

Do Paranormal Investigators Really Encounter Ghosts

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ABSTRACT

Ghost Hunters are prospering in India and we can find a large number of videos streaming on YouTube. They do not like to be called Ghost Hunters and prefer to be known as Paranormal Investigators. They use several scientific gadgets in Paranormal Investigations, be it K2 Meter, Night vision cameras, Thermographic cameras or Infrared Thermometers. They use scientific instruments but is their investigation process scientific? Is paranormal investigation science or pseudoscience? Do they really encounter ghosts during the paranormal investigation? This paper intends to find answers to the above questions.

Keywords: *Ghosts, Spirits, Ghost Hunters, After Death Communication, Apparitions, paranormal investigators, Discarnate communications*

These days the profession of Paranormal Investigation, which is limited to Ghost Hunting, is mushrooming in India. YouTube is flooded with videos showing Paranormal Investigators waving flickering EMF meters, claiming to be communicating with Ghosts. They claim to have ghosts responding to their commands which is reflected by flickering lights on the EMF meters. Presumably, they frame a question and ask the ghost to respond by making one light flicker on the EMF meter if their answer is "Yes" and flicker two lights if the answer is "No" and lo! there appear one / or two flickers, thus, proving that communication is established with a ghost. Many a time, the EMF meter shows no response and they conclude that there is no presence of ghosts in that area and the place is not haunted. When there appears the presence of ghosts which is indicated through the flickering lights of the EMF meter, the Paranormal Investigators proceed to do a cleansing operation to make the haunted place free from Ghosts.

This has become a business! The clients are people who have been troubled by poltergeist activities and have lost peace of mind. They are scared that there is the presence of ghosts and these ghosts may cause harm to them. They are in badly need of help and the Paranormal Investigators come to their rescue.

There are famous haunted places where people don't dare go; paranormal investigators are tempted to approach these locations after seeking permission from respective authorities. The Paranormal Investigators not only do a social service but also do a thriving business. With virtually no investment, these investigators get to do a prospering business.

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Though I have no first-hand experience of ghost hunting with Paranormal Investigators, I did have occasions to interact with some Paranormal Investigators and was amused to observe them claim that they do scientific investigations. They were also found to be fuming against other investigators who were fakes and were spoiling this profession. As per them, the fake ones used some clandestine means to make EMF meters flicker and make the public believe that communication with ghosts is established. Also, if the new enthusiasts are not fake, they are led astray to wrong inferences as they rely only on one instrument i.e., the EMF meter. Sometimes EMF meters may be affected by factors unknown to the investigator and in the absence of confirmation from other sources, they may wrongly interpret the signals as coming from the ghosts. Experienced Paranormal Investigators don't rely only on one gadget. They have a good collection of gadgets which they use in their investigation.

As per Cohen Howard¹, the *Paranormal Investigators* are, actually, *Ghost Hunters*. Ed Grabianowski² observes that "Ghost-hunter clubs and societies have popped up all over the world. There is no government regulation of ghost hunters, nor is there an industry group that oversees their activities. These groups are almost all amateurs, and very few of them practice the scientific method. "Many of these groups are earnest and are making an honest effort to contribute to the field," said Liebeck. However, too many of them "are not in the business of conducting actual research or impartially evaluating evidence, but have apparently already decided what the 'truth' is and are just promoting their belief system. Waving a magnetometer in front of a TV set and announcing, 'They're here!' or photographing a bunch of flash-illuminated dust particles and proclaiming that 'The orbs are upset over our negative vibrations,' does not constitute an investigation."

As I mentioned earlier Cohen Howard¹ asserts that paranormal investigators are, actually, Ghost Hunters. He goes on to say that Paranormal Investigators (Ghost Hunters) use a variety of instruments--

*Ghost hunters use a variety of electronic devices, including EMF meters, digital thermometers, both handheld and static digital video cameras, including thermographic and night vision cameras, night vision goggles, and digital audio recorders. Other more traditional techniques are also used, such as conducting interviews and researching the history of allegedly haunted sites. Ghost hunters also refer to themselves as **Paranormal Investigators**.*

While these investigators use scientific instruments for their investigation, is the process scientific? They claim that their investigation is scientific and they are interacting with ghosts/spirits.

