

Paranormal Ghost Investigation- Is its Foundation Scientific

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ABSTRACT

We come across Paranormal Ghost investigators using scientific gadgets to communicate with spirits at haunted places. They work on many assumptions viz. ghosts emit Electromagnetic fields and respond to EMF meters, they draw energy from the environment for their manifestation which creates cold spots which not only get noticed on special thermometers but also lead to their leaving thermal signatures captured as their pictures on thermal cameras. They also believe that we can't see them but can capture their images on special night cameras. There are many more assumptions about ghost capabilities which form the foundation for their investigation. This paper explores these assumptions and examines whether the assumptions are scientific. The aim of the paper is not to discredit the valuable work being done by the Paranormal Investigators nor does it attempt to answer the question- Do Ghosts Exist? The author being a parapsychological researcher believes that worldwide apparitions are seen and after death communications with discarnate spirits do happen. Parapsychologists are doing causal research to find scientific reasons behind these phenomena and one day science will advance and provide us with answers.

Keywords: *Paranormal Investigation, Ghosts and Spirits, Haunted Places and their cleansing processes, foundation of the ghost investigation process, Apparitions, Science behind ghost hunting*

Worldwide, we have sporadic and spontaneous instances where people get messages from their deceased near-dear ones. Not only do they hear from them, but they also often see them in person. Such events have been happening since time immemorial and are beyond the understanding of science. Some sceptics call these hallucinations and figments of imagination. Some rationalists do not deny this perception of discarnate entities but they say that Pareidolia (a mental phenomenon) may be behind this which creates this perception by creating familiar images from complex patterns which come before it. *Pareidolia is a topic not known to the common man. It is a weird topic which reveals how the brain can fool us. We might have been deceived by looking at clouds and observing a face staring at us or could figure out an image from the water spilt on the floor. The brain tries to make meaningful perceptions even when there are none.*

I narrate my personal experience:

My father died at the age of 92. He was fighting a deadly bacteria which according to doctors is lethal and the end came. A Doctor came out of the ICU and announced his demise. He

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expired a moment ago; I went in paid respects to him and came out of the ICU to inform my brother that Dad was no more. My mind was playing a flashback with memories of the past which had mom and dad. As I came out of the ICU and looked at the relatives sitting on a bench in front of the ICU, I was dumbstruck to see my mother in the row of relatives. At that very moment, my brother came up the stairs and I told my brother about the death of dad and told him to look at Ma sitting on the bench. He also exclaimed that Ma had come to accompany Dad to the new world. We both were dumbstruck to see our mother there because she had died thirty years back.

Later my sisters came after hearing the sad news and soon the whole family was in tears. But my sisters did not exclaim that they saw Ma in the row of guests. It surprised me and my brother.

I, then, thought that there was some truth in the existence of spirits and ghosts as I had above first-hand experience.

*Later when I researched, I found that it could be that **Pareidolia** had taken over the minds of me and brother and our brains had tricked us by generating a wrong perception by morphing our mother's face into a lady's face and we felt we had seen our mother. My sisters did not see Ma because they were not told about the experience that I and brother had and they just looked there and saw some old lady sitting on the bench.*

Had I not researched I would be telling everyone that I had seen the ghost of my mother!!! Or was there no pareidolia but she really appeared as a ghost and had disappeared after escorting my father with her to heaven before my sisters came on the scene!!! I do not know.

Despite the above experience, I keep my fingers crossed and do not disbelieve that ghosts exist. Maybe my mother's ghost had left before my sisters had arrived and it was really the spirit of my mother that I and my brother saw. Every time, everyone in the world may not be having Pareidolia when they see their deceased relatives. Maybe the spirits do really manifest!!

Some paranormal investigators believe that ghosts exist. They interact with them using scientific tools. Upon receiving requests from persons distressed by poltergeist harassment, they reach the haunted places and try to assess the presence of ghosts. If found, they try to communicate with them using scientific instruments. Most often they are successful in ridding the haunted places from the ghosts, thereby, helping the distressed people. They do a great service to society!!

In this paper we do not contest the existence of ghosts, we limit ourselves to examining whether the foundations on which paranormal investigations rest are really scientific. Do they proceed in the investigation process on scientific grounds?

