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The PSI Journal of Investigative Psychical Research is published twice per year and is made available, electronically, to members of Paranormal Site Investigators for no charge. The Journal is the only known UK journal specialising in haunting phenomena and paranormal investigation process. The primary objective of the Journal is to present field-oriented articles about paranormal investigation techniques, and to represent current-thinking research in the field.
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Investigation reports are published where Paranormal Site Investigators has assessed ethical issues and granted approval, and where investigation venue owners have consented. All participants of research and investigations have been protected by use of pseudonyms.

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Orbs - Introducing the Dust Wight

With reference to the article *A Life Less Orbinary?* by Dave Wood BSc, in the PSI Journal of Investigative Psychical Research (Volume 3, Number 1, February 2007), I wonder if the long-standing debate about whether orbs are physical dust or spiritual manifestations might be rather missing the point.

The weight of evidence that orbs are small air-borne particles is compelling, and the article and its subsequently associated website — The Orb Zone (http://www.theorbzone.com) — describe in commendable detail the means by which the vast majority of orb photographs can be generated by natural objects such as dust. Before summarily dismissing all such dusty orbs as mundane *and* trivial however, I feel we should pause to consider an inconvenient but logical prospect.

Whilst the annals of psychical research show full-blown poltergeist phenomena (in which heavy objects are moved over considerable distances) are exceptionally rare — how much easier and more common could it be for a psycho-kinetic entity to merely move a mote of dust slightly closer to a camera?

It seems to me that if we admit to the possibility of the poltergeist, then we must also concede the possibility of the dust wight.

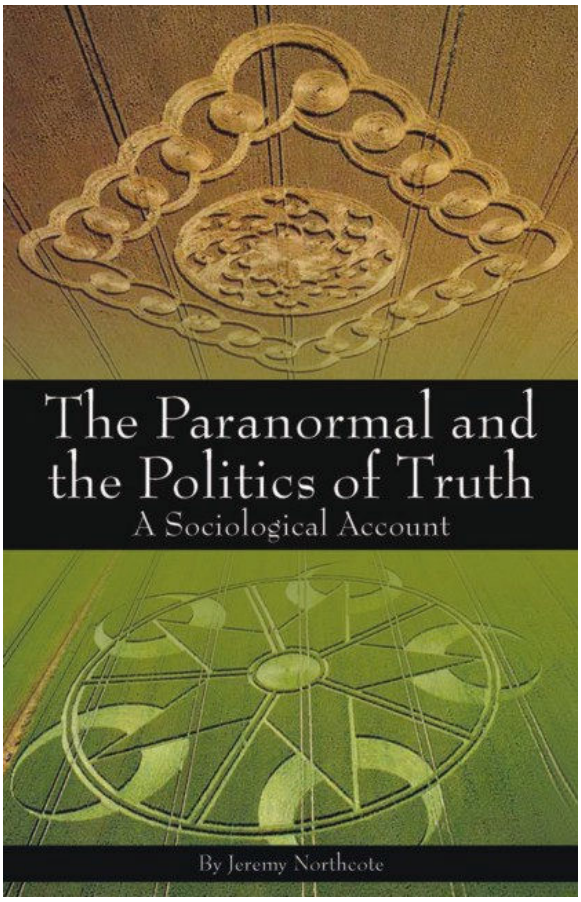
Anecdotes abound with instances where orbs seem to appear when asked, and this circumstance may offer an early opportunity of identifying the presence or absence of paranormal phenomena. Although undoubtedly fraught with logistical difficulties, a statistical comparison of summoned and uninvited orbs might be possible, and revealing.

Furthermore, orbs that appear spontaneously at a time and place profoundly meaningful for the witness, may also provide fruitful grounds for speculation and research. However, like the willow-the-wisps of folklore, these particular fuzzy lights may lead us to a deeply uncanny and hazardous place — the realm of synchronicity.

Dave Wood has demonstrated that orbs are among the most prosaic things in the world, yet mystics have ever marvelled at the immanence of the spiritual in the material. I fancy that even this advanced stage of the orb debate still leaves ample wriggle-room for believers looking for a loophole into a different dimension.

Ken Taylor
Author (wavewrights.com) and patron of BSPRI (bspri.org.uk).

Book Review - Paranormal and the Politics of Trust: A Sociological Account



The Paranormal and the Politics of Truth: A Sociological Account. Northcote, J., 2007. Imprint Academic. pp.250. ISBN: 9781845400712.

Reviewed by Trystan Swale

Much paper has been spent examining the psychology and sociology of supernatural experience, but within *The Paranormal and the Politics of Truth* Dr Northcote attempts to uncover the often heated politics of belief and ideologies which surround it.

Within his introduction Northcote outlines his goals. He immediately stresses he is not consciously furthering any particular agenda but seeks to understand the motivation and methods by which the stakeholders of scepticism, science, religion and paranormal belief can entrench themselves as guardians of the truth. The author acknowledges his stance may leave him open to criticism from paranormal enthusiasts of all persuasions as he does not consider any one truth to be factually absolute.

Chapter one, 'Defining "The Paranormal"', outlines Northcote's personal thoughts as to what can be termed paranormal. His broad definition reaches out to include anything which cannot be explained by the academic or religious establishment. This encompasses all realms of spiritualism, UFOlogy and occultism centred around the notion of extraterrestrial or non-physical intelligence. Notably it also touches upon subjects which may be considered more Fortean than supernatural; including cryptozoology and cryptoarchaeology.

'A History of Struggle', chapter two, provides a retrospective account of the methods employed by the Church to quell threats to its establishment by occultists. Northcote draws similarities between this historical power struggle and the modern-day debate as to the existence – or otherwise – of paranormal phenomena.

Third chapter 'The Players in the Contemporary Debate' analyses the ideational positions of all sides of the paranormal debate. Rather than merely treating such politics as those of the believer versus the sceptic, the author observes that some proponents, such as fundamentalist Christians, believe in paranormal phenomena yet view it as a threat to their beliefs and lifestyle.

Chapter four, 'Becoming a Participant' examines the various sociological processes by which one may become interested in the paranormal and develop a particular political stance. From the various theories Northcote creates a broad framework of explanation.

Fifth chapter, 'The Discursive Basis of Conflict', addresses the underlying issues which divide participants. Northcote effectively argues that it is not the nature of reality which is essentially under debate, but rather a string of assumptive discourses and ideas.

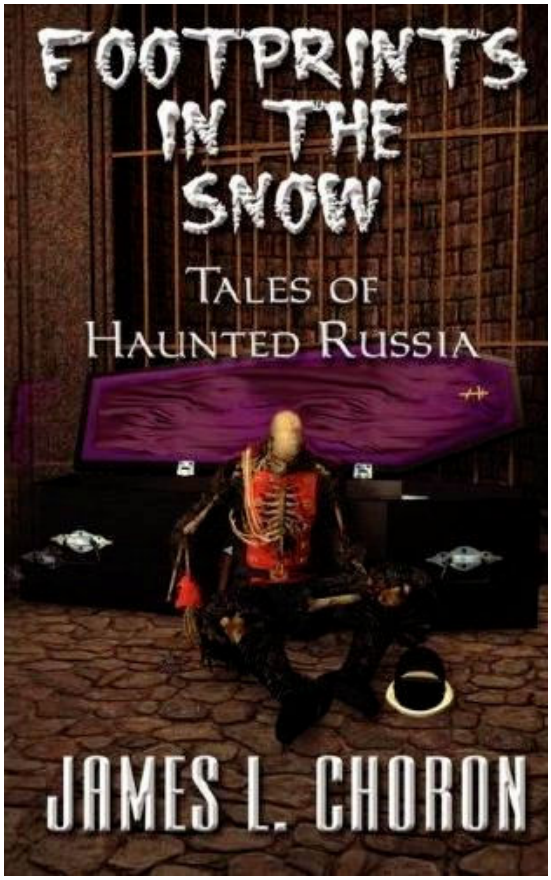
Within the final chapter, 'Strategic Action Within the Debate', Northcote scrutinises the methods by which participants engage in disputes. As readers of any paranormal related newsgroup or online forum will attest, very often these actions involve the demonisation of opponents who threaten a personal truth. The picture painted within this chapter is depressing: participants are represented as reinforcers of particular discourses, unwilling to achieve mutual understanding with those who hold other truths.

Northcote explores the possibility of breaking the impasse in the conclusion, outlining a set of conditions and rules by which participants can respectfully discuss their differences. He suggests a 'civil, democratic' dialogue would be the most productive, with the onus upon agreeing methodological boundaries for experimentation.

This notion is supported by the example of the Hyman-Honorton debate which brought parties together to engage in Ganzfeld experimentation as a co-operative search for truth.

Whether these suggestions will ever be accepted as a guideline for progress remains to be seen, yet *The Paranormal and the Politics of Truth* succeeds in exposing how and why contemporary paranormal debate functions in the way it does. Those who pass their time continuing the debate in online newsgroups and discussion forums would be well served to consider whether the truth they seek is personal or factual.

