

Payton Yerke

Professor Christensen

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The Science of Ghosts and the Essence of the Human Soul

Ghosts and the sense of an afterlife have enthralled our imagination, media, and religions for centuries. In a recent poll, it was found that 45% of all Americans believe ghosts to be real (Gayomali). In a separate poll, 22% reported sensing a ghostly presence or experiencing an apparition (McDonald). As a young teenager, I remember going out on late night ghost-hunting trips with the latest teenage-ghost-hunting equipment: a camera phone to record what we saw. Most of the time we never saw anything at the reportedly haunted locations we visited, but there were also the rare occasions where unexplained shadows, movements or, even, figures occurred. With so much reported phenomena, can the existence of poltergeists be supported or proven scientifically or is it merely an illusion born of religious faith?

Religion contributes significantly to the belief in the human soul and ghosts. For those of Christian-based faiths, a common belief is that eternal life will be awarded to the faithful. With such views, death is seen, not as a termination, but as a transformation from their corporal selves to an eternal being that will then go to Heaven and return to God or their Creator. This conviction of the essence of a human soul is essential to support the tantalizing idea of everlasting life after death (Handley).

Religious beliefs in the afterlife have prompted the scientific investigation to determine whether we, as humans, possess a soul and if the soul continues to live after our mortal death. A study was conducted by Robert Schoch, the Associate Professor of Natural Science at Boston

University, on the near-death experiences and the correlation between geomagnetic waves on brain waves. The study resulted in the theory of crisis apparitions, which occur when an individual sees the ghost of a faraway relative moments before the individual dies. In regards to the study, Schoch explained, "Some people will dismiss this as coincidence, but there have been, in my assessment, very good statistical studies of such things that take it out of the realm of coincidence" (McDonald).

Further studies regarding the existence of a human soul have been conducted. One such experiment done by Dr. Duncan MacDougall in 1907 studied the weight fluctuations during the death process. Six terminally ill patients were observed before, during, and after the death process. They were placed on a bed that would record the patients' weight, sensitive to two-tenths of an ounce. In detailed, written accounts of his study, MacDougall explained that, with every patient, the rate of weight-loss, due to perspiration, evaporation of moisture and moisture of respiration, during the death-process was calculated. At the exact moment of death for each patient, there was a sudden loss of weight of approximately 21 ounces. Further investigation of this sudden weight loss found that the bowels did not move, no urination occurred and the loss of air in the lungs did not affect the patients' weight. MacDougall concluded that the loss of weight was not a product of physiological attributes, rather from spiritual. He theorized that the loss of weight is a result of the human soul leaving the body (MacDougall).

Another experiment investigating the correlation of the human soul and near death experiences (NDEs) was conducted by Kumar Pranab Bhattacharya in 2013. According to Bhattacharya, an NDE refers to a broad range of experiences of people associated with impending death. However, somehow these people managed to be revived back to life. Cases of NDEs are often reported after people have been pronounced clinically dead or close to death.

These reported experiences include a review of one's life, an out-of-body experience or astral projection, visions of themselves passing through a dark tunnel, seeing a bright light, seeing and talking to God, seeing foreign lands, seeing dead relatives, or seeing the future. To further support these reports, most people who underwent a NDE, even people who are non-religious, reported substantially decreased fear of death and an increased acceptance of an afterlife and reincarnation (Bhattacharya).

Many skeptics challenged the results found by Bhattacharya. The major controversy occurred when other chemical factors were found that produced experiences similar to that of NDE. Chemicals such as Ketamine, Phencyclidine, LSD, pilocarpine, and mescaline induce experiences that consist of unconsciousness, out-of-body experiences, and occurrence of a bright light. Nonetheless, these experiences are not identical to NDE in that they are characterized by fragmented and random memories rather than a recollection of one's entire life. They also lack the decreased fear of death that individuals who experienced an NDE obtained (Bhattacharya).

The presence of near death experiences and the faith in a human soul evokes the mystery of life after death. Like Christians, Hindus, Buddhists, and Jews believe in spirits. However, Hindus, Buddhists, and Jews believe that the spirits of the dead can attach themselves to places, people, possessions or pleasures that cause the individual to be in spiritual limbo. These spirits are seen as suffering people that need help moving on to the afterlife. Buddhism teaches methods on how to free ghosts from earthly bondage by directing them toward the golden light. These religions also believe that spirits of deceased individuals can attach and possess the bodies of the living in order to influence the host. As a result, Judaism teaches rituals of ghost exorcism that both heals the ghost and the host. Although the West is highly influenced by the Christian belief,

the idea of ghosts walking among us, haunting a location, or possessing the living endures throughout the generations and has both frightened and fascinated us (Handley).