Before we explore the foundations on which paranormal ghost investigations are based, let us first understand the process of Paranormal Ghost Investigation using scientific gadgets.

Paranormal Ghost Investigation Process (using scientific gadgets.)

I, being a Parapsychological Researcher, have curiosity to learn about investigations into life after death and communication with spirits is one such area that arouses my curiosity. The

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process of paranormal investigation was outlined in my paper published in the International Journal of Social Impact¹ and is presented below:

Even though I do not have any first-hand experience with Paranormal Investigation but as per details available in the literature and my logical thinking; the following must be the sequence of activities in the process of Paranormal Investigation:

- Locating the haunted places, either through contacts with owners or learning through media.
- The owners of the haunted place call these investigators. For locations learnt through the media, the investigators seek permission for investigation from the respective authorities.
- Reaching the place, they gather the past history of the place, do a preliminary investigation and carry out a survey of the place to learn what ghostly activities are observed. Then they take action so that their gadgets can be used without any bias. For example, they remove all known sources like electrical wires etc. which may generate electromagnetic radiation and may interfere with the EMF meter which is used to detect ghostly presence.
- Conducting the investigation-----In the words of Mr Gaurav Tiwari (considered the father of the Paranormal Investigation Movement in India; now deceased): When we receive a complaint, we analyse the incident at the client's place using various aspects of science like electromagnetic fields, geomagnetic impact, temperature and humidity. We note all the reasons that could trigger hallucinations. If we feel there's no natural or environmental reason which could make our gadgets respond i.e. we have eliminated all possible reasons and the only reason left is the presence of ghosts, we begin our vigil, trying to communicate with the spirit. If we find any activity that can't be replicated in a lab or be explained scientifically, we call it paranormal. We try to establish contact using our gadgets. We record everything with gadgets that prove the existence of paranormal forces." -" says Tiwari.
(source: <https://timesofindia.indiatimes.com/city/gurgaon/gadgets-gyaan-to-grabghosts-in-gurgaon/articleshow/14569669.cms>)
- Once the gadgets show the presence of ghosts/ spirits, paranormal investigators try to talk to the ghosts/spirits by asking questions which could be answered as yes or no. They suggest the ghost attempt to flicker the K2 meter one time if the answer is yes and two times if the answer is no. They try to understand through the conversation the reason why ghosts are present here and why they are causing trouble. They try to understand what they want and then they try to make them understand that they are now not in this world and they must walk over to their world. Many a time the ghosts leave the place.
- Use is made of all gadgets to record paranormal activity, thermal camera captures photographs, EVP records voices and noise etc. and all data is collected.
- Data is subsequently analyzed by piecing together the information collected on different gadgets and then arriving at meaningful conclusions using all information. The analysis results in a report prepared on the findings and shared with clients if the assignment was for a client.
- The last operation in the process is cleansing i.e., taking action to make the place free from ghosts/spirits if the ghost does not leave the place after communicating with the investigators.

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These appear to be the logical steps in the process of Paranormal Investigation.

I am greatly influenced by the book-"The Spirits talk to me" by Sarbajeet Mohanty and Neil D' Silva. I explored the work done by IPS (Indian Paranormal Society), P.A.I.R.S (Parapsychology and Investigations Research Society), ISPS (Indian Specter Paranormal Society), and CPSR (Council for Paranormal and Spiritual Research). Also, I had an occasion to interact with some prominent paranormal investigators and learn from them details about Paranormal Ghost Investigation.

I have read accounts of several paranormal expeditions of credible paranormal investigators in literature and have also seen videos explaining their achievements. I have read the book, and I have also listened to credible podcasts where the paranormal investigators have explained how they carry out paranormal investigations to locate ghosts, communicate with them, understand why the ghosts are carrying out poltergeist activities at the haunted places and finally they carry out cleansing activities to rid the places from ghosts.

All these fascinated me and I am sold on the idea that paranormal investigators are doing credible work and are rendering credible service to mankind.

I am impressed by the work done by Paranormal Investigators. They have done a great service to society by alleviating the suffering of the sufferers of Poltergeist activities while carrying out Paranormal Investigations and are still pursuing their great work!!