In this paper, we shall be examining this claim. We shall explore whether Paranormal Investigations are scientific or should be considered as Pseudoscience.

We shall explore whether they really encounter the ghosts/ spirits or there could be some other logical explanations to the factual observations they make during Paranormal Investigation.

Before we examine the claim, let us first understand the Paranormal Investigation e.g., Ghost Hunting.

Ghost Hunting (Paranormal Investigation)

Ghost Hunters, as they really are, prefer to call themselves Paranormal Investigators because they feel that the name Ghost Hunters discredits their profession as it tends to equate them

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with exorcists and other cheap healers (so-called Tantriks or झाड़ फूंक वाले बाबा). They consider their work as scientific investigation and hence they do not like to be equated to झाड़ फूंक वाले बाबा so they do not wish to be labelled as Ghost Hunters and prefer to be called Paranormal Investigators.

Respecting their sentiments, in this paper, we shall not use the term Ghost Hunters but shall call them Paranormal Investigators; after all, we are concerned with the gist of the matter and not the label. We shall explore how credible Paranormal Investigators (we ignore the mushroom crowd of fake investigators) conduct their experiments. But before that let us examine what instruments they use and what data these instruments record because without this knowledge we shall not be able to analyze their interpretation of encountering the ghosts/spirits

Instruments used in Paranormal Investigations

As per Cohen Howard the most common instruments used by Paranormal Investigators are:

- EMF meters/ K2 Meters,
- digital thermometers, both handheld and static
- digital video cameras, including thermographic and night vision cameras,
- night vision goggles, and
- EVP Recorders (Electronic Voice Phenomenon Recorders)

Let us examine each of these one by one

EMF/K2 meter



Figure 1: K2/EMF meter (source: <https://www.amazon.in/Magnetic-Detector-Hunting-Paranormal-Equipment/dp/B07LBK9RH6>)

In K2 meters the Five bright colored 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. For example, there is a small patch of slope of road on the way to Kalo Dungar in Runn of Kutch where a car put in neutral gear moves backwards by the electromagnetic force and climbs the ingredient of slope by itself. This is not result of haunting but demonstrates the strength of electromagnetic

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force which can do wonders! The K-II operates on a single 9V battery and reports EMF measurements in five milli Gauss ranges. The Paranormal Investigators use this meter with the assumption that the ghosts/spirits can emit magnetic radiations of varying intensities at their own will by flickering a K2 meter one/two. times responding to intelligent human commands. Whether this assumption is really true is subject matter of investigation.

Digital thermometers, both handheld and static



Figure 2—Thermometers used by Paranormal Investigators
(source:<https://paranormalmusings.com/ghost-hunting-thermometers-the-types-of-thermometers/>)

Digital Ghost Hunting Thermometers can help aspiring ghost hunters detect "cold spots," which are often attributed to areas of paranormal activity. 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. (There is no scientific base supporting this theory) 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-ghost-hunter/>)

Digital video cameras- thermographic & night vision cameras



shutterstock.com · 1924635449

(Figure 3—Thermography Camera
(source: <https://www.shutterstock.com/search/thermography>)

A thermographic camera (also called an infrared camera thermal imaging camera, thermal camera or thermal imager) is a device that creates an image using infrared (IR) radiation, similar to a normal camera that forms an image using visible light.

(https://en.wikipedia.org/wiki/Thermographic_camera)

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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 visualize temperature variations is what makes thermal cameras useful for ghost hunters, as they can potentially 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. (*Do they really emit such signatures is not scientifically known?*)

Night vision Cameras

If a ghost appears in front of your camera, there are two ways it could be captured, even in the dark. First, the entity might glow, or emit a light source – this might be any kind of light, from ultraviolet, to infrared or perhaps UV. It could be in the form of an orb or another shape, allowing you to capture it on your full spectrum camera.

Figure 4—Night Vision Camera used in Paranormal Investigation—



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

An article appearing in Higgypop Magazine³ elaborates on some points about night vision cameras as below,

"All cameras need light and in the case of night vision cameras, this light source is an infrared light. Usually, this is either built into the camera itself or is an external IR illuminator that is mounted on the camera. This light is invisible to the human eye but works in the same way as visible light does. The light from the infrared light source hits the object and reflects off and into the camera's lens. When switched to night vision mode the camera ignores visible light but becomes sensitive to infrared light only.