Ghost stories have endured throughout the centuries. The first reported poltergeist experience dates back to Pliny the Younger in the first century A.D. in Athens, Greece. He described his poltergeist experience in a letter to Licinius Sura:

There was at Athens a large and roomy house, which had a bad name, so that no one could live there. In the dead of the night a noise, resembling the clashing of iron, was frequently heard, which, if you listened more attentively, sounded like the rattling of chains, distant at first, but approaching nearer by degrees: immediately afterwards a spectre appeared in the form of an old man, of extremely emaciated and squalid appearance, with a long beard and disheveled, hair, rattling the chains on his feet and hands (Younger).

The existence of earthbound spirits, or ghosts, has been questioned and studied upon multiple accounts. In an interview with ghost expert, Michael Lopez Sr., he explained that the human body is composed of energy. As humans, we all give off different types of energy, or auras. The energy within us can be measured on a spectrum of high to low. Bad spirits and demons give off low energy levels, while good spirits give off high energy that the living can physically feel. Some people, including himself, are more sensitive to energy and can sense or even see and converse with spirits. He gave detailed experiences where, as a child, he would ask spirits for a ride on his sister's bed. In response, the bed would begin to shake and move around the room. He theorized that the spirits were able to accomplish this action because they were composed of energy and had the ability to manipulate the energy around them (Lopez).

Most theories involving ghosts as beings of energy claim that the transition between the mortal and spiritual worlds are in relevance to Einstein's Law of Conservation of Energy. The Law of Conservation of Energy states that the total amount of energy in an isolated system remains constant over time. For an isolated system, this law means that energy can change its location within the system and change its form within the system, but that energy can be neither created nor destroyed. The human body generates enough electricity to sustain a small flashlight. If energy cannot be destroyed, rather it can be transformed, then what happens to the electricity in the human body after death? Ghost researcher and notable author, John Kachuba, wrote:

Einstein proved that all the energy of the universe is constant and that it can neither be created nor destroyed. ... So what happens to that energy when we die? If it cannot be destroyed, it must then, according to Dr. Einstein, be transformed into another form of energy. What is that new energy? ... Could we call that new creation a ghost (Kachuba)?

Skeptics dismiss John Kachuba's theory of the Law of Conservation of Energy as a false explanation of ghosts, claiming that after death the energy of the body passes through an ecosystem via photosynthesis and the consumption of organisms. When the human body is deceased, it begins to decompose and the energy stored within the body is lost to heat or is consumed by microorganisms and other organisms. Though Kachuba uses the language of science to support his theories, he lacks the understanding of energy processes, scientific experimentation, and data to support his ideas. In a sense, Kachuba is attempting to use science to explain phenomenon that exist beyond the realm of normal science.

While Kachuba tried to use science to justify his spiritual beliefs, real scientists have used new technology to discredit many reports of haunting and poltergeist experiences. In a careful

case study, William Holland Wilmer examined the past documentation of a haunting witnessed by the “H” family after they moved into an old, large and gloomy house that was presumably haunted in 1912. Mrs. H kept a journal of the odd happenings within the house. She described pots and pans that crashed seemingly on their own, strange voices calling out the names of Mrs. H and her children, and footsteps that could be heard throughout the hallways. She also described feeling presences and seeing dark figures. She wrote, “On one occasion, in the middle of the morning, as I passed from the drawing room into the dining room, I was surprised to see at the further end of the dining room, coming towards me, a strange woman, dark haired and dressed in black.” In another account, she wrote, “It had always been Mr. H’s habit at night before going to bed to sit in the dining room and eat some fruit. In this house when seated at night at the table with his back to the hall, he invariably felt as if someone was behind him, watching him. He therefore turned his chair, to be able to watch what was going on in the hall.” Over time, the inhabitants of the household grew extremely tired, depressed, and sluggish. They all developed colds and headaches that couldn’t be relieved. After a while, all the plants within the house withered and died (Wilmer).

After investigating the house, Wilmer found an odd culprit behind the presumed haunting; it was carbon monoxide poisoning. He found that the furnace was leaking the odorless gas through the chimney, thus causing oxygen deprivation. The deprivation of oxygen was causing the illnesses and hallucinations witnessed by the “H” family (Wilmer).

Other surprising factors have also led to the perception of paranormal activity. Stimulation of the Angular gyrus within the brain creates similar experiences that are often reported as paranormal. Excessively stimulating the Angular gyrus results in the perception and hallucination of shadowy figures. In a study done by Michael Persinger Spain, he utilized a

helmet that emitted electrodes into the brain to directly stimulate the Angular gyrus in order to induce the presence of angels and demons. Eighty percent of all the participants reported seeing a shadowy figure standing beside them in the experimentation room. Furthermore, the location and presence of the figure could be directly controlled by the currents of the electrodes emitted from the helmet and the location at which they stimulated the Angular gyrus (Green).