The paranormal investigations need further research. I am moving further in this pursuit: Examining the paranormal ghost investigation further, some commonly used terms in paranormal investigations are:

Apparitions- Visual representation of a disembodied entity or spirit. This might take the full form of a person, or appear as a faint mist. *The assumption is that the ghosts manifest as apparitions.*



(Picture of an apparition)

Cold Spot- Cool or cold patches of air. Ghosts draw energy from the air, which leaves the cold spot behind ---- *this is one foundation on which paranormal investigation rests—we shall explore it later.*

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DVP—Direct Voice Phenomenon—audio that is heard live rather than on a recording. Direct Voice Phenomena or DVP are audible, disembodied voices that are heard during ghost seances. The medium can encourage and give the spirit the energy to come forward and communicate, but the voice doesn't come from the medium but it is heard coming from mid-air in front of them or elsewhere in the room, and the words were spoken in the spirit's own voice. (Source: <https://www.higgyop.com/news/direct-voice-phenomenon/>)

Dowsing—Movement of rods or pendulums to communicate with spirits



(Picture of dowsing)

The L-shaped rod is probably the most ancient of all dowsing instruments. The word “Dowsing” means to use a rod or pendulum to find something. Experiments and research in dowsing have led people to believe that the dowser responds to *electromagnetic fields given off by the ghosts*. Paranormal Investigators feel that dowsing works so well with the EMF meter.

Another foundation on which paranormal investigation rests is that *Ghosts emit electromagnetic fields*.

Ectoplasm- Mist associated with Paranormal Ghost activity

Ectoplasm is a mysterious substance that is said to be involved in the materialization of spirits and the levitation of objects. It is often described as a light-coloured, viscous substance that can appear as a gauze, plastic paste, or bundle of threads. Ectoplasm is said to be most visible in the dark atmosphere of a séance.



(picture of Ectoplasm)

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Another foundation on which paranormal investigation rests is that Ectoplasm, a static form of energy, is emitted by spirits or ghosts which can be photographed. Ectoplasm is an energy that Ghosts; and spirits use to aid in their manifestations.

EMF- Electromagnetic Frequency (or field) –the combination of electric and magnetic energy which is generally experienced in the presence of spirits.

One of the foundations on which the paranormal rests is the thinking that Ghosts emit electromagnetic frequencies of varying intensities which can be detected using EMF gauges or meters. Ghosts answer questions by responding with varying EMF intensities which make the EMF meter flicker once/ twice or three times to answer specifically to the questions put to them. This also assumes that Ghosts can understand our questions.

EMF Meters or K2 Meters-In EMF meters the Five bright coloured LEDs will illuminate to indicate the strength of the Electromagnetic field in the area. It is very easy to see in low light conditions instantaneous response of EMF fluctuations & spikes of Electromagnetic fields, emitted by electrical devices of all types. EMFs are everywhere, originating from appliances, cell phones, electrical wiring, and even the human body.

The K-II EMF Meter helps measure these fields to identify appliances that produce high-level emissions, allowing users to make informed decisions about limiting exposure. EMF fluctuations have also been associated with locations where unexplained phenomena have been reported, including alleged hauntings.



Picture showing **K2/EMF meter** (source: <https://www.amazon.in/Magnetic-Detector-Hunting-Paranormal-Equipment/dp/B07LBK9RH6>)

Ghosts can emit EMF of varying frequencies at their will and they respond to questions by making the EMF meter flicker once/ twice or three times to specifically answer the questions.

EVP (Electronic Voice Phenomenon)--- Audio that is heard on a recording's playback that wasn't audible in real-time. EVP recorders record the voices or footsteps made by ghosts that are not audible to human ears.

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Picture showing *EVP recorder used in Paranormal Investigation*

Another aspect of the foundation on which paranormal investigation rests --that ghosts have capability of producing voices, footsteps and noises which are not audible to human ears but can be picked up by sensitive EVPs.

Within ghost hunting and Paranormal Investigation, Electronic Voice Phenomena (EVP) are sounds found on electronic recordings that are interpreted as spirit voices that have been either unintentionally recorded or intentionally requested and recorded. They are sounds found on electronic and analogue recordings ranging from knocking sounds, footsteps, and garbled noises or growls to distinct voices. They are usually only perceivable once a recording is played backwards.

