

Electromagnetism and Paranormal Phenomenon

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Disclaimer: This paper is intended to be a scientific outlook on why electromagnetic fields might be a factor in paranormal phenomenon. The views and concepts expressed in here are solely that of the author unless otherwise stated.

INTRODUCTION TO ELECTROMAGNETISM

Electromagnetism is, to most, the foundation for all paranormal research in the scientific world. Paranormal activity is believed to stem from fluctuations in natural energy that is constantly around us. Electromagnetism is a key ingredient to this and is essential to understand when researching paranormal phenomena. In order to begin, the core concept of what electromagnetism must be discovered. Separating this word into two comes up with “Electricity” and “Magnetism”. Thus, we know that electromagnetism has a relationship with these two forces. But how and why do these forces interact with each other?

Electricity is the first component of electromagnetism. Electricity is a flow of electric particles that travel along a medium. The particles are subatomic particles (electrons, protons, neutrons) and this interacts with a medium that can “conduct” or create a flow from start to end of these particles. Natural elements such as copper are a natural conductor because of their ability to transmit this flow in the highest yield. Other mediums of transmission can be that of a static field, which is how lightning is able to transfer from point to point.

Magnetism is the second component of electromagnetism. Magnetism creates an attractive and repulsive force on materials. Some materials respond better to the forces than others. For example, nickel and iron respond far better to these forces due to their properties than an element such as hydrogen. However, for all intensive purposes, it can be thought that ALL materials interact with magnetic fields, just in different capacities.

Both these basic definitions of electricity and magnetism are incomplete without brining in the concept of electromagnetism, which links these two forces together into what is known as a primary natural force in our world. Electromagnetism creates a magnetic field force that exerts a force on particles that contain an electric charge. Each particle is affected by each others forces as they interact with each other within the field. Electric fields and magnetic fields are completely proportional to each other. In other words, an electric field that is changing will affect the magnetic field and vice versa. Both fields cannot exist without the other playing a role in the balance of itself. The following shows a basic electromagnetic field whereby both electricity and magnetism are playing a role with each other:

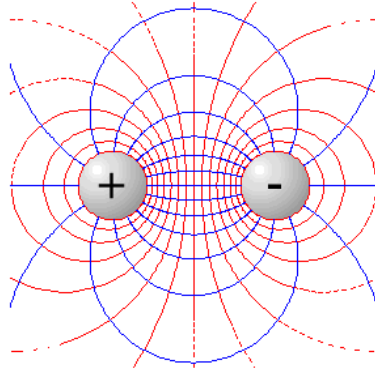


Figure 1 – Positive and Negative electrons create a constant attraction and repulsion for and against each other, creating an electric field.

(<http://www.sm.luth.se/~urban/master/Theory/1.html>)

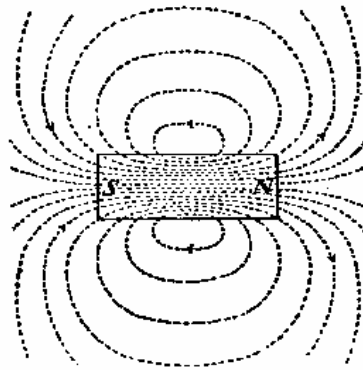


Figure 2 – North and South poles of a magnet create attraction and repulsions forces, creating a magnetic field.

(<http://www.lcc.ukf.net/clipart.htm>)

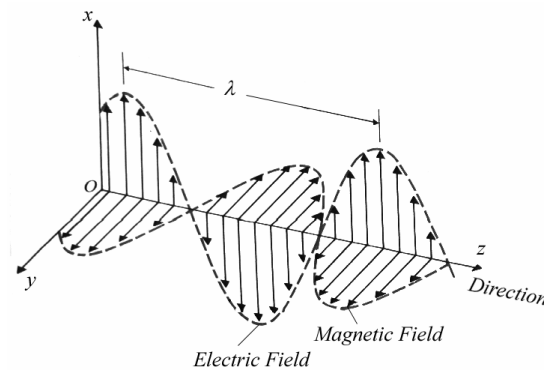


Figure 3 – Combines both the electric field and magnetic fields to create a single electromagnetic field

(<http://www.sm.luth.se/~urban/master/Theory/1.html>)

As one can see, both electric and magnetic forces create an extremely similar field in their properties. With such identical fields, their forces naturally interact with each other. Ever-changing electric fields will affect magnetic fields and ever-changing magnetic fields will affect electric fields. Figure 3 shows how a moving electric and magnetic fields creates the combined electromagnetic field in a single direction. Electromagnetic fields can be determined by four variables