Book Review - Footprints in the Snow: Tales of Haunted Russia



Footprints in the Snow: Tales of Haunted Russia. Choron, L.J., 2007. Zumaya Publications, Austin, Texas, USA. pp.268. ISBN: 978-1-934135-06-8.

Review by Trystan Swale

Following the dissolution of the former Soviet Union in 1991 practically all areas of Russia's culture have become more readily accessible to the West. It was inevitable that details of the country's ghostly heritage would filter through, although it has taken the writing of American journalist James L. Choron to assist with this. As you would expect from its title, *Footprints in the Snow* recites a selection of ghost tales from across the Federation, many of which were previously unknown to the outside world.

Within the preface Choron reveals his seventeen year association with the suburbs of Moscow and lays out his credentials as a journalist, a role he considers to be one of a 'professional skeptic'. Choron also justifies his decision to focus upon many low profile ghost stories, considering entertainment and the provision of new information to be more worthy than returning to already well documented cases. The author also says that all cases have been investigated before being chosen for inclusion, although the criteria of these investigations is not revealed.

Rather than pursue a geographical approach to categorise the content across such a huge landmass, Choron sensibly divides his content into nine parts by what he considers to be common themes.

Part one focuses upon 'the spirits who seem to carry on with their earthly lives'. From the long dead brewer working as a quality controller, to the invisible schoolgirl who still submits work to her teachers, these ghosts display a formidable range of physical talents worthy of further investigation.

Part two scours Russian battlefields for the ghosts of soldiers and other military combatants. Amidst apparitions of damaged bombers and singing troopers much space is given to 'the legion of the damned'. These are the Dekabristi, revolutionaries pushed into Siberia by Tsar Nicholas I in the first half of the 19th century. Sighted on numerous occasions roaming across Russia, Choron considers whether apparitions are more 'urban myth' than genuine ghosts.

Part three presents three tales linked to the unrest stemming from the attempted political coup in 1991. Each concerns heroes from the past who suddenly reappeared at a time of need and played key roles in quelling the uprising.

Part four provides details of 'houses, buildings and fields with resident spirits'. The main highlight is Choron's own research into the ghost said to reside in Moscow's Hotel Metropol.

Part five draws the reader to locations with a sinister history. Sounds of gunfire, sirens and shouting are still heard at Site 36 Gulag (concentration camp for political and criminal prisoners), whilst apparitions of young girls are seen in a Moscow building where teenagers of a similar description were murdered in 1949.

Continuing the theme from the previous chapter, part six tells of two of the Soviet Union's most cold and ruthless political figures and the appearances they have made since their deaths.

Part seven deals with ghosts who had a task to fulfil before they could rest. We learn of the man who chipped away at his own headstone to amend the spelling, and the aristocrat who rose from the grave to tend to the dying amidst the Spanish Flu epidemic in Novogorod.

The penultimate part eight switches attention to the ghosts of children. Its highlight is the remarkable tale of an elderly couple who are regularly seen accompanied by the apparition of a small girl at a child's grave.

Numerous witnesses have seen the girl yet the couple themselves remain oblivious to her presence. The author claims to having seen photographic evidence of this phenomenon but it is not reproduced.

Part nine recites a number of love stories with supernatural themes. These include the couple who sit by their own graves at the Novi Davichi Convent, and the ghostly woman who returned to visit her dying husband – observed by other members of their family.

Choron's afterword underpins the tones of Russian culture and popular belief which run throughout the book. He notes that many Russians are paranormal believers. However, he also observes that although Soviet authority viewed the paranormal as unwelcome superstition, its structure and systematic efficiency provides today's paranormal investigators with the methodology needed to fairly assess cases in a manner that is both 'comprehensive and scientific'. No further mention is made in *Footprints in the Snow* as to the precise method of this scientific inquiry, although this is unsurprising as from the first chapter Choron writes for an audience seeking a 'good scary story' rather than any detailed research. To this extent *Footprints in the Snow* is an enjoyable, entertaining read sure to be a favourite amongst those readers who enjoy the thrill of a mystery.

Article: What's that Noise?

Article:
What's that Noise? An Exploration into the New House Effect

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Abstract

Auditory phenomena are a significant part of many 'haunted house' cases and many experiencer-based paranormal investigations. The New House Effect is a theory that contends that individuals hear more natural sounds within a new environment, such as a new house, which are 'tuned out' over time. The extended application follows that investigators in a 'new' environment can experience the New House Effect, as can individuals who suddenly label their house as 'haunted'.

This study borrowed results from a Philip experiment replication, conducted by the authors, in conjunction with the University of Liverpool. In the experiment, participants reported perceptions of 'noise' whilst such noises were objectively recorded; this took place over five trials. The hypothesis was that individuals would report proportionally less 'noise' over time. The results broadly supported the hypothesis but were insufficiently robust to draw firm conclusions. A range of new research opportunities and implications for paranormal investigators were identified.

Introduction

Witnessing a ghost is perhaps the most common popular perception of 'haunting cases'. In reality such 'hauntings' are defined by a huge range of ostensible paranormal events, and, in general, auditory phenomena are perhaps more common than visual (McCue, 2002). Certainly between accounts of footsteps, slamming doors, knocking and a myriad of anomalous noises, auditory perceptions are a crucial feature of many haunting cases and paranormal investigations alike.

The New House Effect (NHE) – a theory developed respectively by Jason Braithwaite of the University of Birmingham and Maurice Townsend of the Association of the Scientific Study of Anomalous Phenomena (ASSAP) – begins with the propensity to notice a range of unusual noises in a novel environment that one tunes out over time.

Those who remember unusual creaking when first spending the night in a new home or those who move close to a busy main road may recall that, after time, they tend not to notice those sounds and the sound of the busy road eventually seems to be 'tune out'. Selective attention has been much researched by psychologists, so what can the role of attention tell us about haunting cases and paranormal investigations?

In 1890 noted American psychologist William James said of attention: "it implies withdrawal from some things in order to deal effectively with others"; however attention is not always a deliberate allocation of our limited mental resources (Gazzaniga et al, 2002).

The concept of selective attention is neatly summed up thus, in an introductory psychology book (Cardwell et al, 1996):

> "The world presents us with a continuous stream of sensory information. However, we do not register in the same way as an audio or video cassette player records material. Our capacity for information processing seems to be limited. If we had to 'attend' to all information bombarding our senses we would have no time to do anything else…"

In 1958 British psychologist Donald Broadbent likened our attention to an 'information processing system'. His model describes the brain as having a limited capacity, being capable of only allowing us to 'attend' to a certain amount of information (Gazzaniga et al, 2002). The model describes a 'gate mechanism' which is, in effect, 'open' to attended information and 'closed' to other information. Whilst mainstream opinion on attention has been greatly refined in the last fifty years, the thrust of Broadbent's model is still applicable today and has been substantiated by much experimental evidence.

Gazzaniga et al (2002) describe two main categories of attention: voluntary (or endogenous) attention and reflexive (or exogenous) attention. Voluntary attention relates to our ability to deliberately focus on something: so perhaps deciding to 'take in' the words of this article rather than listening to the television in the background. Reflexive attention refers to an 'event' which forcibly captures our attention, such as the television 'blowing up' whilst we read.

Applying this model to the New House Effect, a 'novel' sound is likely to forcibly capture our attention, eliciting reflexive attention. Thus when in a new environment one might notice every creaking floorboard or metal pipe banging as they cool down, each wind-caused door rattle or

banging of a tree against a window (Townsend, 2006). As these sounds become 'normal', as you spend more time in the environment, they cease to become reflexive 'events' that you pay attention to; in effect you 'tune them out'. These sounds might still be noticeable at night, as there is probably fewer other stimuli trying to get your attention. Similarly such sounds might be more common at night, as the structure of the house cools down (Townsend, 2006).

New House: Old House – Labeling a Haunting

Many haunting cases comprise of a series of unusual or ambiguous events. A location is not haunted until a person 'labels' it as haunted. If the person or group living at a location does not define these unusual events as a haunting, it effectively becomes a series of events with a different explanation, or ignored altogether.

Anecdotally it has been observed that many 'haunting' cases begin with a single (often misattributed) event. This might be photographing dust using a digital camera or some sort of visual event, even seeing a figure of some kind. Once this haunted 'label' has been applied it is reasonable that any unexpected event is viewed in terms of whether it contributes to the haunting, for example hearing floorboards creaking – was that 'the ghost'?

Once one event has taken place and a haunting is 'expected', an individual's schematic knowledge of hauntings – often derived from the mass media, and including unusual noises – can guide their expectations.

It would seem reasonable to theorise that people begin to voluntarily pay more attention to their environment following an attribution of a haunting – it is known that 'arousal' (such as fear) does lead to a greater than normal capacity for attention (Gazzaniga et al, 2002). Those perfectly natural 'noises' that have been ever present suddenly become noticeable; the sense of expectation might even lead to reflexive attention to a previous ignored sound.

So once someone has labelled their house 'haunted' it becomes, in some ways, a 'new' environment again. All those unusual, but natural, sounds are suddenly 'attended' to and may even be seen as 'evidence' for the haunting.

Often the challenge in such active investigation cases is discerning what event came first. Auditory sounds might be presented as part of a substantive haunting 'package' if the household requests an investigation.