Ghost lights and Orbs ghost lights—These are lights (or fires) that appear in the atmosphere without an obvious cause. According to legend, some lights are wandering spirits of the dead. These lights are not captured on ordinary cameras but can be captured by Night vision cameras. Night vision cameras are used on the assumption that the movement of ghosts which is not visible in ordinary light could be visible to night vision cameras.



Picture of night vision camera

(Source (<https://www.etsy.com/listing/1363887242/ghost-hunting-night-vision-camera>))

Furthermore, ghost hunting works on the belief that *it's difficult for ghosts to appear as apparitions. It takes a lot of energy for them to do that, because of the difference in vibrational frequency between this dimension and the dimension we call "the other side". Appearing as an orb of light is a lot easier for them and this light orb is not caught on a normal camera.*

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Thermography Camera- It is used with the *assumption that the ghosts can fluctuate temperatures of environments; spirits take energy from surroundings and this can lead to a drop or rise in immediate conditions which will be caught by the Thermography Cameras. It is a device that creates an image using infrared (IR) radiation,*



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Picture showing Thermography Camera

(source: <https://www.shutterstock.com/search/thermography>)

A school of thought believes that thermal cameras work based on the principle of thermography, which is the science of using heat to create images. Every object emits a certain amount of heat, even those that appear to be at room temperature. This heat is in the form of infrared radiation, which is invisible to the human eye. A thermal camera uses a special sensor called a microbolometer to detect this infrared radiation and convert it into an image.

The image produced by a thermal camera is called a thermogram, and it represents the temperature distribution of the objects in the scene. Warmer objects appear brighter, while cooler objects appear darker. This ability to visualise temperature variations makes thermal cameras useful for ghost hunters, as they can detect anomalies that may indicate the presence of paranormal activity. These cameras are used for capturing and recording faint body heat signatures given off by ghosts and spirits.

This leads to *another foundation on which Ghost investigations depend: the belief that ghosts emit faint body heat signatures that are not visible but can register on a thermography camera.*

Night Vision Goggles- These are used on the assumption that the ghosts can fluctuate heat transmissions and thermal imaging goggles can catch these variations and enable them to become visible. Alternatively, image enhancement could make them visible to night vision goggles and they could then mark their presence and communicate with them using other devices.

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Picture showing Night Vision Goggle

We end this section related to terms associated with paranormal ghost hunting with Digital Ghost Hunting Thermometers.

Digital Ghost Hunting Thermometers help aspiring ghost hunters detect "cold spots," which are often attributed to areas of paranormal activity.



The picture shows IR digital Thermometers used by Paranormal Investigators (source:<https://paranormalmusings.com/ghost-hunting-thermometers-the-types-ofthermometers/>)

The theory is that when a ghost attempts to manifest itself, it'll draw energy from the air around it, leaving behind a small pocket of cold air.

Paranormal Investigators use an IR thermometer to measure abnormal cold spikes in certain areas where the surrounding air is otherwise warm.

(source:<https://techcrunch.com/2008/10/31/must-have-gadgets-for-any-aspiring-ghosthunter/>)

Having understood the process of Paranormal Ghost hunting and the terms used in this process, we shall now explore the foundations on which the process is based and shall examine whether these foundations have some scientific roots.

The Paranormal Ghost Hunting rests on some assumptions which can be considered as the foundation on which the structure of Ghost Hunting rests.

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In the above discussions, incidental to the explanation of terms, several assumptions have sprung up which are the basis on which the whole process of paranormal ghost investigation rests.

Extracting those assumptions from the above paragraphs, we can say that the process of Paranormal Investigations rests on the following founding assumptions:

- *For manifestation, the ghosts draw energy from the air, which leaves the cold spot behind. The location of cold spots confirms that the place is haunted.*
- *Ghosts emit electromagnetic frequencies of varying intensities which can be detected using EMF gauges or meters. Ghosts answer questions by responding with varying EMF intensities which make the EMF meter flicker once/ twice or three times to answer specifically to the questions put to them. This also assumes that Ghosts are intelligent entities that can understand our questions.*
- *Ectoplasm, a static form of energy, is emitted by spirits or ghosts to aid their manifestation as apparitions.*
- *It is difficult for ghosts to appear as apparitions. It takes a lot of energy for them to do that, because of the difference in vibrational frequency between this dimension and the dimension we call “the other side”. Appearing as an orb of light is a lot easier for them and this light orb is not caught on a normal camera.*
- *Ghosts have the capability of producing voices, footsteps and noises which are not audible to human ears but can be picked up by sensitive EVPs.*
- *The ghosts can fluctuate temperatures of environments; spirits take energy from surroundings and this can lead to a drop or rise in immediate conditions which will be caught by the Thermography Cameras. It is a device that creates an image using infrared (IR) radiation,*
- *The movement of ghosts which is not visible in ordinary light could be visible to night vision cameras.*
- *The ghosts emit faint body heat signatures that are not visible but can register on a thermography camera.*

