

Magnetic Fields and Haunting Phenomena: A Basic Primer for Paranormal Enthusiasts

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Introduction

One need not be a chamber to be haunted,/One need not be a house;/The brain has corridors surpassing/Material place.

- Emily Dickinson, "Ghosts" (circa 1896)

...No one's at the door. You suggest a ghost perhaps a phantom I agree with this in part. Something is with us I can't put my finger on...

- Tori Amos, "Wednesday" (2002)

Reports of haunting phenomena are often characterized by two types of ostensibly anomalous phenomena that may repeatedly occur over long periods of time in a given location. There are subjective phenomena that tend to be experienced by our senses, such as seeing apparitions or ghosts, sensing an unseen presence (sometimes accompanied by feelings of apprehension or fear), and hearing various kinds of sounds that may either be suggestive of physical disruptions (e.g., crashes and banging noises) or be suggestive of a presence (e.g., voices, footsteps, doors opening and shutting). Then there are phenomena that may have some degree of physical objectivity, such as floating lights ("orbs"), temperature variations ("cold spots," which can also be subjective, but may sometimes be measured with a thermometer), electrical disturbances, and the occasional instance of apparent object movement.

One of the goals of haunting research has been to determine whether or not such phenomena may have a rational explanation in terms of the known principles and laws of physics. Parapsychologists often take measurements of the surrounding physical environment in reportedly haunted areas to see if, and how, they may differ from control areas that have had no reports of hauntings. One of the rather consistent findings to emerge from taking such measurements is the indication that haunting occurrences may be associated with magnetic field activity. Additionally, many amateur paranormal enthusiasts have been taking measurements using magnetometers in their attempted efforts to search for spirits in reputedly haunted houses (Coghlan, 1998 – 1999). Here, we wish to provide a basic primer – a sort of "crash course," if you will – on what parapsychologists have learned about magnetic fields and hauntings, so that their findings may help guide the efforts of paranormal enthusiasts in conducting their investigations. We give a basic overview of magnetic fields and how they might relate to hauntings based on the current parapsychological literature, and provide some useful tips on what to look out for during field investigations and how to properly interpret findings. This will help make sure that any measurements taken by paranormal enthusiasts are a bit more reliable, better collected, and more soundly interpreted.

We begin with the recognition that there are two main types of magnetic fields that paranormal enthusiasts should be aware of: geomagnetic fields and electromagnetic fields.

Geomagnetism

Geomagnetic fields are DC fields that are produced naturally by the Earth. Although the precise mechanisms have not yet been fully worked out, it is thought that the Earth's magnetic field is largely produced through the fluid motion of the Earth's molten iron core (Buffett, 2000). The circular motion of the core may give rise to electrical currents, which in turn generate a magnetic field [1]. Although the geomagnetic field (GMF) of the Earth averages around 500 milliGauss [2], there are a number of things that can produce notable changes in the strength of the GMF in certain areas of the planet. These can include seismic activity along fault zones (Persinger, 1985), electrical activity during thunderstorms, and large amounts of magnetic or electrically conductive minerals present in the surrounding geology of a given area. In addition, increases in cosmic radiation from space, as a result of sunspots, solar flares, and similar stellar phenomena, may sometimes greatly change the GMF strength as this radiation interacts with the boundary of the GMF in the upper atmosphere (Lyon, 2000), one of the things that can lead to geomagnetic storms.

There has been considerable evidence gathered to suggest that certain forms of human behavior (e.g., sleep disturbances, mood shifts, and increases in anxiety) may coincide with changes in the activity of the geomagnetic field (see Persinger, 1987, for a review of this evidence), suggesting that the GMF may interact in some way with the workings of the brain. Some studies also suggest that people who happen to have particularly sensitive temporal lobes, a condition sometimes brought about through temporal lobe epilepsy or brain injuries, may be more susceptible to changes in GMF activity (e.g., Fuller et al., 1995; Persinger, 2001; Persinger & Koren, 2001, pp. 183 – 184).