New House Effect and Paranormal Investigations

The implications of the New House Effect on conducting paranormal investigators are fairly clear. Every new investigation environment is a 'new house' and most of the unusual sounds heard by experiencers could be natural and normal for the building. However the number of sound-sensory experiences might be falsely deemed 'significant' by experiences, particularly: where their attention is focused on experiencing unusual events; where investigations take place at night (when there are more 'cooling down' noises and fewer other sounds to be distracted by); and where experienced are 'aroused' by the general environment.

Whist empirical evidence would be useful to substantiate this, it seems reasonable that the number of sounds heard could be reduced by investigator fatigue (where tiredness reduces the capacity for attention - Gazzaniga et al, 2002) and where investigators are primed to concentrate on the visual mode rather than the auditory. Similarly, where sounds are so regular that experiencers become accustomed to them during the course of the investigation they might be 'tuned out'. One case the author was involved with saw experiencers reporting occasional and highly irregular 'clicking' sounds. Analysis of the video camera recording the session revealed that the sound occurred frequently and regularly, but went largely unnoticed by experiencers.

Double Trouble

The compensatory method of involving someone with intimate knowledge of a location to establish 'normal' sounds may be inappropriate. If someone living in a property regularly 'tunes out' natural but unusual noises they may seem unnatural to him or her when pointed out. Thus someone who lives in a 'haunted house' reporting that normal sounds are indeed abnormal could have two effects. Firstly it could lead investigators to falsely believe that the auditory events are paranormal in origin. Secondly the sudden notice of the unusual sounds could add a new dimension to the 'haunting' as perceived by the client, and has the potential to do harm.

However in some circumstances with intimate knowledge of a building will be able to provide pointers towards what may be, to them, more obvious noises; however complete reliance on such witnesses for full range of sounds a building might produce is inadvisable.

An Accidental Experimental Technique

The authors acted as part of a 'sitter group' for mass replication of the famed 1970s Toronto 'Philip Experiment', contributing to a PhD thesis for a student at the University of Liverpool.

Each session was recorded and all perceptions rigorously recorded by the analyst after each session. Towards the end of the run of sessions participants noticed that they felt they had noticed more 'unusual sounds' at the start of the run compared to the end of the run.
A theory was developed that the New House Effect might explain this downturn in auditory experiences. A hypothesis was developed: the number of sounds reported by participants would reduce as a proportion of the sounds objectively recorded during the sessions. The sessions were not specifically designed to test the New House Effect and therefore carry significant limitations, nevertheless it was felt useful to present the method and result in this exploratory piece.

Methodology

Design:
Five experimental sessions were set up as part of the Philip replication study. In all, nine experimental sessions were held. The last four were not analysed for the purpose of this article, because, during the sixth session participants and the analyst had noticed the possible New House Effect. Recognition of the effect was deemed an unacceptable confound as it could have introduced experimenter and participant bias.

The independent variable was the uncontrolled noises throughout the session as recorded by a video camera. The dependent variable was the rate at which participants noticed and reported these sounds.

The control condition was a similar session with no participants or experimenters present.

Participants:
Four participants comprised the 'sitter' group. Participants were self-selecting, aware of aims of the Philip experiment and were constant throughout all five sessions studied.

Materials:
A Sony Handycam DCR C14E was used to record each session. An Olympus VN-240 Dictaphone was also used to record the control session. The Dictaphone was set to omni-direction in order to gain some parity with the video camera.

Procedure:
Each session, including the control session, took place fortnightly on a Monday evening at approximately the same time in the same room. In all sessions, including the control, participant's chairs, instrumentation and Philip experiment aids were set up in exactly the same location. During experimental sessions the same participants sat in the same seats. Participants were briefed to follow the instructions of the Philip replication experiment. Participants were asked to verbally report all phenomena in the visual and auditory modes. In the control condition the video camera and Dictaphone were place next to one another.

Analysis:
The analyst, one of the participants, viewed each tape recording on two occasions. They recorded the precise details of any noises heard on camera, including a description of the sound and whether or not participants reported hearing the sound.

Results

Table 1 shows the score of the four participants as a group, comparing the number of sounds noticed during session time compared to the number of sounds unnoticed.

Unfortunately insufficient data was consistently captured in each of the trials to allow a robust use of an inferential statistical test, in order to assess the likelihood of the results being the consequence of chance.

Whilst the results show a decrease in the proportion of sounds noticed by participants between the first trial – being 33% - and the fifth trial – being 11% - the trials in between showed mixed results.

One incidental finding which shall be discussed later is the level of objective noise recorded during the control condition. The video camera recorded fifty instances of noise whilst the Dictaphone recorded thirteen at the same time and location. The fifty instances recorded by the video camera were ten units higher than the next 'noisiest' trial and were more than three times higher the rate recorded by the Dictaphone.

Table 1: Sounds noticed and unnoticed by participant groups during sessions

Session	Sounds Noticed	Sounds Unnoticed	Total Sounds	% Sounds Noticed
1	4	8	12	33.33
2	4	16	20	20.00
3	11	29	40	27.50
4	8	16	24	33.33
5	4	31	35	11.43
Control (Video Camera)	-	-	50	-
Control (Dictaphone)	-	-	13	-

Discussion

The results of this analysis do not provide robust evidence for the hypothesis: that that the number of sounds reported by participants would reduce as a proportion of the sounds objectively recorded during the sessions. Whilst the hypothesis was broadly supported by the evidence overall, the lack of facility to rule out chance and the lack of a firm linear trend means results should be treated with caution.

Limitations and Confounds

As noted previously, this was an accidental experimental technique lifted from a separate study. As such the experiment could not be designed specifically to limit any potential confounds. However the findings might provide a firm basis for future research.

Whilst this accidental nature presents weaknesses it also presents strengths. As the New House Effect was not the original object of the research – and because further sessions where the effect had been highlighted were omitted – it is fairly unlikely that experimenter and participant effects confounded the results. However, it should be noted that the use of one analyst who was also a participant is not desirable.

The 'field' setting of the conditions also presented methodological strengths and weaknesses. One major limitation was the control over the nature and rate of noises recorded. The first trial, for instance, recorded a relatively small number of sounds compared to subsequent trials. This inconsistency of data makes inferences less robust. Similarly the 'type' of noise could not be controlled. Thus some noises were louder than others, and the proportions of such noise were inconsistent across conditions. In contrast the experiment did have ecological validity: trials with artificially produced noise would not have been so close to the genuine 'house' environment.

A further limitation of the study was the validity and reliability of the objective recording equipment used. As noted previously the video camera recorded more 'noises' than the Dictaphone. It seems likely that the higher instances of noise in the control condition was due to the effect of microphone 'audio gain circuit' (Alldrin, 1998): a microphone has a greater range in a more quiet environment (where participants are not present, for example) and therefore may have picked up sounds from neighbouring houses and floors that would not ordinarily be so audible. It also seems likely that the tape video camera may have produced more noise internally that participants could not have heard, when compared to the digital Dictaphone with fewer moving parts.

The fact that a video camera was used during the experimental conditions could have distorted the results.

Ideas for Future Research

The limitations and confounds of this study means there is plenty of scope for a more authoritative exploration into the New House Effect. An experiment specifically designed to limit the confounds of this procedure could produce more robust results. If a naturalistic environment was selected it may be advisable to consider an environment with a greater number of 'natural' sounds. However it might be more appropriate to design a procedure to be executed within a more controlled environment using artificial noise.

There are two directions future research could take. The first could use participants who are entirely new to an environment, to explore the generic effects of attention that could be applied to a paranormal investigation setting. The other possibility is a naturalistic procedure involving participants in their own home, to explore whether drawing attention to noise in a paranormal context could produce a mini New House Effect. There are, however, serious ethical considerations associated with this option. An extension of this procedure could involve an exploration into the New House phenomena in buildings that are in the process of being renovated (Townsend, 2006). This could shed new light on the non-scientific claim that house renovations cause increased 'ghost' activity (Society for Paranormal Investigation, 2007).

A different avenue of research that unintended findings point towards is experimentation into the validity of monitoring equipment in objectively recording 'noise' in an investigation setting. An exploration into the effect of solid state recording devices versus mechanical (discs, tapes, etc) which could cause extraneous noise could be valuable to the field.

Implications for Paranormal Investigation

Due to the results of the current study not being robust it would be difficult to draw firm conclusions. However there is enough evidence to warrant paranormal investigators considering the following points:

- An assessment of whether noises attributed to the paranormal could be misattribution resulting from the perception of a 'haunted house' context.

- A reconsideration of value of experienced 'noise' during paranormal investigations. A further recommendation could be investigating a property on as many occasions as possible, to monitor such effects.
- A further reconsideration of relying on clients to assess whether anomalous noises are 'normal' within an environment.
- It would be reasonable for paranormal investigators to consider the validity of their recording equipment against the tasks for which they are employed.

Conclusion

Whilst not robust, it is hoped that the theory and results of this study will help paranormal investigators to consider the validity of current methods in light of the results of the New House Effect.

It is also hoped that future, more authoritative, research might help solidify these principles and guide our field of study.