The process of Paranormal Ghost Investigation uses scientific tools and follows a structured scientific approach, but the whole process is founded on the above assumptions. Do these assumptions have a scientific basis?

We shall now explore this aspect:

Are assumptions (which are the basis of Paranormal Investigation) really Scientific

Let us take each assumption one by one and explore whether the assumption is based on scientific principles:

Ghosts create Cold Spots—Paranormal Investigators use scientific gadgets to look for “Cold Spots” using IR thermometers since they believe that ghostly presence is due to “Cold Spots” created by them. This assumption arises from the belief that the ghosts derive energy from the environment for their manifestation and this creates ‘Cold Spots’.

Cold spots are a reality and if we look at their scientific reasons, we come across many reasons other than that of ghost manifestation.

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Sam Ashford² cites some scientific basis for “Cold Spots” in his paper:

“Cold Spot” is “an area of localized coldness or a sudden decrease in ambient temperature.” These sudden temperature drops could be just a couple of degrees Celcius (barely noticeable) to over 5 degrees. The following environmental reasons may cause localized Cold Spots:

- **Draughts:** Even if the windows are closed, air bricks for ventilation or poorly sealed doors and windows can allow cold air from outside to come indoors, causing sudden temperature drops.
- **Damp and mould:** Damp patches can cause black mould to grow. This is a good indication that there are condensation problems. An excess of water vapour on the walls or floor can cause cold spots to form.
- **Lack of insulation:** Properties that aren't properly insulated will experience cold spots, dampness, and other issues that ghost hunters might attribute to paranormal activity.

The above are scientific reasons for Cold Spots and are verifiable. On the other hand, the scientific arguments in favour of ghost manifestation through cold spots go like this:

- The theory goes that for a spirit to manifest in our physical world, it requires energy. It sources this energy from the environment. So, as a ghost starts showing itself (or just communicating), it draws the heat from the air for the energy required, leaving behind cold spots.
- A second theory is that spirits come from a different dimension. Cold spots, along with areas where there is a sudden drop in air moisture, indicate a gateway to this spirit dimension. These gateways are often also associated with a drop in air pressure.

*The above arguments by Paranormal Investigators are just theories and do not have a way to verify the same, whereas there are other natural factors which cause cold spots, hence, we can conclude that **this assumption is not based on a scientific foundation.***

The second Assumption in the process of Paranormal Ghost Hunting is:-

Ghosts emit electromagnetic fields caught by EMF meters---

EMFs are everywhere, originating from appliances, cell phones, electrical wiring, and even the human body. The K-II EMF Meter helps measure these fields to identify appliances that produce high-level emissions, allowing users to make informed decisions.

Paranormal Ghost Investigators look for and eliminate these sources from the location before claiming the place to be haunted. They claim that ghosts emit electromagnetic fields which are captured by EMF/K2 Meters and if getting rid of the above sources, if the EMF meter still shows EMF radiations, it is taken as the presence of ghosts.

Is it really true? Can the investigators be sure that they have removed all known sources of EMF radiation?

I think they cannot claim that all sources other than ghostly presence have been removed by them. There are some sources that they can't even identify and remove. For example, some portions of land may have geomagnetic properties and EMF meters may be capturing EMF radiated by the geomagnetic property of the land.

I know of a place in Runn of Kutch where this geomagnetic property manifests-- there is a small patch of the slope of the road on the way to Kalo Dungar in Runn of Kutch where a car put in neutral gear moves backwards by the huge electromagnetic force and climbs the

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ingredient of slope by itself. This is not the result of haunting but demonstrates the strength of the electromagnetic field generated by the geomagnetic property of the stretch of land. At such places, EMF meters are certainly going to the presence of EMF fields emanating due to the geological property of the place and can be confused with a ghostly presence. Such factors are not detectable by Paranormal Investigators and can create fluctuations in EMF that are unrelated to any paranormal phenomena. There may be several other factors, not noticeable to paranormal investigators that emit radiations of EMF; even our bodies emit the same.