These findings were extended to apparitional experiences when neuroscientist Michael Persinger and his colleagues at Laurentian University in Canada reported findings that suggested that the geomagnetic activity tended to be stronger on days in which people reported seeing apparitions of people that had recently died (Persinger, 1988; Persinger & Schaut, 1988). When extended to haunting cases, strong geomagnetic fields (around 200 milliGauss or more above the average for the Earth's GMF) have been found at reputed haunt sites (Roll & Persinger, 2001, pp. 154 – 163), which often seems to be related to either the structure of buildings in, or the geology of the area around the haunt site as noted above (for example, some structures contained materials that could potentially harbor magnetic fields, such as stone or mesh wiring; or were built near fault zones).

In attempting to measure geomagnetic fields, one of the simplest yet least expensive devices that a paranormal enthusiast can use is the Tri-Field Natural EM Meter, manufactured by Alphalab, Inc. [3]. Rather than measuring the strength of the GMF in the local area, the Natural EM Meter measures the *changes* in the local GMF that may result from one or more of the natural phenomena discussed above. This meter gives readings of these changes in units of microTesla, and a useful conversion factor to note for our purposes is that 1 microTesla = 10 milliGauss (Hafemeister, 1996, p. 975). We should note here that since the Natural EM Meter is measuring magnetic changes, it is very sensitive to even the slightest movement of one's hand, and thus the needle can move about erratically and potentially produce a false reading if one is holding it and

walking about during an investigation. One way to reduce this is to place the meter on a stationary surface (such as a table) and let the needle to fall to zero before taking any readings.

Electromagnetism

Electromagnetic fields are AC fields that are most often produced artificially by electrical power currents such as those found in our homes. In some instances, they may also be produced naturally by geophysical sources, such electricity produced through seismic pressure on conductive rock along fault zones (Persinger, 1985, 1987), and very low frequency atmospherics, which are electromagnetic pulses produced from electrical discharges after a lightning strike that average around 0.6 milliGauss (Schienle et al., 1998).

The issue of possible health effects in humans due to electromagnetic field (EMF) exposure has received a great deal of attention over the past several decades (Hafemeister, 1996; Portier & Wolfe, 1998; Zipse, 1993), and this may still be a relevant issue today with the high volume of computers, electronics, and appliances that have been introduced into the home and workplace. Prolonged exposure to the magnetic fields given off by these devices may provide a reason as to why haunt-related experiences are sometimes reported in new and fairly recent buildings, as opposed to the stereotypical old, abandoned, and eerie-looking building that plays host to urban legends. For example, Persinger, Koren, and O'Connor (2001; Persinger & Koren, 2001, pp. 184 – 187) investigated reports of haunt phenomena (including apparitions, sensing a presence and an unseen touch, nightmares, breathing & whispering sounds, and light flashes) in the small home of a young adult couple. The house itself contained a large amount of electronics and appliances, and was described as being “overwired” and not properly grounded.

Concern has also been raised over the effects that electromagnetic field exposure may have on brain functioning and resulting mental health (Paneth, 1993; O'Connor, 1993), and at least some experimental studies have seemingly demonstrated an effect. For example, two studies have observed possible changes in brain wave activity on an electroencephalogram (EEG) following brief (2 sec.) exposure to EMFs as strong as 780 milliGauss and higher (Bell et al., 1992; von Klitzing, 1991), similar to the levels we may find at haunt areas. Persinger, Richards, and Koren (1997) found brain wave changes when lower strength magnetic fields (10 milliGauss) were applied over longer periods of time (several minutes), with these changes even continuing for a short time after the magnetic field has been removed. A review of experimental studies also suggests that changes in brain chemistry and hormone levels may sometimes occur in response to EMF exposure (Reiter, 1993). A considerable amount of evidence suggests that EMF exposure can also affect sleep (Sher, 2000), which might contribute to haunt experiences that occur during sleeping hours. Gangi and Johansson (2000) have even proposed a model which suggests that EMF exposure may cause certain skin cells to release certain inflammatory substances that may cause itching and other skin sensations. If their model is correct, it may perhaps be a way to account for some of the strange skin and touching sensations that people sometimes experience at haunt areas.