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Article: EVP - Analysing Paranormal Sound Recordings

Article:
EVP – Analysing Paranormal Sound Recordings

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Abstract

This article examines the problems of analysing paranormal sound recordings, particularly those containing apparent voices or EVP ('electronic voice phenomenon'). It is not intended to be an EVP guide (there are plenty of those around). Rather it is advice to those researchers who take audio (or video) recorders on paranormal investigations in the hope of capturing anomalous sounds, usually voices, who wish to avoid some of the pitfalls. This material may also be of interest to EVP researchers using 'open microphone' methods.

Introduction

Tape recorders have been taken on vigils for decades and have frequently recorded odd sounds. Sometimes the intention of using such a recorder was simply to replace note books by dictating records of observations as they occurred. On occasion, recorders were also used to try to record specific audio phenomena which had been reported by witnesses. Indeed, most reported hauntings involve some sort of unusual sounds, such as whispering, scratching or voices of unknown origin. More recently sound recorders have started to be used routinely on vigils specifically to try to catch ghostly voices. These voices differ from the usual sounds reported in haunting cases in that they are not heard at the time of the recording but only appear later, during play back. This makes them, effectively, Electronic Voice Phenomena (EVP). People have been researching EVP for decades. There was never, until recently, any suggestion that you needed a special (haunted) location to get EVP. Indeed, many EVP researchers worked successfully at home.

In 'traditional' EVP research, people often use high levels of simulated background noise (like the 'white noise' hiss of a radio not tuned in to any particular station) in their recordings which they believe assists with the production of paranormal voices.

On vigils, by contrast, people usually seek out quiet locations for recordings (though they may ask questions out loud to any ghosts who might be present). Also, in traditional EVP research, strenuous efforts are usually made to exclude the possibility of any natural voices getting onto the recording. Unfortunately, in a vigil situation it is difficult, or impossible, to avoid the voices of other investigators and bystanders (even people outside the building) sometimes getting onto recordings. In such cases, investigators search for 'unknown' voices in recordings containing many known, natural voices.

Sound and Vision

A major problem with reviewing audio recordings for paranormal material (whether voices or anything else) is that, unless you are using a video camera, it is often difficult to recall all the possible natural sources of sounds present. Even if you are using a video, odd sounds might come from objects out of the shot. At least with a video camera present, it might be possible to eliminate some natural causes of strange sounds. There is no point locking off a room with just an audio recorder in it as many sounds recorded will inevitably remain 'unexplained' though it would be impossible to prove they were 'paranormal'.

We humans are used to seeing and hearing at the same time. The two senses work in tandem to make sense of the world. For instance, it is easier to hear accurately what someone says if you can see their lips moving (and to be deceived when the two conflict, as in the illusion known as the McGurk Effect). If we are deprived of the sense of sight, as in the case of listening to a sound-only recording, it is easy to misinterpret noises and not realise their source. In particular, if we are primed to expect something unusual (such as a ghostly voice) it is all too easy for expectation to be fulfilled even when there are, in fact, mundane causes for it.

The Cocktail Party Effect

Imagine you are at a noisy party with loud music and everyone talking. You're not paying any attention to the hubbub which becomes a background noise. Then, suddenly, you hear your name mentioned. You look up and see it is someone you know, on the far side of the room, talking about you. Your brain could hear all the noise but filtered it out until your name was mentioned, because it was relevant to you. This is the Cocktail Party Effect.

It is significant here because people quickly get used to background sounds (even in noisy factories) so that they don't notice them any more - because the sound is not relevant. The same can happen on vigils. You might hear every little creak of furniture and rustle of paper, at first, but not for long. The sounds don't stop; you just don't hear them anymore. Though you may not remember hearing a weird sound during a vigil, you shouldn't be surprised when it appears, loud and proud, on an audio recording of the session. A sound recorder, unlike your brain, is a dumb instrument that records everything within its capabilities without discrimination. It never gets used to background noises, like squeaky chairs and creaking floorboards.

Another interesting point arises from the Cocktail Party Effect. Different people will get used to background noises at different rates. That means that some people may hear a sound whereas others don't (because only some are already not hearing such noises). Needless to say, if this happens many people will claim that the sound must be paranormal as only some people heard it! This sort of thing is frequently reported on vigils!

Sound recorders may actually be more sensitive to quiet sounds than your ears. So sounds can appear on recordings that you wouldn't have heard, even if you'd been paying attention. In addition, many microphones are strongly directional, so that they pick up sounds preferentially from one particular direction while ignoring others. So a sound recorder may pick up stuff we couldn't hear. In addition, a recorder may not record stuff that investigators hear. In neither case does it mean the sound was necessarily paranormal, it is just that recorders work differently to human hearing.

So, in summary it is perfectly possible for:

- Some people in an area, and not others, to hear a sound
- Sounds to be heard by investigators but not recorded
- Sounds to be recorded but not heard by investigators

Any of these situations can arise from completely mundane causes.

Don't edit your recordings!

Once you have a sound recording containing apparently anomalous sounds, make copies of it and keep it safe - it could be valuable evidence. Digital recordings are the best in this regard, as it is possible to make any number of perfect copies.

- It inevitably destroys some of the original data
- it removes vital evidence of context
- it can make later analysis impossible
- it can 'create' false sounds (see 'Audio Editing Software' below)
- it can look bad to people who wish to dismiss your possibly paranormal recordings out of hand.

If you wish cut out a section of your recording to show a suspected paranormal sound to others, include a few seconds before and after the event as well. These are important to establish the context of the suspected paranormal bit. If you just play people the sound itself they have no idea of the context. For instance, is the anomalous sound one of many previous similar sounds? Is it loud or soft (many apparently paranormal sounds are very faint) compared to the ambient sounds? Is there any 'build up' to the sound or does it just suddenly appear? All these points could provide important clues to the sounds origin that cannot be picked up by listening to the sound alone. The less context you give to a sound, the easier it is to misinterpret.

Audio editing software

Audio editing software is easily available nowadays; some of it very cheap indeed (like shareware or freeware). It is tempting to use such software to 'enhance' apparent voices or other paranormal sounds. However, there is a serious problem with this approach. While it is true that you can reduce distracting background noise from a recording, the process is not perfect and it inevitably alters the sounds permanently. Audio editing software can certainly make ordinary, real human voices in a noisy recording sound better. If, on the other hand, you have recorded a random noise that just happens to sound like a voice, repeated use of noise removal, filtering, etc, can make the noise sound more like a voice (even though it isn't one). You could end up listening to an artefact of the overuse of audio enhancement rather than a real voice!

For example, suppose you hear something faint in a noisy background that could possibly be a voice. If you apply filtering and it sounds more like a voice, though still unintelligible, there is inevitably a temptation to do more filtering, to see if it gets clearer. If you continue to apply 'enhancements', the process may exaggerate the features that are voice-like even if it isn't a voice. Worse, 'enhancement' can even introduce 'new' features to the sound that are just artefacts of the process, rather than real recorded sounds. Audio enhancement software is not 'intelligent' - it does not 'know' you are trying to enhance speech from noise. With each repeated run you just get further and further away from the original sound until, ultimately it may be completely lost.

If you really must use audio editing software on your paranormal recordings, never apply more than one or two 'enhancements' per sample and apply exactly the same process to ALL your recordings. If you apply different types of 'enhancement', to different degrees, to each recording, then you will not be able to objectively compare samples. In some noise reduction processes you have to nominate an area of the recording as ‘noise’ so that it can then be removed from the sample you are interested in. Obviously, the exact contents of this selection will vary from recording to recording so, again, the results will vary from sample to sample.

In general, most audio editing software is designed to edit and enhance sound clips of voice or music with a reasonable signal to noise ratio. It is not usually able to recover faint signals from significant ambient noise, which is a typical scenario in paranormal sound recording. For this reason, the tools provided in non-specialist audio editing software, such as noise removal, may be too aggressive for use with paranormal sound recordings. Such software may be fine for removing an annoying hiss from an otherwise clear music recording. It should leave the music relatively untouched. However, when used to try to enhance faint paranormal sounds, it may change them so significantly that the results are of no use as evidence. This is why, ideally, you should aim to avoid all such audio enhancement. You should, at the very least, always keep an original unedited copy of your recording for later research. If in doubt – don’t edit!

Consider the context

Background noise is important! It provides an audio context and reassures the listener that the recording has not been manipulated. It can also provide clues to any possible natural explanations for apparently paranormal sounds. For instance, is the paranormal sound louder than the ambient background noise, about the same level or fainter? If the sound is louder than the background noise, then there is the possibility that it is a real sound that was not noted at the time or was forgotten. It is also possible that the microphone was directional and happened to be aimed directly at the sound source. It could also be radio or electrical interference.

If the apparently paranormal sound (APS) sound is at the same level as, or fainter than, the background ambient noise, then it could be a chance effect. Background noise is, typically, random and unpredictable. If two elements of such noise (such as a squeaky chair and a creaking floorboard or an electric fan and a noise from outside) happen to occur at the same time, they may combine to sound like something quite different and weird. By listening to the background over a long period, you may be able to deduce if that is what happened.