How the brain reacts to energy waves and electrical impulses plays a key role in reported hauntings. In a published encounter, Vic Tandy, from the School of International Studies and at Law Coventry University, was working in his classroom medical lab in 1998. Ghostly encounters began to be reported from both the staff and students. A custodial lady even resigned after witnessing a paranormal apparition. Many of the students, and Tandy himself, reported seeing a dark figure out of the corner of their eye watching them. However, whenever someone turned to face the figure, it had vanished. One day, Tandy brought a fencing sword into the laboratory. As he entered, he noticed that the free end of the blade was frantically vibrating up and down. The vibrations were varying in intensity at a rate equal to the resonant frequency of the blade, which is a characteristic identical to that of energy emitted by sound waves at a low frequency, otherwise known as infrasound waves (Tandy and Lawrence).

Infrasound waves usually can't be perceived by human ears because they vibrate 1 to 20 vibrations per second, which is too low for the human range of hearing. However, humans can sense the presence of infrasound waves. Encountering infrasound waves can cause nausea, anxiety, and chills. It can also trigger the brain to slightly vibrate the eyeballs, which can make the victim experience hallucinations, such as shadowy figures (Tandy and Lawrence).

Further investigation into the source of the infrasound waves established that the vibrations got bigger as the blade was moved towards the middle of the room and the amplitude

of the vibrations greatly reduced or stopped altogether as the sword got closer to the walls of the room. The culprit behind the infrasound waves was a newly-installed fan, with a frequency of 18.98 hertz. The sound waves originating from the fan resonated around the room and bounced off the walls which caused it to collide with itself, creating a strong standing wave in the middle of the laboratory (Tandy and Lawrence). Other researchers used Tandy's scientific findings to discredit other reported hauntings. However, these researchers have not succeeded in tracing all reported encounters with the supernatural back to psychological misperceptions.

Tandy's discovery of environmental factors contributing to poltergeist events prompted Richard Wiseman to investigate, through multiple experiments, other environmental factors resulting in the perception of a presence or paranormal encounter. One such experiment conducted by Wiseman involved South Bridge in Edinburgh, Scotland. South Bridge was constructed in the late eighteenth century. For a public service, a series of rooms and corridors were built under the bridge to house the poor and homeless. Due to overpopulation, these vaults became disease-ridden and abandoned in the late nineteenth century. In 1997, the vaults were reopened and became an attraction for public tours. Not long after the reopening of the vaults, tourists began to report feeling presences, unusual footsteps, and the appearance of spirits in some of the rooms. Wiseman designed an experiment to see if people who were not familiar with the reputations of each of the rooms would sense anything unusual with them (R. Wiseman, C. Watt and P. Stevens).

In a four day trial, volunteers toured the vaults and recorded any unusual experiences of phenomenon they experienced. Architecture, lighting levels, air movement, temperature, and magnetic field levels were also prerecorded. When the final data was examined, the volunteers were consistent with rating certain rooms as more haunted than others. This data also correlated

with past records of haunting reports kept by the tour company. However, when the environmental factors of all the rooms deemed as haunted were taken into account, the volunteers were more likely to have reported unusual experiences in rooms with high ceilings, high levels of exterior lighting directly outside the vault, and high magnetic field levels. Wiseman concluded that people report more haunted experiences because they feel more vulnerable in a room with a high ceiling and when they walk from a well-lighted area to a darker room. Furthermore, the strong magnetic waves found in all the reportedly haunted rooms stimulates the Angular gyrus, creating a feeling of anxiety and fear (R. Wiseman, C. Watt and P. Stevens).

In another experiment conducted by Richard Wiseman, he investigated the correlation between reported hauntings and the belief in ghosts. His experiment took place in Hampton Court Palace, one of the most reportedly haunted places in England. His experiment was meant to discover the extent that belief in ghosts, suggestion, and magnetic fields accounted for the alleged hauntings. Over 600 participants took part of the experiment, and each participant was given a questionnaire that measured their belief in ghosts, past unusual experiences and whether they believed ghosts were the underlying reason behind the unusual experience. After reporting all the occurrences of unusual happenings while in Hampton Court, Wiseman concluded that participants who had previous beliefs of the paranormal reported experiencing more frequent anomalous activities and were more likely to attribute them to a spiritual presence (R. Wiseman, C. Watt and E. Greening).

In the second portion of the experiment, half of the participants were told prior to entering Hampton Court that it was historically associated with hauntings and other paranormal activity. The second half of the study group wasn't told anything about the area's history before

entering. The relationship between suggestion and the reported results of paranormal activity was significant. Also, results supported the association between reported poltergeist and magnetic waves (R. Wiseman, C. Watt and E. Greening).