Let us see how a night vision camera can capture apparitions of ghosts.

Let's imagine an apparition walks past our camera and it appears to be semi-transparent. By this, we mean that you can see what is behind the apparition through the figure. For this to happen some of the light reflecting off of the scenery behind the ghost must be passing through the apparition and into the camera. This tells us that some light can pass through the ghost, but not all of the light. The ghost must be reflecting a percentage of the light in order for it to be visible - whether the light source is infrared or normal visible light. One possible

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explanation as to why a ghost might appear to be semi-transparent is that the apparition is in a partially manifested state and is composed of some kind of mist or vapour with a low density. This would allow for some light to pass through the shape but not all - in the same way that your car's headlights are less effective in foggy conditions.

If a manifesting ghost is composed of a type of mist, then logic dictates that there's no reason to assume that it should only reflect infrared light and not be visible. So again, this type of phenomenon would be visible to the naked eye in a well-lit environment as well as to night vision camera.

But many a time, witnesses report seeing ghosts that are so solid that it's impossible to distinguish them from a living person. Even in these cases naked human eye must be able to see it.

However, it is possible that different ghosts could react differently to different frequencies of light. Visible light might be able to completely pass through an apparition making it invisible to the human eye while infrared light reflects off of it making it visible to a camera only and not the naked eye. This could be true whether the ghost is in a mist-like manifesting state or as a solid figure. In such situations, night vision cameras could capture photos of ghosts/spirits.

There is one other possibility and that's that ghosts generate their own source of light. Paranormal investigators often link activity to the detection of electromagnetic energy and light is a form of EM, just like electromagnetism or static field. Hence night vision cameras could be capturing it.

Still, the theory stands unsubstantiated-- The problem with the idea that ghosts can emit light is summed up by a quote which often gets bandied around in the paranormal community: "Energy cannot be created or destroyed, it can only be changed from one form to another."

This principle of thermodynamics means that a ghost cannot just create energy in the form of light out of thin air, so this leaves us with just one question. Where could this light be coming from? Since ghosts are visions of the past, perhaps the light we see is somehow being transmitted from their time in the past.

Night vision goggles



Figure 5—Night vision Goggles used for Paranormal investigation.

How do night vision goggles work? That depends on which ones you're using. There are two types of technology used in night vision goggles. They are image-enhancement and thermal imaging.

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Image enhancement amplifies existing light. This makes images easier to see. Even on the darkest nights, tiny bits of light are present. Some of this light may be infrared light that people can't see. Night vision goggles using image enhancement technology collect all the available light. Then, they amplify it so that you can easily see what's going on in the dark.

The other night vision technology is called thermal imaging. Hot objects, including human bodies, give off some heat in the form of infrared light. Night vision goggles use thermal imaging technology to capture that infrared light. This way, you can see an image of what's going on in the dark. It's based on the amount of heat being made by objects.

Presumably, the Paranormal Investigator work on *the assumption that the ghosts can fluctuate heat transmissions* and thermal imaging goggles can catch these variations[a1] 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. *(However there is no scientific proof found to support this assumption)*

EVP Recorders (Electronic Voice Phenomenon Recorders)



Figure 6 –EVP recorder used in Paranormal Investigation

Within ghost hunting and parapsychology, 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.

While I have covered most of the gadgets which are used generally by credible Paranormal Investigators, there may be many more being used by more enlightened Investigators.

Also, a Walkie-Talkie is a must to keep communication going between the team members working at different spots of the haunted location.

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Gadgets and the assumptions on why they will mark the presence of ghost

Summarizing the use of gadgets as described above, we can say that

Electromagnetic Field (EMF) meters are the most common tools used by ghost hunters. The underlying assumption is the belief that spirits or ghosts may interact with the environment through electromagnetic fields.

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 camera.

Thermography Camera 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 Thermography Cameras.

Night Vision Goggles are used on the assumption that the ghosts can fluctuate heat transmissions and thermal imaging goggles can catch these variations[a2] 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.

