1690. During a lightning strike on the Church of St. Sauveur at Langy in France on July 18, 1689, Latin words from a prayer book were instantly printed on top of the altar cloth. There was a reversed and enlarged version of the service card, but it was missing the holiest words: *Hoc est corpus meum* and *Hic est sanguis meus*. Father Lamy saw right away that the omitted words were the red-ink words on the card and that the lightning had just relayed the main words in black. It’s thought that the altar cloth may have contained metallic salts and must have been damp at the time of exposure. Since it struck at night, the impression was given time to dry and become permanently fixed before morning. In any case, this still doesn’t explain why the impression was placed on the cloth beside it rather than under or above.

Many newspapers, including the *Utica Herald-Dispatch*, reported that on August 5, 1904, a wandering painter named Abbott Parker was struck by a bolt in Morristown, New Jersey, and knocked out. When he was picked up, there were large streaks all over Parker’s back. At the hospital, the streaks began to resemble a cross and, eventually, the image of Christ nailed to the cross became clearer with hands and feet as plain as if they had been painted, a wound on the man’s side, and a Crown of Thorns above on the large crucifix hung over his head.<sup>6</sup>

*The Morning Oregonian* of July 9, 1906, told of a Mrs. Thomas Lynch who was picking lettuce from her garden at 416 Fulton Street, Union Hill, one afternoon when a great storm blew in. She carried a glass dish to her gate. Suddenly, lightning struck so close it shocked her hand. Her fingers gripped the dish so tightly that she was unable to release it. Eventually, the numbness left her arm, her muscles relaxed, and the dish became easier to hold. The next morning, the arm was blackened and swollen. Between the shoulder and elbow, pale figures appeared. The result was a bird-like-a-pheasant, a snake, and symbols like those found on Chinese tea boxes.<sup>7</sup>

In Hilldale County, Michigan, in 1887, a lightning flash produced a bizarre but carefully authenticated result. *The Chicago Tribune* reported that thunderstorms in the region were nearly nonstop throughout the evening. Farmer Amos J. Biggs, who lived midway between Hilldale and Jonesville,

went out into his backyard just before the storm broke to scare away cat fights on his woodpile. They allowed him to get within a few feet. As lightning struck the woodpile, a bright flash followed by a loud crash, shattering all the woodblocks and killing all the cats. The lightning also perfectly detached the sole of Biggs' left boot, in addition to rupturing the cover of Biggs' watch. There was no pain in Biggs' arm, just a few sharp muscle contractions. After his return to his home, Biggs' wife fainted. A black cat was silhouetted with precision on "his bald front." To remove the obnoxious portrait, they tried soap, brick scouring, vinegar, and ash, without success. But time faded the painting by the next morning.<sup>8</sup>

### Hologram-Like Photo of a Boat

Lightning strikes can play strange tricks, such as photographing a steamboat on a mirror. A heavy thunderstorm emerged while the mirror was being transported from Chattanooga, Tennessee, to Decatur, Alabama. *The New York Times* of March 13, 1904, recounts: "While the storm was at its height, another steamboat passed the first, and it was observed that the second boat was reflected in this mirror, which was on the lower deck of the first boat, facing the water. No particular attention was paid to the incident until a few days ago, when the owner, standing almost parallel with the mirror, happened to glance across its surface. There he saw a perfect photograph of the river craft. It was found upon investigation that the likeness could not be removed, and could be seen only from one angle."<sup>9</sup>

In 1896, *The New York Times* published an article, "The Queer Photograph on the Wall: Effect of a Vivid Flash of Lightning," reprinted from the *Rochester Democrat*, relating that in early summer, a frame house on the west side of West Street in Fairport was hit by lightning, its chimney was demolished, and some damage was done to the inside. A "blank white wall" stood opposite the two east-facing windows in the upper front room. The street-facing side of the house was now precisely depicted on the blank wall. "The picture was perfect and distinct as a photograph on a negative."<sup>10</sup>

In *Thunder and Lightning* (translated from French by Walter Mostyn), Camille Flammarion compiled many instances of lightning imprints not only on the human body but also on solid objects like windowpanes, walls, etc. He related that the Republican, Abner Millikan, built a huge barn on his farm decorated with portraits of President William McKinley and Vice President Garret Hobart. When lightning struck the building several times during a violent storm, the portraits were destroyed, but the lightning had left marks tracing the politicians' faces on the wall.<sup>11</sup>

### Understanding the Science Behind the Phenomenon

Many old ideas and concepts are seen as quaint, eccentric, and pointless. It is not for lack of evidence, but rather for lack of a theoretical framework that would enable it to fit within prevailing science paradigms.

Nature tends to transmit information in the form of "pictorial representations." This phenomenon indicates, among

other things, that pictorial representations can be transferred to human skins without the use of an intervening physical medium, and that human skin is receptive to imprinting such pictorial images. Psychophysical structures appearing on the body due to mental stigmata further strengthen the fact that the human body is susceptible to the appearance of images.

At this junction, a question may arise: how is the exact visual information transmitted without any medium? The electromagnetic waves produced by lightning are coherent waves capable of carrying the holographic geometric information of objects they pass through. These holographic transformations form space-time order from a spectral dimension of frequencies. The mathematical formulation forming the holographic transformation is called "Fourier Transformations" after the 18th-century French mathematician who described it. Holography inventor Dennis Gabor applied Fourier Transformations to create the hologram showing how Fourier Transformations of the interference pattern can be used to rebuild the object's virtual image by applying the inverse process. He demonstrated that objects in space-time could be rebuilt in a virtual form from a dimension of frequencies. A Fourier Transform (FT) is a mathematical way of expressing or transforming any simple or complex pattern (for instance, a picture or image or a design) into a language of simple waves, and these waveforms can again be transformed into the respective patterns or images.