- the magnetic flux density **B** with the unit T (Tesla or volt-second per square meter)
- the magnetic field intensity **H** with the unit A/m (Ampere per meter)
- the electric field intensity **E** with the unit V/m (Volt per meter)
- the electric flux density **D** with the unit C/m² (Coulomb per square meter)

<http://www.sm.luth.se/~urban/master/Theory/1.html>

As discussed by master students Joachim Johansson and Urban Lundgren “A *time-varying E and D will give rise to B and H, and vice versa where the relation depends on the properties of the medium. Far enough from the source the magnetic field, H, will be perpendicular to the electric field, E, and both are normal to the direction of propagation, as shown in the following figure.*” In other words, this is a mathematical model that dictates what was stated before between the relationship of electricity and magnetism. Electricity intensity and density depends on the Magnetism intensity and density.

In order to further close the gap between electricity and magnetism, it would take a brilliant scientist by the name of Michael Faraday to work on the relationship between these forces and mathematically prove them. Born in London on September 22, 1791, Faraday was a self-educated scientist that had a great interest in electromagnetism. It can be thought of that Faraday was the father of modern day electromagnetism study.



Figure 4 – Michael Faraday

His first claim to fame occurred when he began studying the effects a magnetic field around an electric conductor. Believing that the two acted on each other, he realized that when one field was

activated the other field would react, and vice versa. Based on this principle, Faraday found his famous equation for electromagnetic field interaction called “Faraday’s Law of Induction”. The mathematical formula is as follows:

$$\mathcal{E} = -\frac{d\Phi_B}{dt}$$

Figure 5 – Law of Induction

From this equation we know that Sigma is the electromotive force (EMF) in volts while Phi-Beta is the magnetic flux through the circuit. To put it more simply, his law states that, “*The induced electromotive force in any closed circuit is equal to the time rate of change of the magnetic flux through the circuit.*” http://en.wikipedia.org/wiki/Electromagnetic_induction. This formula mathematically showed that magnetism fields and electric fields could in fact interact with each other in a similar direction! Further experiments further proved this theory, such as when he had two insulated coils and passed a current between one. By doing this, the second coil nearby also had a brief charge, due to the electromagnetic field that was generated by the first coil. This led to the add-on theory of “Mutual Induction”. Going even further Faraday took this law to apply to light. Faraday found that by using a magnet, he could take polarized light and literally rotate the light in the direction of the magnetic field. This was called “Faraday’s Effect”. Other devices and effects came from Faraday, which all stemmed from his basic Law of Induction principle. It can be considered that Faraday and electromagnetism is to Einstein and Newton as they are to energy and gravity.

ELECTROMAGNETISM IN THE WORLD

So, with the basic concepts and history of electromagnetism discovered, the real-world uses of electromagnetism can be discovered. Electromagnetism is all around us. In fact, electro-magnetic fields, or EMF, is present in just about any device that gives off electric signals. As we know from our definitions previously, if electric signals are being transmitted in a direction, then magnetic fields are also being transmitted. The largest example is in fact, Earth. Earth can be thought of as one gigantic EMF source due to its rotating feature. As the planet rotates, it generates a magnetic field. While scientists are debating why exactly this occurs, it is most commonly believed due to Earth’s metallic core of that of Iron and

Nickel. In fact, most of the core is made of these materials, both in solid and liquid forms. As the Earth rotates, both the Iron and Nickel is rotating as well.

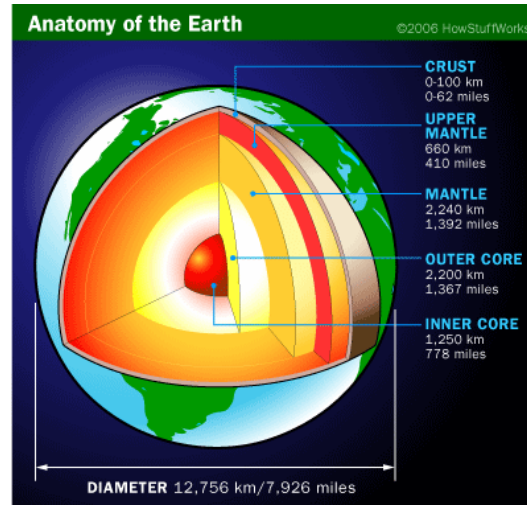


Figure 6 – Earth’s interior
(outer and inner cores are nickel and iron, mantle and crust is mostly silicate)
<http://static.howstuffworks.com/gif/compass-core.gif>

As we saw from our model examples by Faraday, as a metallic surface is rotating, it generates a field around it. The power source for this rotation is none other than gravity itself. As Earth pulls on the Sun (and vice versa), it generates a gravitational spin. This spin is what drives the Earth to rotate and is what makes the core itself rotate.