You might think it unlikely that you could pick up a sound fainter than the background noise. However, a noise that forms a definite pattern (including voices) can often be picked out from random noise which has no pattern. This may often be the case with voice-like recordings.

Sometimes you may record sounds that come from outside the building (assuming you're inside) where you are recording. You might even pick up the voice of someone passing the building outside. Such sounds may appear to be coming from inside the building as there is no easy way of telling, from a simple recording, where a particular sound originated.

You should always keep a note of where, when and how the recording was made and the equipment used. Recorders vary a lot in specification. This helps to establish the context.

Auto gain circuit

While listening to the recording, you may hear the background noise appear to fade drastically when a loud sound is picked up and then return to its previous level. This means that your recorder probably has an auto-gain circuit (AGC) whose job is to keep sound levels roughly constant. Most voice recorders have an AGC and it usually can't be switched off.

The problem is, the AGC turns to high gain during quiet periods (amplifying background noise) and low gain during noisy ones (when the background apparently fades away). This can make it difficult to judge the relative loudness of different sound sources from the recording. By amplifying sound during quiet periods, the AGC can exaggerate background noise, which can produce false APSs. In addition, the AGC can affect the very part of the recorder (the microphone input and lead, which can act as an antenna) that is most susceptible to electromagnetic interference, so making any problem worse.

An AGC can give normal recordings a 'weird' feel. The unnatural way in which the background sound can suddenly vanish and re-appear can feel quite unnatural (which it is) and spooky. If you are on a vigil where people talk from time to time, interspersed with quiet periods, you may hear this effect a lot. Sadly, it's just normal operation for the AGC, which is designed primarily for 'average' consumer applications (such as recording music) where there are not usually long silent periods.

Some people deliberately ask questions out loud to sound recorders to elicit EVP answers. They leave a silent gap for the answer before posing the next question. If the recorder has an AGC, it will, unfortunately, tend to amplify the bits between the questions so that background noise will be more prominent during the 'answer' section. This exaggerated noise could be mistaken for voices and it will happen in the periods when the listener is expecting 'answers'.

Automatic gain circuits are common both in voice recorders and video cameras. If you can get hold of a recorder with manual controls, so that you can override AGC, it would certainly make life easier. Such equipment is, however, likely to be rare and expensive.

Compressed digital audio files

Many people use digital audio equipment to record paranormal sounds and EVP. While there are many advantages to digital recording, there is also one potential problem. Many popular audio formats (like MP3, WMA) are compressed. This wouldn't be too bad except that such formats are 'lossy'. This means that the sound stored is not identical to the one recorded and original information is lost (hence 'loss-y'). Even if you use analogue audio equipment, you will probably use a computer to analyse and store your recordings so that compression is still a potential problem.

There are various different methods for compressing audio data. Some are based on the way humans perceive sound so that, for instance, anything that we would not normally notice is simply eliminated before it is stored. In recordings of normal voice or music (for which such compressed formats are fine) you would probably never notice the difference. However, other sounds, such as background noises, often contain a wider spread of frequencies than in voice or music. Such sounds may be noticeably altered by compression techniques. Such alteration could produce artefacts that might sound voice-like.

You should try to use uncompressed digital formats, like WAV, if you can, for recording and storing paranormal sounds. If you cannot use these, please bear in mind that what you have stored in your digital audio file is probably slightly different from what was recorded. It is possible that some apparent voices, particularly in noisy recordings, may be artefacts of the compression process.

Outdoors

There are particular problems to consider when making recordings made out of doors.

For one thing, the wind can affect the microphone, producing loud noises that drown out other sounds. You can buy microphone wind screens to stop these problems.

You also need to be aware that ambient background sound levels out of doors are likely to be higher than indoors. In addition, the wind can affect sound so that it can carry further than usual, as well as producing other odd effects. Occasionally real voices (or fragments of speech) from a distance might become audible on sound recordings, particularly if you are using a directional microphone.

Analysis: Listening

The most obvious way to analyse a sound recording is to listen to it, though it is also the most subjective. It is important to listen to large sections of the recording at any one time so that you become accustomed to the context (see above), particularly the ambient background sound level and other natural sounds. Listening to small sections can leave you with a false impression of the occasion and any anomalies found. Were there, for instance, lots of sounds similar to the APS or was it unique?

It is difficult to judge what caused a particular noise (like the sound of a moving table) unless you go back to the site of the vigil and examine the scene carefully. You may be able to reproduce certain sounds by moving likely objects around or tapping them gently. This does not necessarily imply that the objects were moved paranormally. You really need to use a video recorder to obtain good evidence for phenomena like that.

One of the most common things people listen for, however, is apparent paranormal voices (or EVP). The big question then becomes – how do you know that a particular sound is speech?

People learn to recognise human speech instinctively from childhood (it is done unconsciously, like walking or swimming). Unlike most voice recognition software, humans can pick up words despite differing pronunciations and accents and noisy environments. Human language recognition accepts the possibility of 'false positives' (unlike software) as a price worth paying for not missing potentially vital information. It does mean, however, that sometimes we can become convinced we have heard a word or message even if we're wrong.

If words are missed or only partially heard, we often fill in an 'appropriate' substitute based on the context. So, if someone said to you 'that ball shred', you would almost certainly hear 'that ball is red' because it makes sense from the context (unlike the words actually spoken).

Your brain substitutes 'is' for 'sh' without you even being aware of it and you would later be convinced that you heard it correctly.

The kind of apparent speech recorded on vigils is frequently not even as clear as 'that ball shred'. Indeed, it can sound like gibberish to people not familiar with EVP. You will often find that people disagree about what words are allegedly said. Perhaps the best way to sort this out is to find a group of friends, preferably people not interested in EVP, and ask them what their opinion is and then take a vote. Make sure the clips you play include a few seconds of context (see above) on either side of the APS. Very importantly, do not tell your judges what words to expect as expectation strongly affects results in speech interpretation. There is more on judging content later.

Analysis: Waveforms

How do we know that a certain sound is human speech? It may seem obvious to most people but it is a difficult problem, as scientists trying to make reliable voice recognition software have discovered. It is called the 'speech detection problem' and is still being actively researched.

Even once you have positively identified speech in a sound, there is another hard problem to follow - how to understand precisely what is being said.

This is the 'speech recognition problem'. Understanding these problems is central to analysing apparently paranormal voices. This is the 'speech recognition problem'. Understanding these problems is central to analysing apparently paranormal voices.

When detecting human speech, an important concept is the idea of 'voiced' sounds. These are sounds (like most vowel sounds) that involve the use of the larynx. If you put your hand over your larynx (at the base of your throat) you can feel it vibrate when you make 'voiced' sounds (like the ‘e’ in ‘let’). Some sounds, like 's' (as in 'less') or 't' (as in 'let') are not voiced - they require only lips and tongue to produce. Also, if you whisper, you do not ‘voice’ sounds. This 'voicing' sound is called the ‘fundamental frequency’ (or F0).

Voiced sounds are so common that they exist in almost all words. So any fragment of speech of more than a syllable or two should include at least one voiced section. This is useful because voiced sounds have recognisable characteristics. The sound the larynx makes is low frequency and usually at a higher volume than unvoiced sounds. Look at the following examples of natural human speech (figs 1-3). They come from signal analysis software. Shareware audio editing software often includes this sort of display of waveforms. A waveform is the wave shape made by the recorded sound.

Figure 1

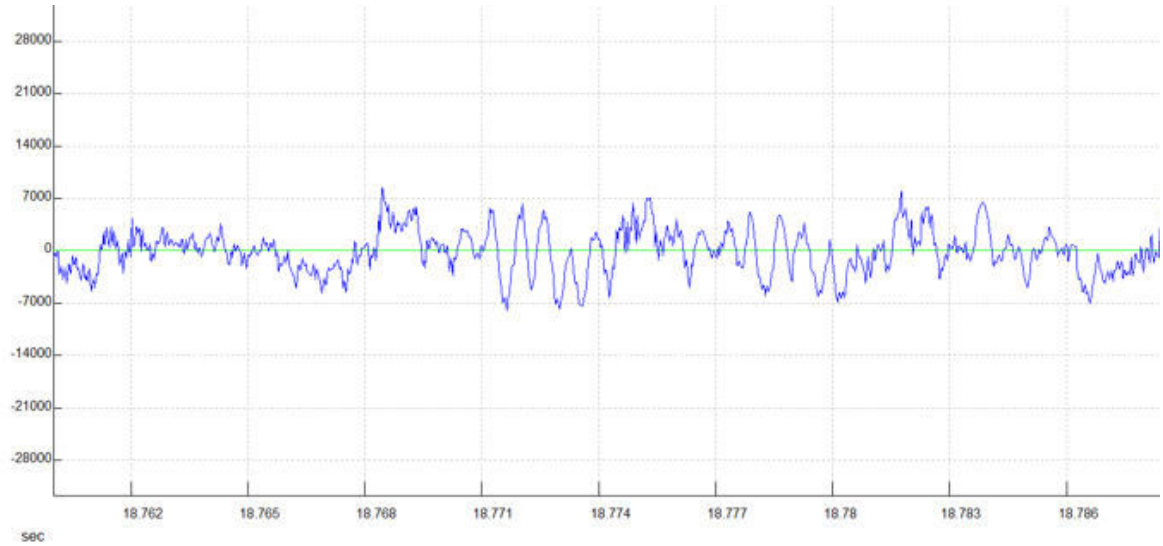

Fig 1: This is the waveform of voiced vowel sound EH, as in the 'e' in the word 'let'. The graph shows sound intensity variation (vertical) against time (horizontal).