Another fact is that the belief in ghosts and the interpretation of EMF readings can be influenced by psychological factors. For example, the "placebo effect" or the power of suggestion can lead individuals to perceive a connection between EMF readings and ghostly activity. There is no empirical evidence that directly correlates EMF readings with the presence of ghosts. Most scientific studies on the paranormal have not found consistent, repeatable results that support the existence of ghosts or their detection through EMF measurements.

In summary, while EMF detectors can provide interesting data about the environment, they do not, necessarily, have a scientific basis for detecting ghosts.

Next in line is the assumption that

Ectoplasm, a static form of energy, emitted by ghosts create apparitions-

Many of us have seen a mist or fog that looks like it's swirling apparition. It could be ecto-mist or ghostly mist. The vaporous cloud usually appears several feet off the ground and can move swiftly or simply stay still. These ectoplasms have been captured in videos.

We do not know whether there is some scientific reason to relate such happenings to ghosts. Also, we do not know whether these are real or mere hallucinations.

Wikipedia³ mentions that **ectoplasm**, also known as simply **ecto**, is a substance or spiritual energy "exteriorized" by physical mediums. It was coined in 1894 by psychical researcher Charles Richet. Although the term is widespread in popular culture, there is no scientific evidence that ectoplasm exists and many purported examples were exposed as hoaxes fashioned from cheesecloth, gauze or other natural substances.

The term comes from the Ancient Greek words ἐκτός *ektos*, "outside" and πλάσμα *plasma*, "anything formed".

The physical existence of ectoplasm has not been scientifically demonstrated, and tested samples purported to be ectoplasm are various non-paranormal substances. Other researchers have duplicated ectoplasm with non-supernatural materials.

I strongly feel that Pareidolia may be at work when someone seems to have a glance at an ectoplasmic apparition. As we know Pareidolia is the illusory perception of meaningful patterns or images of familiar things in random or amorphous data, as a face seen on the moon. Ectoplasm is generally visualized in a misty environment which is not well-lighted. Mind must be making a pattern in a mist and we tend to hallucinate it as a misty ghost.

It appears that ectoplasm has no scientific explanation which can link it to and manifestation of ghosts.

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Another assumption on which the Paranormal Ghost investigation rests is:

Ghosts tend to appear as an orb of light- The assumption is that it is a lot easier for them to appear as an orb than appearing as apparitions as it takes a lot of energy for manifestation as apparition. Some people believe that orbs are the souls of deceased humans or animals that are travelling around. They may appear as:

- Transparent or translucent balls of light
- Round, blurry, fuzzy, and yellowish in colour
- Hovering over the ground



Picture of Orbs

Troy Taylor⁴ is of the view that orbs are not manifestations of ghosts. They are not evidence of paranormal activity or anything else.

Despite what has been seen and heard, there has never been any evidence to suggest that these “orbs” are related to ghosts. Yes, they have often turned up in photos that are taken at haunted locations but, as my research started to show, they could turn up literally everywhere.

The most common “orb” photos are merely refractions of light on the camera lens. This occurs when the camera flash bounces back from something reflective in the range of the camera. When this happens, it creates a perfectly round ball of light that appears to be within the parameters of the photo but is actually just an image on the lens itself. Many people often mistake these “orbs” for genuine evidence of ghosts, although I have never really been quite clear as to why that is. Most “orb” photos occur when the camera flash is used. Some of the photographers will insist that their flash was not on, which means it was and they didn't know it.

Even so, “orbs” don't have to have a camera flash to be created. They can also be caused by bright lights in an area where the photo is being taken, by angles of light and by many types of artificial lighting.

But are lights and camera flashes the only thing that can cause “orbs” to appear? Far from it! Other objects that end up in front of the camera lens and are mistaken for paranormal images are dust, moisture, pollen, insects, snow, rain, hair, ash and scores of other semi-microscopic particles. In almost every case, the camera flash reflects on the surface of one of these particles and seems to “glow”, as one might expect a ghostly image to do.