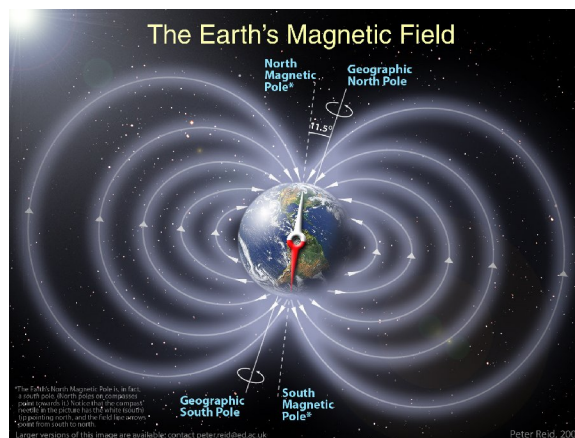


Figure 7 – Earth’s Magnetic Field
<http://www.scifun.ed.ac.uk/card/images/left/earth-magfield.jpg>

If you recall the previous figure's showing an electric and magnetic field, you will notice that they are extremely similar in depiction to that of Earth's field. As this field is produced, it creates a natural barrier to harmful rays from the Sun that would otherwise completely cook our planet. As found in planets that do not have a magnetic field, such as Mars today, the entire planet is bombarded with solar radiation that turns the landscape into a radioactive desert.

It is important to realize that Earth always has an electromagnetic field because we are constantly drowning in it. When you walk to your car, sitting at your desk, or jogging in the park, the EMF is always around you. However, the field is so minute that it will hardly reach that of 0.1 milligauss, and be more so between 0.01 to 0.09. This value is so minor that it hardly affects instruments. However, other devices that are currently present in our world can dramatically affect this value.

Some examples of devices that generate strong EMF are microwaves, televisions, computers, unshielded wires, power boxes, etc. Devices such as televisions and computers give off an EMF field due to their electric field fluctuations, which in turn generate magnetic fields and create the EMF. Typical readings can be anywhere from 8mg to 25mgauss. Microwaves give off an even higher field due to a combination of electric and magnetic fields being generated within. Typical readings can be anywhere from 20mg to 50+mgauss. Unshielded wires and power boxes are the types of devices that can give off the greatest EMF readings that play the largest role in paranormal research.

EMF AND NATURAL PHENOMENON

Now we get to the heart of this topic. While we have discussed the history, functions, and types of EMF's that we can experience, we can now begin to correlate how EMF and paranormal research plays an integral part together. To begin, we first will discuss how natural EMF can cause a mis-leading paranormal experience and then discuss how natural EMF can create an authentic paranormal experience.

Unshielded electrical and power wires often run between floorboards and walls within many homes, especially those older homes. These wires having a non-lead or other type of shielding around them can actually "leak" out EMF that can extend well into rooms and areas within a home. At the core of the wire an EMF reading can read up to 20mgauss. If the wire extends within the floorboards and crosses into a room, then the center of the room or near the floor can reach EMF readings between 3mgauss all the way to 10mgauss. So why is this a problem?

Quite simply, EMF's are a hazard to your health. While the public health board has no official statement on EMF exposure, it is generally known that being in any one area with high EMF's can create undesirable side effects. Some of these can include, but are not limited to; nausea, headaches, spider-like sensations, paranoia, dizziness, and even cancerous related illnesses. In order to attain the worst of these side effects, one would have to be exposed to nearly 12 or more hours to a field of 50mgauass or higher. This is generally not the case for homeowners, but may be the case for those working too near power-boxes or lines. However, readings that extend beyond 0.6mgauass are considered beyond normal for most researchers, and should be noted. Those that extend beyond 1.0 should be considered a hazard for anyone spending more than 2-4 hours in the area.

When doing a "EMF Sweep" of an area, it is important to realize all of these facts. If a client is feeling uneasy about a certain area, if there is a base EMF reading of around 2, and it is in an area where they spend a lot of time in, this correlation can be made between the natural EMF side effects and the feelings of the client. If a high EMF field is detected, it is highly recommended that the client call an electrician to either re-route the disturbance of the field to a new part of the building or to cover up the unshielded wires with a lead or other type material that absorbs or negates the high electro-magnetic discharge.

Beyond unshielded wires, power boxes can also give off extreme high emf readings, some can even extend beyond 200 milligauass. If you have a combination of unshielded wires and multiple power boxes in an area, this will create a 360 degree high emf reading in an area. This is what many paranormal investigators call a "Fear Cage". The cage term comes from the circular area that encompasses the area with the high emf and the fear term comes from the side effects that can be produced. It is extremely unhealthy to have a prolonged exposure to fear cages, but detecting one can be incredibly useful to debunking an uneasy feeling in an area.