Figure 2

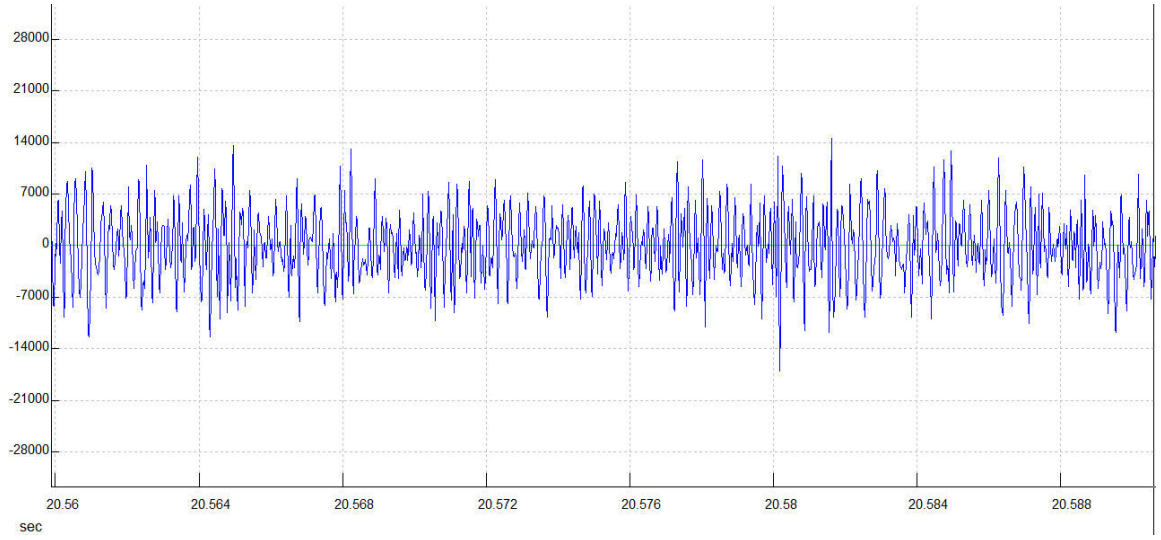

Fig 2: This is the unvoiced T sound, also as in the word 'let'. It is from the same recording at fig 1. Notice how the wave crests are closer together than in fig 1. When wave crests are far apart it implies low frequency. The voiced E in fig 1 contains lower frequencies.

Figure 3

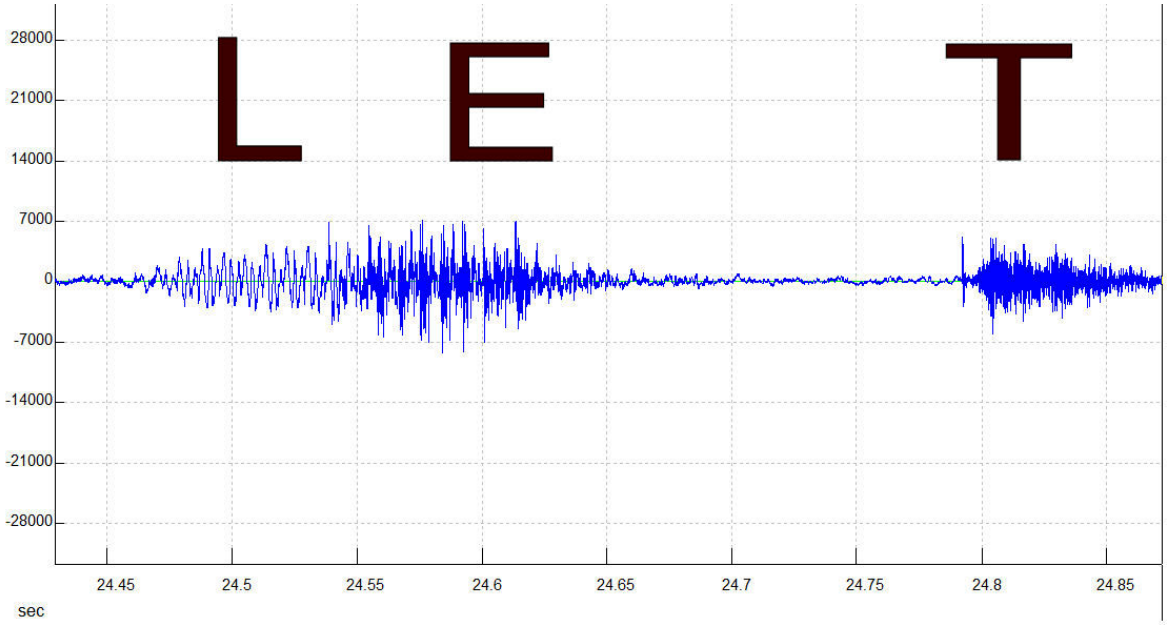

Fig 3: This is the complete word 'let' (ordinary human speech). Notice the frequency increases from the L to the E (which are both voiced) though both are much lower frequency than the unvoiced T sound. There is a gap of over one tenth of a second between the E and the T, while the tongue and lips are re-arranged to sound the T! Note how the voiced section is generally louder (wave crests are higher) than the final unvoiced part.

The individual distinct sounds of speech are called 'phonemes'. You can see them easily in the LET example (see figures above) where the phonemes happen to correspond to individual letters, though this isn't always true. Some phonemes are composed of multiple letters (like 'ph' being pronounced as 'f'). Phonemes are generally reasonably distinct from each other when displayed as waveforms. Try recording your own voice and displaying the waveforms to see what various different phonemes look like.

If the phonemes look right for normal human speech, and it sounds reasonably intelligible, then it probably is a natural voice. It could just be a voice not noticed at the time of the recording. Even if there are no obvious phonemes then it could still be a normal voice but distorted for some reason. At least you can positively identify normal human speech, if it is present and undistorted, though. Of course, it might be argued that paranormal speech could show the same waveforms as normal speech. If so, waveform analysis will not help you distinguish between the two!

Figure 4

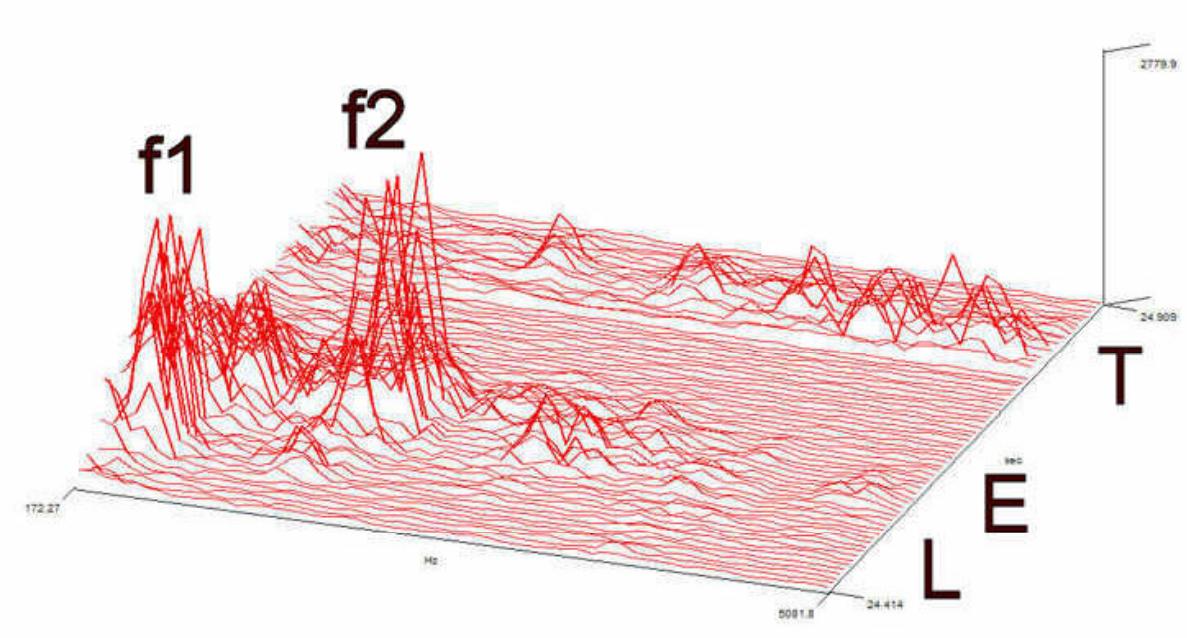

Fig 4: This figure shows the frequency (bottom axis) versus time (right axis) with sound intensity (or volume) as a vertical axis in a three dimensional representation.