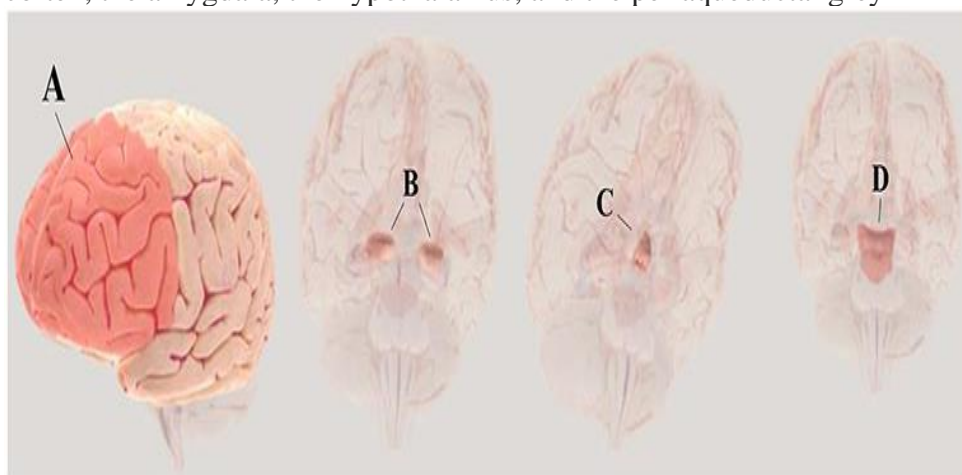
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Taylor has been able to establish that orbs can be explained differently than being explained as the presence of ghosts and hence this assumption also seems to be not founded on scientific grounds.

Moving on to the next assumption on which ghost hunting seems to be based-

EVPs depict voices, footsteps and noises created by ghosts---

Paranormal Ghost Investigation is exploring the unknown and when we venture into an unknown arena, fear springs up in us. Ariana Thoksakis and Megan H Papesh⁵ claim that fear interrupts important processes in the brain, and this can lead to irrational thinking patterns. Irrational thinking causes us to be more likely to jump to conclusions about our surroundings. When we are afraid, a few important brain areas become more active, including the prefrontal cortex, the amygdala, the hypothalamus, and the periaqueductal grey



- Figure - (A) The prefrontal cortex, is an area at the front of the brain responsible for giving meaning to events.
- (B) The amygdala, two almond-shaped areas inside the brain that put you on guard. (C) The hypothalamus, is a small area in the middle of the brain that controls panic responses as well as energy and stress levels. (D) The periaqueductal gray, an area inside the brain that controls how we respond to fear (Photograph credit: BrainFacts.org).

When you wake up in the middle of the night, the shadows can play tricks on your eyes. In this situation, your prefrontal cortex is interpreting your surroundings. It is dark and you cannot see very well, so your brain prepares you for the chance that one of those shadows could be something dangerous. Your amygdala receives this information from your prefrontal cortex and puts you on guard. Your hypothalamus then causes you to feel panicked and scared. Finally, imagine hearing a noise during this time. It is probably just the house settling or a neighbour going out, but your thoughts turn to ghosts and monsters.

Thus, what we hear on EVPs may be just Pareidolia at work.

Wikipedia⁶ also seems to support the above view when it says that even though within ghost hunting and parapsychology, electronic voice phenomena (EVP) are sounds found on electronic recordings that are interpreted as spirit voices but scientists regard EVP as a form of auditory pareidolia (interpreting random sounds as voices in one's own language).

Wikipedia further adds another cause for sounds on EVP. It says *Apophenia* could be another explanation for sounds on EVP. It is related to, but distinct from pareidolia. Apophenia is