Parallax and viewing at an angle are the consistent features of a hologram. While looking at stereo-metric holographic displays, one can move one's head and observe the image continuously changing with the viewing angle. Another trait of a hologram is an optimal viewing distance to see the image. In many lightning imprints, this effect of parallax or "viewing at an angle" has been recorded by the observers. In the steamboat image recorded on an opposite mirror, the observer could notice it only when standing almost parallel with the mirror and not otherwise. In some other cases, the images were noticeable only when the Sun was in a certain position. In some cases, people who have noticed the mysterious faces appearing on windowpanes have also recorded that they could see the images plainly when standing at a certain angle with the panes. There are other remarkable features of these lightning imprints that attest to the optical effect of their cause. In some cases, especially where portraits of more than one person are displayed, the figures seem to overlap each other. In one extraordinary case, a woman's face was imprinted on the windowpane in a very peculiar way; it was a whole face, which was formed of numerous small faces. Together, all these observations suggest the "holographic" nature of lightning imprints.

### Lichtenberg Figures

Lightning sometimes leaves dendritic patterns on the body of the victims. This manifestation was first identified in the laboratory by German physicist George Lichtenberg. In a paper read by Professor C. Tomlinson of King's College before the British Association at Manchester in 1861, he demonstrated that the ramified figures so often observed on the bodies of lightning



The arm of a 24-year-old electrician after being struck by lightning in May of 2011.<sup>12</sup>

victims were not derived from any tree but represented the fiery hand of lightning itself. He exhibited some of these figures as produced by the discharge of a Leyden jar, and it was generally allowed that the resemblance to a tree was sufficient to lead an ordinary observer to connect the ramified figure found on the body of a person struck by lightning with the tree under which he sought refuge. Thus, when the “photographic properties” of lightning was strenuously advocated by some observers, skeptics advanced the theory that the floral impressions occasionally made by lightning were not photographic reproduction of the trees or leaves but marks formed by the transmission of static electricity along the superficial blood vessels that nourish the skin. Though the advocates of this theory were right in their argument, they failed to distinguish between the tree-like images produced by some lightning strikes and the photographic reproductions of statues, paintings, scenery, objects, animals, and so on, which have no resemblance to tree branches.

## Conclusion

One might wonder why lightning imprints mostly relate to religious imagery, such as crosses, crucifixes, virgin Mary, Jesus Christ, etc. Perhaps it's because people have a propensity to see and recognize religious-related imagery. One might also wonder why there are not more contemporary cases. But I would argue that the many so-called “spontaneous” appearances of ghostly images on window panes, glasses, etc., that we hear about frequently are likely due to the curious action of lightning.

Like the apple falling on Newton, nature enlightens us. It's time to see this extraordinary phenomenon in a different light. Keraunography deserves a second look by science.

**CHIDAMBARAM RAMESH** is a graduate in Engineering from Madurai Kamarajar University, India. He is a freelance researcher and writer working to re-discover and re-establish many forgotten, scientifically important ideas of ancient times by bringing them under the realm of current science. He is the author of many books, including the *Thought-Forms and Hallucinations: Some Curious Effects of the Holographic Mind Process* and *Lightning as a ‘Photographer’—Revisiting a Forgotten Phenomenon of Nature*. His current interests include consciousness studies. His forthcoming book is *Embodied Imaginations: Experiential Crossing of Fictional Characters into the Real World*.



## REFERENCES

- 1 Boudin, Jean Christian Marc François Joseph. (1857). *Géographie Médicale*, Paris.
- 2 Geimer, P. (2018). *Inadvertent Images: A History of Photographic Apparitions*. (G. Jackson, Trans.) Chicago and London: University of Chicago Press.
- 3 Ibid.
- 4 Fidler, W. P. (2003). *Augusta Evans Wilson, 1835–1909*. University of Alabama Press.
- 5 Chambers, William and Robert. (1861). *Chambers's Journal of Popular Literature Science and Arts*. W & R Chambers.
- 6 “Image of Christ on Man's Back.” (1904). *Utica Herald-Dispatch*.
- 7 “Odd Freak of Lightning.” (1906, July 9). *Morning Oregonian*. Retrieved Aug. 15, 2021, <https://oregonnews.uoregon.edu/lccn/sn83025138/1906-07-09/ed-1/seq-3>.
- 8 “Photographed by Lightning.” (1887). *The Locomotive*, Vol. VII, p. 134. Reprinted from *The Chicago Tribune*.
- 9 Lightning as a Photographer. (1904). *The New York Times*, March 13. Retrieved Aug. 15, 2021, <https://www.nytimes.com/1904/03/13/archives/lightning-as-a-photographer.html>
- 10 “The Queer Photograph on the Wall: Effect of a vivid Flash of Lightning.” (1896). *The New York Times*, March 3. Retrieved Aug. 15, 2021, <https://timesmachine.nytimes.com/timesmachine/1896/03/03/104111735.html?pageNumber=7>
- 11 Flammarion, C. (1905). *Thunder and Lightning*. (W. Mostyn, Trans.) London: Chatto & Windus. Retrieved August 15, 2021, from <https://www.gutenberg.org/files/42245/42245-h/42245-h.htm>
- 12 Stanford, Judie Lipsett. (2011). “Meet Winston Kemp, Lightning Strike Survivor and Lichtenberg Figure Owner,” *GearDiary*, June 17. Retrieved Aug. 18, 2021, from <http://geardiary.com/2011/06/17/meet-winston-kemp-lightning-strike-survivor-and-lichtenberg-figure-owner>