The suggestion that electromagnetic field exposure might be tied in some way to apparitional experiences comes from both laboratory studies and field investigations. In the laboratory, Persinger, Tiller, and Koren (2000) were able to study the experiences of a man who had reported haunt phenomena in his home a few years before. When a 10 milliGauss EMF with a complex wave pattern was applied to his brain, the man reported experiencing brief “rushes of fear” and various odd sensations, followed by him seeing a visual image that seemed to resemble

the apparition he saw in his home. Changes in the man's brain wave activity were also observed by EEG in conjunction with his experience. See also Persinger (2001) and Persinger and Koren (2001, pp. 190 – 192) for other discussions of this and a related study.

The electromagnetic fields in most buildings tend to average between 0.2 and 2 milliGauss. However, various field investigations have found EMFs notably above this average at haunt sites (e.g., Persinger et al., 2001; Roll et al., 1996; Roll & Persinger, 2001, pp. 154 – 163; Wiseman et al., 2002). This is not always the case, however; there are at least two field investigations that did not find strong EMFs at the haunt sites when measuring for them (Maher, 2000; Maher & Hansen, 1997).

To measure electromagnetic fields, one of the least expensive yet effective devices that a paranormal enthusiast may commonly use is a second type of meter made by Alphalab, the Tri-Field Broadband Meter [4]. This meter is calibrated to measure EMFs such as those generated by power lines, and gives readings in units of milliGauss. When taking readings with this meter, it is important to note any possible sources around the meter (e.g., electronics and appliances, power generators, running cars, & electrical wiring) that may naturally cause the meter's needle to move higher or even spike, and which may lead to a false reading.

Comments & Tips on Magnetic Fields at Haunt Areas

We now present some additional comments, as well as some useful tips for paranormal enthusiasts, on the measurement of magnetic fields – both geomagnetic and electromagnetic – at haunt areas during field investigations.

1.) Always take note of the area around the spot you are measuring to make sure that there are no electronics, appliances, power lines or generators, and wiring nearby that may be a natural cause for any magnetic fields you detect. This will be better ensure that you may be getting an anomalous reading, and not a false one. It is vitally important to recognize that although it appears that magnetic fields may be tied in some way to apparitions and haunting phenomena, *this does not necessarily mean that the presence of fields at haunt areas are due to ghosts*. Many less-experienced investigators have immediately jumped to this conclusion, and one can see that it is generally not correct when one realizes that there are many sources in non-haunted locations that can generate these fields by conventional means. These same sources may also be found at haunt sites.

2.) Be sure to take baseline readings of the haunt site to determine the average magnetic field strength of the site. It can be helpful to compare readings taken from haunt areas where ghostly phenomena has been reported with reading taken from nearby areas where no phenomena has been reported (“control” areas). It is useful to establish a baseline magnetic reading that can be compared to the magnetic field readings at the haunt area, which may help determine just how different the two are from each other (a basic indication of how “anomalous” the magnetic fields in the haunt area are). Measurements should first be recorded throughout the haunt site to determine the average magnetic field strength of the site, as well as locate any areas where there might be natural irregularities in the field due to power generators, power lines entering the building, and/or a large amount of electronics, appliances, or electrical wiring gathered in one room. This practice will also help in accomplishing the goal in Tip #1. Houran and Brugger (2000) have suggested that measurements at haunt areas should also be

compared to those taken in a “control” area where no haunting phenomena have been reported. This can help to establish that the measurements from haunt areas are anomalous, and not just part of the regular background fields of the area. As noted above, there are several conventional sources at non-haunt sites that may produce large magnetic fields from time-to-time, and some of these same sources may also be found in haunt sites. If the measurements from the haunt area and the control area are close to each other in strength when they are compared, then this may hint at these conventional sources being involved, and the readings at the haunt area not being particularly anomalous.