EVP (Electronic Voice Phenomena) Recorders are used to capture unexplained voices or sounds that are not audible to the human ear underlying assumption being that the ghosts do emit faint sounds inaccessible to human ears.

Ghost hunters assess their presence and question them through K2 Meter and analyze recordings done through other gadgets in an attempt to identify messages from spirits.

While it is not known what made paranormal investigators reach the assumptions above but they very confidently assert that the gadgets do make them establish contact with the ghosts /Spirits.

We shall take up later the question of these assumptions being true/false and whether these have a scientific basis. First, let us understand the process of Paranormal Investigation.

Paranormal Investigation Process

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. Even though I do not have any first-hand experience with Paranormal Investigation but as per details available in literature and my logically 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 haunted place call these investigators. For locations learnt through the media, the investigators seek permission for investigation from the respective authorities.
- Reaching the place and doing a preliminary investigation and survey of the place to learn what ghostly activities are observed and taking actions to eliminate known sources of electromagnetic radiations so that Paranormal gadgets could be used effectively for ghost hunting when the investigation begins.

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- 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 analyze 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 scientific/natural reason for the haunting, we begin our vigil thereby 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 with 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-grab-ghosts-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 to 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 and 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 assigned 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.

These appear to be the logical steps in the process of Paranormal 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, "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 the occasion to interact with some prominent paranormal investigators.

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!!

Knowing the paranormal investigation process and results, let us now take up the main issue of the paper i.e., analyze whether the Paranormal Investigation Process is scientific, whether the investigators had encounters with ghosts in reality or whether the entities they encountered were something else.

I know that seeing is believing and to know a phenomenon better, one must experience it and I have done none!! Most people will wonder what credibility will my analysis have!

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I wish to state that I am basing my analysis on accepting what the paranormal investigators themselves *have observed* and believing their *end results*; only I do not agree with their inference that they have interacted with ghosts and in this paper, I am trying to find whether their assertion is true.

Since I believe what they have observed and the final results achieved, my analysis will carry weight as it will be logical and will be based on the facts as observed and stated by the Paranormal Investigators. Since I base my judgment on the work claimed and explained by eminent investigators themselves, the logical analysis should not fall short of credibility in any way.

Let us examine

Is Paranormal Investigation Science or Pseudoscience?

Steven Novella⁴ explores this aspect as follows,

"I wish to point to one aspect of so-called ghost hunting that marks it as pseudoscience- it is this – they don't carry out any actual hypothesis testing.

What they are doing: it's not science. There's not a single shred of evidence to suggest that ghosts exist, or that they can be identified by cold spots. Why are ghosts cold? Why do they never seem to show up in visible light, but infrared cameras always find them? Why can you never hear them speaking, but finding them in garbled audio (what they call electronic voice phenomenon or EVP) is absurdly common? The answer is that it's easier to find whatever you're looking for in distorted or unclear video and sound. This is a profession that thrives on false positives.

It is a fact that ghost-hunting, as practised, is nothing more than anomaly hunting – searching for things that seem unusual or out-of-place and then declaring such anomalies evidence of the paranormal. But there is no reason, *a priori*, to assume that a cold spot is evidence of anything paranormal or ghosts in particular.

Ghost hunters can be criticized for at least two distinct methodological flaws. The first is that they are primarily engaged in anomaly hunting, not hypothesis testing. The second is that they are engaged in sloppy anomaly hunting.

Also, Ghost hunters put forward "theories" (really hypotheses) and make observations. That's it. But they never close the circle – using observations or experiments to test those hypotheses, in a way that can potentially falsify them. For example, they find a cold spot in an allegedly haunted house, and they prematurely declare the cold spot an anomaly. This is sloppy anomaly hunting. They generally don't use their equipment properly, do not adequately gather baseline data, and they use no control for comparison. But even if they do precise anomaly hunting, and document an actual cold spot, all they do with that observation is spin what would be called a hand-waving ad hoc "just-so" story about what is causing the cold spot. (In other words, they just make shit up.) Weaving a paranormal "explanation" for the cold spot does not make it a scientific theory. Even calling it a theory indicates a lack of understanding of this point. At best such explanations are hypotheses. Now the hardest part of science comes into play – figure out a practical way to test that hypothesis. That is the most critical, and often the most difficult, step in the process– and it appears to be completely missing from the ghost hunters' repertoire."