EMF AND PARANORMAL PHENOMENON

While EMF can attribute for dozens of natural cases, there is a small percentage that can account for unknown or paranormal phenomenon. We know from Faraday and from our studies on the natural effects of electro-magnetic fields that a source must be present when creating the electric or magnetic field. Sources can be a device such as a microwave or computer, they can be natural such as the entire Earth itself

or limestone (discussed later on). However, it has been documented that unknown generations of EMF are created in areas where they should not be there. For example, if a base EMF reading is at around 0.5 milligauus and it jumps suddenly to above 2.0 milligauus, this can account for a paranormal activity; as long as no plausible source of the increased reading can be found, of course. EMF readings that seem to rise on their own or occur in free-floating spherical areas are a mystery to science as of now. There is no reason why an electromagnetic field should be increasing in density from no apparent source. It is unknown why this occurs, but some scientists theorize it can be due to solar radiation that sometimes gets through our atmosphere's barrier, which can tamper with devices by creating brief but powerful EMF's. Others suggest that multiple devices that create local EMF's can create a Faraday effect called "Mutual Induction", which we know means that one localized EMF can create a new EMF.

However, even with these suggestions, there has been documented studies that unknown paranormal events such as object manipulation and manifestation can occur when high EMF fluctuations occurs. Regardless of why they occur, this correlation between high EMF and paranormal phenomena is one that is too hard to deny. Some paranormal scientists have concluded that "ghosts" can draw upon these fields to make use of them, which is in turn what gives them the ability to make objects move.

ENERGY FORMS AND EMF

While this paper does not discuss the theories behind how a "ghost" is created or why paranormal phenomena occurs, the correlation between a paranormal event and EMF is vitally important to the overall discussion of EMF. As stated before, when a researcher discovers a temporarily brief surge in EMF from an unknown source, paranormal events such as an object moving, an EVP recorded (not discussed here), or other such event occurs quite often. A full-scale statistics chart could show a correlation variable here, but currently, Syracuse Paranormal does not have enough data to make such a chart.

So the question becomes, why does paranormal events occur when the EMF reading increases? A corollary to that would be, does a natural high EMF reading give rise or deter paranormal events? To answer the first question, a brief explanation of energy itself is explained. Energy is, by most definitions, a quantity of activity that allows one system the ability to accomplish work (which in scientific terms allows it to perform an action). Many different forms of energy exist, including but not limited to, gravitational, sound, light, kinetic, potential, thermal, chemical, mass, and of course; electromagnetic. Energy may be

transferred between these types freely. The ability to do this is differs in function. For example, transferring potential energy to kinetic energy is a simple matter of releasing whatever stored energy a system has. More complicated ways to transfer energy exist in transferring mass to nuclear energy, in a thermonuclear reactor. However, the core concept here is to know that energy CAN be transferred between different forms. The drawback and most importance function in this ability is the fact that energy can NEVER be created or destroyed.

The conservation of energy law states that if you transfer energy from one form to another, no loss in that total energy occurs. You also cannot produce energy where there was no energy to begin with. Thus, when we discuss paranormal activity has having an “entity” producing some sort of “energy”, we are not discussing mythical things. Energy in paranormal phenomenon is the same energy we discuss in light and sound and other natural areas. The only difference is we do not know what type of energy is being used and how it was transferred. More important, we still do not know the method of how this energy is transferred. Are natural EMF areas allowing sound and light to interchange? Can physical manipulation in high EMF areas be attributed to kinetic energy being transferred from electromagnetic energy? Do “ghosts” draw upon the EMF to allow them to convert the energy to audio or visual evidence? These are questions that are well beyond the scope of this simple paper, but are the underlying foundations for paranormal science.

CONCLUSIONS

As we have discussed in this short, but informative, paper, is that electromagnetic fields are a relatively new study in the scientific community that have close relationships to paranormal phenomena. The future study of how EMF relates to the transfer of energy and how it interacts with our everyday life will become vital to the understanding of paranormal phenomena. If we can actively prove that an EMF area can in fact produce unknown other forms of energy, then we can effectively prove the existence of new forms of phenomena that were otherwise deemed as “paranormal”. Truthfully, the overall goal for any paranormal researcher is to move away from the “para” and move closer to the “norm”. With our current understanding of energy with the help of scientists like Faraday and Einstein, we are moving one step closer to understanding its nature. As more and more paranormal researchers are jumping on the bandwagon of correlating EMF with paranormal phenomena, then new statistical data can be referred back

to the new studies of EMF to create a plausible theory on their connection. For now, the long and arduous process of compiling data must occur between paranormal researchers world-wide until the scientific community at large begins to focus their attention on the unknown phenomena known as paranormal science.