3.) Investigators may want to try to detect changes in the magnetic field over time by taking repeated measurements in different areas of a room, and/or different areas of the haunt site to see if there is any potential sign of a gradual increase or decrease across the haunt site. A number of field investigations reported in the parapsychological literature are beginning to indicate that it is not the absolute strength or intensity of the magnetic field at the haunt site that may be important, but rather the way that the field changes over time. In at least two of the haunts investigated by noted parapsychologist William Roll (reported in Roll & Persinger, pp. 156 – 157), the strength of the magnetic fields were noted to either be gradually increasing or decreasing as one moved from one side of the haunt site to the other, suggesting that the field was changing throughout the site. In the course of investigating haunt reports at historic Hampton Court Palace in England, Wiseman et al. (2002, 2003) noted in a statistical comparison that the magnetic field changes in areas of the palace where haunting phenomena had been reported were significantly different from the field changes in areas where no phenomena were reported. They also found in another statistical comparison that the number of unusual experiences reported by tourists visiting the Palace was also related in some way to the magnetic field changes at the site. Braithwaite and associates have taken several measurements in a specific bedroom at historic Muncaster Castle in England (Braithwaite, 2004; Braithwaite et al., 2004). People sleeping in the bed found in that bedroom have reported hearing voices at night that sound like children crying, and measurements were taken in the area around the pillow of the bed and later compared to control measurements taken towards the center of the room, where the voices apparently came from. Notable changes in magnetic field strength were noted over this very short distance (roughly a few meters), suggesting sharp magnetic field changes across the space of a single room. Most recently, Terhune et al. (2007) found suggestive differences when statistically comparing the magnetic field changes in areas where haunt phenomena were reported to control areas where no phenomena occurred. Similarly, the magnetic fields applied to the brain that Persinger and his associates use to simulate haunt-related experiences (Persinger, 2001; Persinger & Koren, 2001; Persinger et al., 2000) are often composed of complex patterns that can change the structure of the fields.

4.) Carefully log all magnetic readings and conditions, including specific locations where readings were taken, time that readings were taken, and the length of time that the magnetic field was present. If floor plans of the site(s) under investigation are available, use copies of these to record your readings. Otherwise, it might be beneficial to draft your own floor plan of the site(s), time and resources permitting. If one hopes to have their results taken seriously, it is often better to have a complete record or log of the investigation, particularly of all measurements made. Human memory alone is too unreliable because it is subject to bias and error. Having a record may also help to reveal possible patterns in the activity at the haunt site

that may hint at a possible natural source for it (e.g., some EMFs in homes and buildings may sometimes change at regular intervals when certain equipment or appliances, such as air conditioners, refrigerators, etc., turn on and off).

Although it is not meant to be comprehensive, we hope that this primer provides a starting basis for those paranormal enthusiasts who wish to take their approach to haunting investigations a step further.

Notes

[1] To get a bit technical, this would follow from Ampere's law (with Maxwell's correction), one of Maxwell's laws that relates electricity to magnetism; see, e.g., Griffiths (1999, p. 323).

[2] Magnetic fields are usually measured in one of three main scaled units: Gauss, Tesla, and Gamma. Since many commercial magnetometers often used by paranormal enthusiasts, such as the Broadband Tri-Field Meter made by Alphaslab, Inc. (see also Note #3), tend to give magnetic field readings in terms of milliGauss (i.e., one-one thousandth of a Gauss), we will use this unit as our reference point throughout this primer.

[3] The Tri-Field Natural EM Meter is similar in appearance to the Tri-Field Broadband Meter (also made by Alphaslab), which paranormal enthusiasts also commonly use in investigations, but is recognized by its blue-colored label surrounding the dial switch, and by the small knob on the side of the meter. Both types of meters can be purchased from Alphaslab (<http://www.trifield.com>).

[4] The Tri-Field Broadband Meter is distinguished from the Tri-Field Natural EM Meter by its tan-colored label surrounding the dial switch, and lack of small knob.

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