Analysis: Frequency

In the next stage of voice analysis you will be able to resolve that vexed question; what exactly is being said (in theory, anyway)? In simple speech recognition software, frequency analysis is used to determine the identity of each phoneme. To do this, you need to look at the frequencies in the sound sample. Some audio editing software allows you to use fast Fourier transforms (FFTs) to analyse the frequency spectrums of sounds. Below you can see the same word LET (normal human voice) as a frequency spectrum.

The large frequency peaks, labelled F1 and F2, you see in figure 4 above are called formants. The exact frequencies of such formants are determined by the precise shape of the vocal tract of the person talking. Essentially, there are certain shapes in the vocal tract where sounds resonate (which means that certain frequencies are effectively amplified). As a result, formants generally occur at around 1000 Hz intervals. In the case of voiced vowels, the frequencies are harmonics (whole number multiples) of the fundamental frequency. However, only a selection of all the possible harmonics, those that are resonated, are ever present. Also, the lower frequency formants (below around 2500 Hz) may be suppressed in consonants (see the T in figure 4 above, for instance) by a phenomenon known as antiresonance due to oral constrictions. Overall, formant frequencies generally fall between 250 and 3800 Hz.

Phonemes contain combinations of formants. Particular phonemes may be identified by unique combinations of formants. These formants are used by the human brain to recognise phonemes. (This is, of course, a huge simplification but sine wave speech, discussed below, demonstrates that formant frequencies alone are enough to understand speech). The two main formant frequencies in the E sound in figure 4 are around 700 Hz (F1 in figure) and 1800 Hz (F2 in figure). These frequencies are not fixed and they vary significantly from person to person and from time to time in individuals. Phonemes may contain up to six formants. The main two are often enough to uniquely identify them, though three is more typical.

If you can see these formants in an APS then it should, in theory, be possible to deduce the phonemes from them. Once you've done that you can assemble the word phonetically. If you say it out loud, you should be able to work out what it is. In the above example the answer should be 'L-EH-T' which is, of course, pronounced 'let'.

Of course, nothing is simple in life. Formant frequencies vary from individual to individual, between sexes and due to accents. You should also be aware that phonemes can be modified by other phonemes before and after (a process called coarticulation). For instance, where a 't' follows an 's', the two may run together as 's', as in 'get some' which may sound like 'guess-some'.

You should certainly look for formants in paranormal recordings that contain apparent voices if you have suitable software. It could give a clue as to whether the voice is real or some kind of auditory illusion.

Analysis: Phonetic software

There is software available to help analyse speech phonetically. A good example is Praat, written by Paul Boersma and David Weenink. It is available to download from the web. The software can measure, and alter, many speech parameters used by phoneticists to analyse speech. You cannot use the software to 'validate' paranormal speech as real or otherwise, as it was never designed to do that, but it can highlight differences between ordinary real speech and random noise.

Analysis: Are they really words?

The techniques mentioned above should allow you to identify real speech. If your recording does indeed look like real speech, when analysed in software, it may be paranormal, if you can show there is no possible natural origin (such as a real voice that was not remembered or noticed at the time of the recording). But what about sounds that don't look like speech when analysed in software but still sound like words? How can you tell if there are real words present and not just an auditory illusion? To do this, you need to know more about how people recognise words.

Speech is understood by humans using phonemes. Our brains, completely unconsciously, turn these basic building blocks into words and phrases. We can identify phonemes at a rate 20 per second but can only follow similar non-speech sounds at a rate of around 1 per second. It is clear, then, that phoneme characteristics are built into our memory for quick recognition as, indeed, are words. Since our brains are able to sort out such problems as coarticulation, multiple simultaneous voices, noisy environments and accents, it is clear that recognition of phonemes and words must happen in tandem. The system of recognising speech is very flexible but the cost is occasional errors. Sometimes we hear different words from those actually said and occasionally we hear words when only random noise is present.

We recognise phonemes primarily using formants. This has been demonstrated with the experimental tool called 'sine wave speech'. In sine wave speech, the formants in ordinary speech are identified by software and then synthesised into an entirely new sound using pure sine waves to represent only the formant frequency peaks. Thus, all the usual sounds of speech (the clicks, hisses, pops, etc) have been entirely removed, leaving only the pure formant tones.

The result sounds like strange electronic whistles but on careful listening it is perfectly intelligible (try samples at http://www.mrc-cbu.cam.ac.uk/~mattd/sine-wave-speech/).

Considering that speech is such a complex sound, it is surprising that so little information is actually vital to understanding words. However, there is a second set of information present in sine wave speech that is not often mentioned. Sine wave speech also retains the original timing and intensity of the formants as well as their frequencies. This, too, is clearly important in speech perception. So, any random noise that contains frequencies typical of formants and varies in intensity with timings similar to real speech will inevitably sound voice-like.

Another vital point to realise is that word recognition takes place in tandem with phoneme recognition, though we are never directly aware of either process. By the time we are conscious of hearing a particular word, our brain will have already decided what it is and passed it on to our memory fully formed and sounding perfectly normal. The word will sound the same to us whether it has been correctly recognised by our brain or not! So even when our brains make a mistake, we remember erroneous words no differently from a correct one, convinced that we heard correctly.

Research into word recognition has shown that people:

- recognise frequently-heard words more quickly
- recognise words more quickly than non-words (eg. 'sing' rather than 'sning')
- context speeds up word recognition (words that are expected come quicker)

Modern theories of speech recognition say that words are recognised by processing each phoneme in turn and eliminating possibilities as you go. So the brain has a set of possible words in mind even from the first phoneme. The first phoneme may fit several hundred words. The list will be reduced a lot by the second phoneme, as fewer words start with that combination. This carries on until there are sufficient phonemes heard to distinguish the word unambiguously (even if the word is not finished). In certain circumstances, previous phonemes may be re-examined to help speed the recognition. Context may also be used to speed recognition (ie. what word makes sense in that position in a phrase). From this, it is clear that mistakes can happen, usually at the word level, especially dealing with ambiguous sound sources.

The exact way that the human brain recognises formants is still being researched. However, the fact that formants can be recognised, despite varying from person to person and from time to time, points to the idea that we use frequency ratios. The ratio of formant frequencies (F1, F2 etc) making up a particular phoneme should always be roughly the same in ordinary speech, even though the absolute values vary. For voiced vowels, for instance, the formant frequencies are harmonics of the fundamental (voicing) frequency, F0. When our brains recognise sound frequency peaks at known ratios, and in timings and intensities typical of speech, they will usually start to hear words, whether they are real or not.

Formant noise

Consider what would happen if someone was played a random sound that contained various formant-like sounds but which was not real speech. If the person was convinced the sound was speech, their brain would try to identify formants in it by looking for familiar frequency ratios (particularly harmonics). All of this would be completely unconscious, of course.

Obviously, such 'formant noise', though voice-like, would sound like nonsense, at first. However, with repeated listening, certain chance formant combinations and sound intensity changes might suggest words (though different people might disagree on what the 'words' were). Indeed, there might be dozens of possible words suggested by one chance sequence of two apparent formants. The effect would be more convincing if there were noticeable changes in sound intensity, such as bursts of noise. These might, depending on their timing, suggest individual phonemes and words. Such changes in sound intensity could arise naturally, depending on the sound source, or from auto-gain circuits or audio editing, for instance.

What words, out of the many possible, would the listeners, albeit unconsciously, choose? Frequently-heard words would certainly be one strong influence. Another would be expectation or context. When presented with ambiguous and incomplete stimuli, people tend to be heavily influenced by expectation or suggestion. Thus, it would be relatively easy to turn random formant sounds (or chance sequences of them) into whole words and for those 'words' to make sense in terms of the circumstances of the recording. Once one 'word' was identified, the strong influence of context would come into play, so turning the rest of the sound fragment into an entire sensible-sounding 'phrase'. Surprisingly, rather than gobbledegook, we would expect reasonable words or phrases probably reflecting the context of the situation.

Thus, if an investigator on a vigil asks a question out loud to the sound recorder, they would, almost inevitably, receive a relevant 'reply' (after a few listenings). This could all be based around a few phoneme-like sounds and chance sequences thereof. There are specific reasons why this can happen and they are related to the way people process speech.

How we understand speech

Research has illuminated the, perhaps surprising, way we humans understand speech. Consider, for example, the ‘phoneme restoration effect’. This occurs when a phoneme in a word (or phrase) is replaced by (white) noise but is still 'heard' by the listener (ie. the brain 'restores' it). The missing phoneme sounds as though it is there but it is an auditory hallucination. Indeed, different phonemes are ‘replaced’ depending on the context of the phrase. Interestingly, the effect only works when the phoneme is replaced by random noise - if there is a simple gap with no sound, no replacement phoneme is heard. This demonstrates how random (white) noise can substitute for real phonemes when the context is right.

When you hear the phoneme restoration effect for the first time, it is extraordinary (try this web link:

http://www.acsu.buffalo.edu/~bmb/Courses/Old-Courses/PSY341-Fa2003/Exercises/Phon-rest/phon-rest.html). Even though you KNOW a phoneme has been replaced by white noise, you can still 'hear' the missing sound (usually a letter in the word) plainly, as if it was really there! The phoneme restoration effect shows what happens when you try to listen to speech in a noisy environment. Your brain 'fills in the gaps', essentially by making informed guesses, whenever the words cannot be heard properly. It’s a point to remember next time someone tells they are sure what they heard said in a noisy environment!