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Those who claim that the Paranormal Investigation process is scientific put forth an example of EVP recordings-EVP (Electronic Voice Phenomena) can be very clear; characterizing it as a "low" threshold is entirely dependent on the standards that are placed upon it. If a so-called ghost hunter labels an inaudible murmur as evidence of paranormal energy, then most people would agree that is a very low standard, but when credible researchers record very clear audio of words being spoken when it is known for a fact that no human could have possibly produced it, that is fairly solid evidence.

Here the argument is being made that really good anomaly hunting is science. It also uses the "credible" fallacy – credible researchers still make mistakes, and calling them credible does not answer the criticism. Also, it assumes that "very clear audio" must mean "Ghost/Spirit" or "paranormal energy" or some such. But why? I think it is underestimating the effect of audio pareidolia – the brain's ability to match a speech pattern to random noise. It is said that "known for a fact that no human could have possibly produced the clear audio." How is that known, exactly? Have all other sources of the audio truly been ruled out? More importantly – how can we design an experiment to test whether or not a human-produced the audio? How many other alternate hypotheses can we generate, and how can we test them? Thus, there is no concrete argument in favor of proving that paranormal investigation can take a place in science. At the most, it could be Pseudoscience!

What is science and what is pseudoscience? The difference was brought out in my paper⁵ which posited that a phenomenon to be scientific must possess the following characteristics:

1. The general principle of causation- It is self-evidently impossible to have any effects before it has happened— for example- precognition could not be scientific (C D Broad⁶)

Paranormal Investigations assume that Ghosts exist even before the effects are observed. Hence the phenomenon is not scientific.

2. Unique Definition-The subject matter of the field of study must be uniquely defined, there must not be any ambiguity in the definition.

Paranormal Investigations possess a unique definition

3. Replicability- The subject matter must be replicable.

Obviously, the phenomena of ghost hunting are not replicable, hence cannot be scientific

4. No design flaws in related experimentation- The experimentation done in the field must be free from flaws in the design which mar the credibility of findings.

Many flaws were pointed in discussions above. Even with the utmost care, the design of experimentation cannot ensure that there is no other source present which can interfere with K2 meters and other devices, hence, there are chances of design flaws

5. Empiricism: The subject matter of the field must be explainable by empirical evidence Steven D. Schafersman⁷ explains that Empirical evidence is evidence that one can see, hear, touch, taste, or smell. Empirical evidence is important because it is evidence that others besides yourself can experience, and it is repeatable, so empirical evidence can be checked by yourself and others after knowledge claims are made by an individual. Empirical evidence is the only type of evidence that possesses these attributes and is, therefore, the only type used by scientists and critical thinkers to establish scientific theories.

The evidence of Ghost manifestation and communication is not empirical because no one seems to have seen ghosts, hence, paranormal investigations cannot be said to be scientific

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6. Testability and Falsifiability: A theory must be stated in a way that it can be tried to be disproven. Theories that cannot be tested or falsified are not scientific theories and any such knowledge is not scientific knowledge. A theory that is specified in imprecise terms or whose concepts are not accurately measurable cannot be tested and is therefore not scientific.

Paranormal investigations cannot be tested or falsified, the inferences are presumptions that contact was established with ghosts; whereas the actual truth is that the observed acts could be caused by someone even other than ghosts. Moreover, many investigators themselves are not confident whether ghosts exist, they assume that ghosts can cause magnetic/ thermal variation and since they observe such variations through their gadgets they infer that they have communicated with ghosts—these are only assertions which can neither be tested, verified or falsified.

7. Parsimony: When there are multiple explanations of a phenomenon, scientists must always accept the simplest or logically most economical explanation. Parsimony is a guiding principle that suggests that all things being equal, you should prefer the simplest possible explanation for a phenomenon or the simplest possible solution to a problem. For example, if you hear barking from inside your house, and you own a dog, it's more reasonable to assume that you're hearing your own dog right now than it is to assume that some other dog snuck in. This concept is called parsimony

Paranormal Investigations could possess the characteristics of Parsimony.