Psychological advancement and understanding has explained many physiological effects that correspond with a spiritual encounter. Oftentimes, the encounter with a threatening spirit is reportedly characterized by a sense of awaking from a sleep with bodily paralysis. Imagine trying to move or scream but, regardless the struggle, the body won't respond. In addition, many reported experiences described feeling crushed by an invisible presence. During these experiences, many reports of unnerving blurry figures, whispers, and footsteps occurred. This phenomenon is commonly referred to as "ghost press" in the Chinese culture. However, further investigation behind the psychological aspects of ghost press presented a new understanding of this spooky occurrence. Rather than a poltergeist experience, ghost press is simply sleep paralysis. Dr. Priyanka Yadav of the Somerset Medical Sleep for Life Center in New Jersey explains that the phenomenon occurs when there's a disconnect between the mind and body as people enter or exit REM sleep. In a sense, it is equivalent to dreaming while awake. "It seems like you're paralyzed, which naturally occurs when you're sleeping, but this somehow happens while you're awake. It can last from a few seconds to a minute or two and is often associated with hypnagogic hallucinations, things you might see when trying to fall asleep or hypnopompic hallucinations, things you see when you're trying to wake up." To further support this theory, 79% of ghost press occurrences were reported between 2 a.m. and 5 a.m., the most common time-frame that the human brain causes hallucinations (Gayomali).

In conclusion, both believers and skeptics approach the human soul and the existence of an afterlife, whether on Earth as a ghost or in some other realm, as a metaphysical idea that is

difficult to verify with concrete scientific evidence. Believers regard the soul as the essence of our consciousness; skeptics regard it as an illusion. Scientists have yet to prove or disprove its existence. Scientists have explained some supposed spiritual encounters as illusions caused by biochemical disruptions. Still, they have not yet fully explained other reports, particularly those of near death experiences. Skeptics still discredit those reports saying they are from individuals drawing on hope and religion, not science. But when will science disprove hope or religion? When exploring the realm of the metaphysical, we find the door to faith is always open.

Works Cited

- Bhattacharya, Pranab Kumar. "Is there science behind the near-death experience: Does human consciousness survives after death?" *Annals of Tropical Medicine & Public Health* (2013): 151-165. *Academic Search Premier*. 21 October 2014.
- Gayomali, Chris. "4 possible scientific explanations for ghosts." *The Week* 25 October 2013. Web.
- Green, Laci. *Do Ghosts Exist? Exploring the Paranormal* 2013. Web.
- Handley, Sasha. *Visions of an Unseen World: Ghost Beliefs and Ghost Stories in Eighteenth-Century England*. London: Brookfield, 2007. Print.
- Kachuba, John. *Ghosthunters: On the Trail of Mediums, Dowsers, Spirit Seekers, and Other Investigators of America's Paranormal World*. New Page Books, 2007. Print.
- Lopez, Michael I. Interview. Payton Yerke. 18 October 2014.
- MacDougall, Duncan. "Hypothesis Concerning Soul Substance." *American Medicine* 2 (1907): 395-397. Web.
- McDonald, Glenn. "Ghost Stories: The Science Behind Sightings." 29 October 2013. Web.
- Tandy, Vic and Tony R. Lawrence. "The Ghost in the Machine." *Journal of the Society for Psychical Research* 62.851 (1998). Web. 1 November 2014.
- Wilmer, William Holland. *American Journal of Ophthalmology* 17.6 (1934): 522–523. Web. 29 October 2014.
- Wiseman, R, et al. "An investigation into the alleged haunting of Hampton Court Palace : Psychological variables and magnetic fields." *Journal of Parapsychology* 66.4 (2002): 387-408. Web.

Wiseman, Richard, et al. "An investigation into alleged 'hauntings'." *British Journal of Psychology* 94 (2003): 195–211. 30 October 2014.

Younger, Pliny the. *Pliny the Younger (A.D. 62?–c.A.D. 113). Letters*. 27 March 2013. Web. 21 October 2014.

Bibliography

Houran, James and Rense Lange. "Searching for an Optimal Level of Transliminality in Relation to Putative PSI." *Journal of the Society for Psychical Research* (2009): 92-102.

Academic Search Premier.

Radford, Benjamin. *Do Einstein's Laws Prove Ghosts Exist?* 9 November 2011. Web. 19

September 2014.

The Museum of Unnatural Mystery. *The Science of Ghosts and Hauntings*. 2009. Web. 28

September 2014.

What are Ghosts Really? 5 Paranormal Theories. 28 July 2014. Web. 28 September 2014.

Wilson, Tracy V. *How Ghosts Work*. 27 October 2006. Web. 28 September 2014.