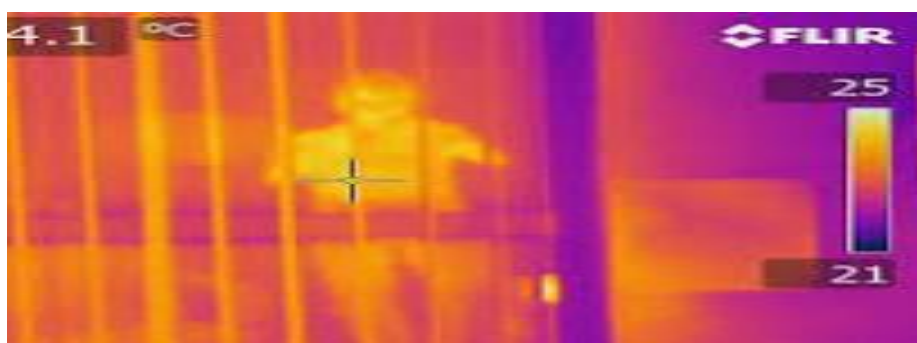
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defined as "the spontaneous finding of connections or meaning in things which are random, unconnected or meaningless", and has been put forward as a possible explanation. According to the psychologist James Alcock what people hear in EVP recordings can best be explained by apophenia, cross-modulation or expectation and wishful thinking. Alcock concluded, "Electronic Voice Phenomena are the products of hope and expectation; the claims wither away under the light of scientific scrutiny."

We now take up the last assumption on which Paranormal investigation rests:

The ghost manifest their presence as Thermal Images on a Thermal Camera—

In ghost hunting, many believe that ghosts draw energy from the environment while trying to manifest and this energy withdrawal creates temperature variations in the environment leaving cold spots and their presence becomes a thermal signature due to the comparative hot silhouette they possess and thermal cameras capture this signature and their picture surfaces on the camera as a distinct silhouette.



A question arises whether the silhouette appearing on thermal cameras can be explained in some way other than being a picture of a ghost.

Thermal cameras work exclusively with infrared radiation, they see the world as a great collection of temperatures. Colder items are shown as darkened, while hotter objects are shown in various colours ranging from red to bright white depending on how hot they are.

Thermascan published a paper⁷ which mentions that the spooky images are often captured of people who are not seemingly there. Fuzzy, faded images of individuals are commonly associated with ghosts, but this might not always be the case.

Thermal imaging cameras are adept at reading IR (infrared) light, an invisible form of electromagnetic radiation. This radiation is thermal-based because it is induced by heat. As we all know, objects will retain a certain amount of heat collected, and (depending on the environment) it will dissipate over time. ***Some ghost sightings are the after images of where people were and have left some thermal heat behind that hasn't cooled yet.***

There is another explanation provided for the thermal silhouette image on the thermal camera: Since a thermographer essentially stands directly in front of the area they are testing, their reflection, and the reflection of other things in the room can change the reading of a thermal camera. Such examples include reflections bouncing off shiny metal components, showing up on the thermal camera as hotspots when really they're just the reflection of something else. This means that some of the instances of paranormal activity detected using thermal imaging can be explained by thermal reflection.

(source:<https://www.pass-thermal.co.uk/blog/thermography-applications/paranormal-thermal-activity/>)

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Thus, these images on thermal cameras may not be of ghosts but must be heat signatures of some real people.

I tried to explore the scientific basis for all the above assumptions about ghosts and could not find any scientific explanation which could explain these assumptions about ghost behaviour but the research led me to alternate scientific explanations for these assumptions.

Thus, the assumptions on which the paranormal ghost investigations rest appear to be unscientific.

CONCLUSIONS

Paranormal investigations of haunted places do follow a structured path and use scientific gadgets and instruments. The investigation process is logical and often culminates in successful achievement of the desired aims.

It cannot be denied that Poltergeist Harassment is happening sporadically and spontaneously across the globe and many times the investigators are able to take action to alleviate the sufferings of the victims. Once the hauntings stop at the haunted place, the discussions on the presence of ghosts or whether the investigation was scientific have no meaning. The basic assumptions on which the paranormal investigators carry out their work may not have a scientific foundation but if the end result is achieved, great service is done to the victims. Even though my research finds no scientific basis behind the assumptions of Paranormal Investigation, I, still, salute the Paranormal Investigators for their commendable service to mankind.

I am sure that in future through the efforts of thinkers and researchers, science will one day advance and we shall know whether life exists after death and whether our ancestors live as spirits desiring to communicate with us.

After all, Parapsychology is all about such mysterious phenomena that defy scientific explanation and Parapsychologists all over the world are seeking scientific causes behind these!!!

We await the progress of science to enlighten us and till then we keep our fingers crossed!!

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Conflict of Interest

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