8. Objectivity Scientific knowledge is objective. Objectivity simply means the ability to see and accept facts as they are, not as one might wish them to be. To be objective, one has to guard against his own biases, beliefs, wishes, values, and preferences. The worst bias is "Confirmation bias"- **Confirmation bias** is the tendency to search for, interpret, favour, and recall information in a way that confirms or supports one's prior beliefs or values. Objectivity demands that one must set aside all sorts of subjective considerations, biases, and prejudices.

There is no objectivity in the claims of Paranormal Investigators. They suffer badly from "Confirmation Bias" because they believe that ghosts exist even before experimentation begins and they try to interpret/ justify observations as evidence of the existence of ghosts even when there could be alternate explanations. This "Confirmation Bias" is one of the important factors that goes against considering Paranormal Investigation as Science

9. Systematic Exploration: Puja Mondal⁸ posits-A scientific research adopts a certain sequential procedure, an organized plan or design of research for collecting and analysis of facts about the problem under study.

Generally, this plan includes a few scientific steps—formulation of hypothesis, collection of facts, analysis of facts (classification, coding, and tabulation) and scientific generalization and prediction.

Paranormal Investigation appears to be done systematically by first observing the location for magnetic fields etc. and then using gadgets for data collection and then analyzing and reaching findings. It is only their inference of connecting the observation to ghosts that seems wrong as first of all, they themselves are not sure about the existence of ghosts.

10. Precision- Continuing Puja Mondal⁸ 's thoughts- Scientific knowledge is precise. It is not vague like some literary writing. Tennyson wrote, "Every moment dies a man; every moment

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one is born", which is good literature but not science. To be good science, it should be written as: "In India, according to the 2001 census, every 10th second, on the average, dies a man; every 4th second, on the average, an infant is born." Precision requires giving an exact number or measurement. Instead of saying "most of the people are against love marriages," a scientific researcher says, "Ninety percent people are against love marriages".

Data collection in paranormal investigation is done in a precise manner, it is only wrong when an inference is drawn connecting it to ghosts

11. Accuracy- Scientific knowledge is accurate. A physician, like a common man, will not say that the patient has a slight temperature or has a very high temperature but after measuring with the help of a thermometer, he will pronounce that the patient is having a 101.2 F temperature. Accuracy simply means the truth or correctness of a statement or describing things in exact words as they are without jumping to unwarranted conclusions.

Data collection is accurately done and the data is precise and accurate.

The assessment done for Paranormal Investigation on each point is presented in italics under each point and it is obvious that the process has only some of the characteristics needed for labelling them as scientific. There are many characteristics which are missing from the process of Paranormal Investigation. Thus, these investigations cannot be termed scientific even though scientific instruments are used in the investigation.

By concluding that it is not science, it is not concluded that it is not credible. After all great service is done when sufferers from astounding notorious activities get a relief when these activities get stopped after Paranormal Investigators investigated and did cleansing.

If it is not science what it is?

Let us be clear that Science and Pseudoscience both attempt to increase our knowledge base about the physical world and mother nature around us. Both put forth theories and do analysis to infer about the world around us. The similarity is in a wider sense but the two terms differ widely.

Oxford Dictionary defines Pseudoscience as follows:—A pretended or spurious science; a collection of related beliefs about the world mistakenly regarded as being based on scientific method or as having the status that scientific truths now have.

The common-sense approach to understanding Pseudoscience is that a field that does not possess some characteristics of science could be pseudoscience.

As we saw in the above discussions Paranormal Investigations do possess some characteristics of science but miss many. Since it misses many characteristics, it is Pseudoscience.

In fact, Parapsychology, of which "life after death") is only a part, is Pseudoscience. Paranormal Investigations are a very tiny part of the subject of Life after Death and hence we should not feel disheartened when we conclude that Paranormal Investigation, even though uses scientific instruments, is not scientific but it comes under Pseudoscience

Having understood that like Parapsychology, the Paranormal Investigation is also Pseudoscience, let us take up 2nd question pertinent to our exploration in this paper:

Do Paranormal Investigators really encounter ghosts?

Paranormal Investigators believe that they are communicating with Ghosts because the response to their questions in some cases is being received by flickering of one/two... bulbs

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of K2 meter as per the pertinent answer to the posed question. Also, through their efforts, the activities at so-called haunted houses stop. They believe that intelligent responses can come only from ghosts.

In an article by Ed Grabianowski⁹, a view is projected that many ghost hunters are going about it backwards. They go into an investigation with an unchanging, dogmatic idea- that Ghosts exist. During the course of an investigation, they will interpret almost anything they find as evidence of a ghost. EVP recordings, cold spots or photographic anomalies all become additional ghostly phenomena, but the ghost hunters never seriously consider other, more earthly solutions. They start with the answer they want to reach even before they begin investigating."

I think nothing can be a more accurate description of Paranormal Investigation, they assume that ghost exists and then they attempt to prove it with whatever evidence comes in handy. This is a self-defeating and absurd way of analyzing aspects under study.

Another paranormal investigator Devraj Sanyal, founder of DOS¹⁰ (Detectives of Supernatural) says "When a person dies sometimes his consciousness, remains. I am explaining it in a more scientific way, Human brain is a computing system not silicon based but organic and when a living human being feels something or thinks something, a number of electrons and protons run through his nervous system to the brain and gives an output. Then only we can realize the feelings or understand something. And when a person dies under severe emotional stress like in case of murder, suicide or any accident, suddenly, the huge rush of these electrons and protons transfer themselves to an electromagnetic field (EMF) nearby and thus the consciousness and the emotion remains."

Does it mean that all ghosts whom they encounter have met a violent death? According to this theory, ghosts have electromagnetic substances arising out of the huge rush of electrons and protons in the brain which make them an electromagnetic entity at death. How convenient!! This also seems like thinking backwards as pointed out in the last paragraph!!

That's why paranormal investigators move around waving K2 Meters!! What proof is there that violent death creates a rush in the brain which makes the person have a discarnate magnetic identity? How could a person make such baseless wide claims which have no scientific basis??

In fact, if we carefully examine the modus operandi of Paranormal Investigation, we find that several assumptions (without any solid proof backing them) have been used by paranormal investigators so that they can convince their clients that they have dealt with Ghosts/ Spirits; Let me recall them from the paragraph narrating the process of Paranormal Investigation:

- Paranormal Investigators use K2 meters with ***the assumption that the ghosts/spirits can emit/receive magnetic radiations of varying intensities at their own wills.*** They use a K2 meter for establishing communication with discarnate spirits by posing a question and asking to answer yes by flickering one light and 'No' by flickering two lights.
- Paranormal Investigators use IR thermometers to detect "cold spots," which are often attributed to areas of paranormal activity. ***The assumption 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.*** Use an IR thermometer to measure abnormal cold spikes in certain areas where the surrounding air is otherwise warm.

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- Use of Thermographic Cameras are done on *the assumption that faint body heat signatures are given off by ghosts and spirits which will be captured only by Thermographic 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 camera*
- Night Vision Goggles 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.*
- EVP (Electronic Voice Phenomena) Recorders are used to capture unexplained voices or sounds that are not audible to the human ear at the time of recording. *It is assumed that the ghosts can emit low-frequency sounds which cannot be captured by Human ears but can get captured in EVP recorders*

Paranormal Investigators analyze these recordings and relate these as messages coming from messages from spirits. While it is not known what made the paranormal reach the assumptions above, they very confidently assert that the gadgets do enable them to establish contact with ghosts / Spirits. I could not find any scientific proof that the assumptions as above marked in bold italics are true. It is not a valid logic to connect the observations with ghosts/spirits if the underlying assumptions that ghosts/spirits can even do these acts.

It cannot be denied that sometimes K2 meters do blink in response to questions, IR thermometers do catch cold spots, thermal Cameras on rare occasions capture blurred patterns, and other gadgets do give responses and depict unusual patterns. But the question is whether these come from discarnate spirits / Ghosts. To date there is no compelling evidence to relate them to ghosts and spirits. Their exact causal roots are not known. Who causes them and how? There is a theory that ghosts cause them. There could be alternate theories. Could the flickering be not due to some other entity which responds to command? Could it not be due to mental powers of investigators themselves who may be exercising Psychokinetic mental powers to make K2 Meter flicker as per their wish under the influence of strong "Confirmation Bias" and their wishes come true due to the Placebo effect? You may say all this is far-fetched but so is the thought of ghosts doing it!! There is no scientific facts supporting the presumption that ghosts interact with paranormal investigators.

There can be many more convincing alternative theories against all the data recorded by the gadgets. Hence, we can't be absolutely sure that Paranormal Investigators have communicated with Ghosts.

Another question mark to the theory that they interacted with ghosts is the assumptions they are making about the capabilities and behaviour of so-called ghosts. There is no evidence to prove that the assumptions made by paranormal investigators that ghosts are influenced by magnetic field, can fluctuate environment temperature, have the capability of making themselves visible to thermographic/ night vision cameras etc.... are founded on scientific facts.

The very foundation of their interacting with ghosts is based on underlying assumptions they use which have no scientific base. So how can it be accepted that they really do encounter ghosts? It could be some other entity influencing the gadgets or it could be Pareidolia at work

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making them have a perception of what they observed or inferred from the gadgets. Confirmation Bias and Placebo effects also cannot be ruled out!

CONCLUSION

The above discussions make it abundantly clear that the Paranormal Investigation falls short of being scientific, at best it can be categorized as Pseudoscience. The discussions also bust the myth that only using scientific instruments in an investigation makes the investigation scientific i.e., You can use scientific instruments but the process of using could be unscientific or at best could be considered as Pseudoscience

On the question of whether Paranormal Investigators really encounter ghosts, there is a clear indication provided in the above paragraphs that this seems to be far from the truth. The Paranormal Investigators are assuming that ghosts exist and are grossly misinterpreting pieces of evidence to prove that they have interacted with ghosts.

I conclude this paper by citing the views of a social psychologist Barry Markovsky¹¹ with whom I fully concur:

"As for all the devices ghost hunters use to capture sounds, electrical fields and infrared radiation—they may look scientific, but they are not. Measurements are worthless without some knowledge of the thing you are measuring.

When ghost hunters descend on an allegedly haunted location for a night of meandering and measurement, they usually find something that they later deem to be paranormal. It may be a moving door (Breeze?), a chill (a gap in the floorboard?), a glow (Light entering from outside?), electrical fluctuations (old wiring), or bumps and faint voices (crew in other room?)—whatever happens, the ghost hunters will draw a bulls-eye around it and interpret it as "Evidence" and investigate no further.

Alleged hauntings usually have plenty of non-ghostly explanations. In cases where cameras are deemed to capture "orbs" i.e., video captured many small globes of light seemingly moving around the room could be, in reality, tiny particles of dust wafting close to the camera lens, made to bloom by the camera's infrared lights. That they appear to float around the room is an optical illusion. Watch any orb video closely and you'll see they never go behind objects in the room. That's exactly what you would expect with dust particles close to the camera lens.

One more thing, virtually all ghostly experiences involve impediments to making accurate perceptions and judgments—Bad Lighting, Emotional arousal, sleep phenomena, social influences, culture, a misunderstanding of how recording devices work, and the prior beliefs and personality traits of those who claim to see ghosts. All of these hold the potential to induce unforgettable ghostly encounters.

But all can be explained without ghosts being real."

So, it is possible to have alternate explanations about the pieces of evidence usually put forth by Paranormal Investigators as proof of encountering ghosts.

The very subject whether do ghosts exist is debatable. There are some aspects which indicate existence of ghosts but there are overwhelming arguments against their existence. I cannot dwell on this in this paper as this itself can be a subject matter of a full-fledged paper. In fact I have already written a paper –“DO GHOSTS EXIST” which bring forth compelling

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evidences that ghosts do not exist. Readers can view this paper by opening this link--
<https://ijsi.in/articles/do-ghosts-exist/>.

If Ghosts do not exist then how can Paranormal Investigators really encounter them?

The discussions in this paper clearly reveal that there is a great probability that the Paranormal Investigators do not encounter ghosts in reality!!

But, still, I do not undermine their investigation. In my opinion, they are doing great work, really credible work, if it ends in eliminating the suffering of victims of so-called ghostly tantrums. Their efforts may not be in the direction of establishing contacts with ghosts but they may be rendering valuable social service. Can we then not call them *Social Workers* rather than Paranormal Investigators!!

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Conflict of Interest

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