Another important bit of research to consider concerns the ‘verbal transformation effect’. If you hear a word (or short phrase) repeatedly, it will eventually transform until it appears to be a different, though similar sounding, word. The transformed words have a similar phoneme structure (so 'truce' may transform to "truth' when heard repeatedly). Even more interesting, research has shown that if you hear a nonsense word (ie. a series of phonemes that are not a real word) repeatedly, it is more likely to be transformed into something else than if you listen to a real word repeatedly. Indeed, the most easily transformed nonsense words are those that comprise phoneme sequences that are never normally heard in a natural language. The word transformations can end up as either real words or

Obviously, if you are expecting real words then it is more likely they will end up as real words. Listening to formant noise (random sounds that resemble speech) repeatedly can, thus, yield apparently meaningful words and phrases. Any 'missing phonemes' can be supplied by the phoneme restoration effect.

Making formant noise

Based on the above, a perfect formula for 'formant noise' would be a sound of speech-like frequencies containing at least two frequency peaks that happen to be in a frequency ratio typical of speech (particularly a harmonic relationship). In addition, some time gaps between intensity peaks (to produce 'words') and a noisy background (to allow the phoneme restoration effect to kick in) would be very useful.

Something else that can enhance the voice-like quality of formant noise is to restrict its overall frequency range, producing a tight 'spectrum envelope'. A spectrum envelope is the overall range of frequencies and sound intensities – see figure 5. Reducing the frequency range helps to enhance the illusion that the 'voice' is being produced by a single individual talking. Without this neat spectrum envelope, the noise may sound like lots of different voices contributing individual phrases or phonemes, which is less likely to fool the brain into thinking it is hearing speech.

You can reduce the frequency range of a recording by frequency (or FFT) filtering using audio editing software. Noise filtering (using the same software) may also accentuate any existing frequency peaks that happen to exist. This may increase the possibility that such peaks will be recognised by your brain as formants. This is why it is a bad idea to edit recordings to make them sound more 'voice-like'. You could be turning formant noise into a spurious voice.

Figure 5

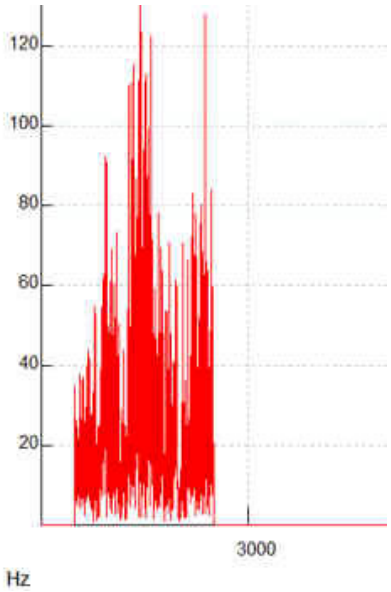

Fig 5: The overall area enclosing the waveform is called the spectrum envelope. The graph shows sound intensity (vertical) against frequency (horizontal).

Real speech not necessary

So, in summary, there is a possibility that sounds other than real speech can be interpreted as voices. Apart from instances of simple mis-hearing, there is also the possibility of formant noise. Such formant noise contains:

- frequency peaks in ratios typical of formants (especially harmonics)
- changing sound intensity resembling the timing of phonemes and words

It can be made more convincingly speech-like by:

- noise reduction software that emphasises existing frequency peaks
- filtering that restricts the frequency range

Some people will, particularly on repeated listening, start to hear 'words' in formant noise. The identity of these 'words' is likely to depend on context and expectation and will be rich in common words.

When examining apparently paranormal recordings for voices, the possibility of formant noise needs to be considered. So what are the likely sources of formant noise and other apparently paranormal sounds?

Sound sources: Background and forgotten noises

Probably the most important source of apparently paranormal sounds (recorded though not heard or noticed at the time) has to be ordinary background noise. This has already been discussed above in the 'Cocktail Party Effect'. As an experiment, try sitting in an ordinary, non-haunted, quiet room with a sound recorder running and note down all the sounds you hear. Then play back the recording and see how many you missed and see if you can identify them! Also, try it in a locked room with no one in it. Can you identify all the sounds?

Sound sources: Radio, electrical and magnetic interference

It is often said that EVP might be caused by unintentional radio reception. It is hypothesised that people might pick up words from fragments of radio broadcasts picked up inadvertently by sound recorders. While this is possible, and may happen from time to time, it seems unlikely to be a major source of apparently paranormal voices.

If you try sampling many radio stations, by moving the tuning dial on your radio, it is easy to see why. Many stations broadcast mostly music, rather than speech, these days. And if you did pick up a speech radio transmission on a recorder by mistake, the chances are very low that the words you would happen to hear would be particularly meaningful or relevant. Many EVP researchers report that the words they pick up are frequently relevant to their situation and even sometimes appear to answer their questions!

In contrast, general electromagnetic interference (not necessarily radio frequency), from electrical equipment, can definitely be a source of anomalous sounds. Most interference is likely to be heard as a vague hiss, hum or whistle and a variety of other odd noises only heard on playback. This could produce formant noise sometimes. Electrical interference affects the electronic circuits of the recorder directly, producing apparent noise on the recording, despite there being no sound heard at the time. Modern electrical equipment is designed to minimise such interference but it can still occur.

Some designs of microphone (including popular ones) can pick up magnetic field disturbances. Thus, a magnetic field varying at similar frequencies to sound could produce a recording directly via a microphone, despite no sound being heard. Such magnetic field disturbances need to be quite strong, however, for this effect to occur. In a lot of cases it is likely that the source of such a magnetic field disturbance (eg. a motorised device) would probably produce real sound as well, giving a clue to the source of the anomaly. Wireless microphones are prone to picking up unwanted radio transmissions and should be avoided in paranormal research.

As an experiment, try using a cell phone near your sound recorder (within a metre or so). When you play back the recording you will probably hear the musical tones as the phone contacts the network. Then, when you make a call, you may well hear a buzzing sound from the call itself. You won't be able to hear the words being spoken (the signal is digital and encrypted and cannot be decoded by your recorder) but you will hear what at least one kind of electrical interference sounds like.

Sound sources: Real voices!

If you record real human voices at a distance, it may be difficult to work out what they are saying (even when heavily amplified). Naturally, such voices will contain formants typical of voices. Unable to understand what is actually being said, listeners' brains may re-interpret these formants to make new 'words'. Effectively, such distant voices could form 'formant noise', capable of re-interpretation as different words from those originally spoken. In the figures below we see what happens when a voice becomes increasingly distant from a recorder.

Figure 6

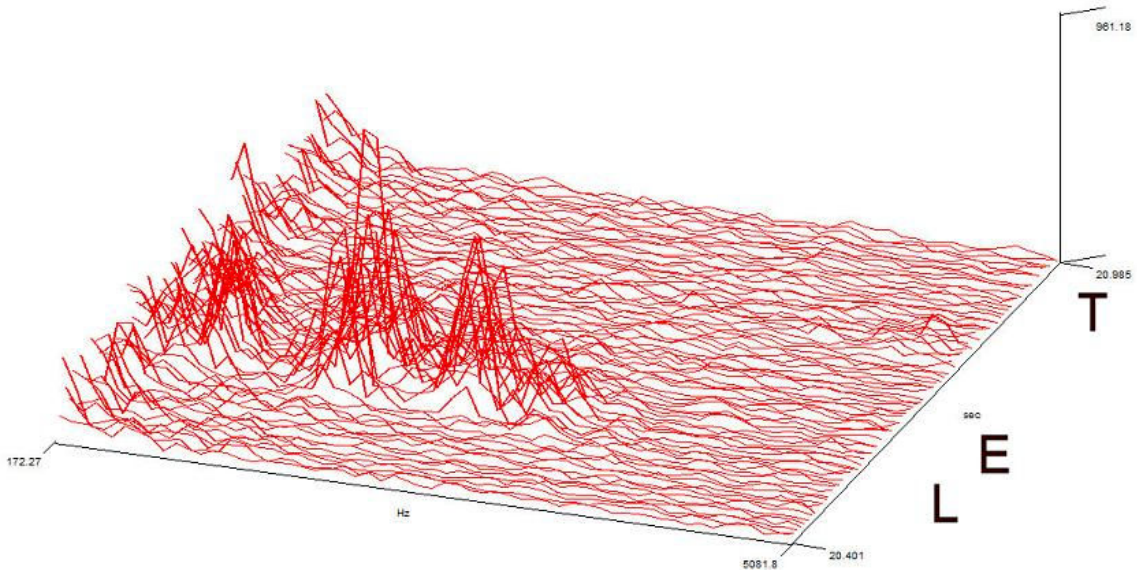

Fig 6: In this frequency diagram, the word LET is spoken again (ordinary human speech). However, this time the voice is more distant (a couple of metres from the recorder). Compare this with figure 4. Though the E sound is still distinct (though much less intense) but the L and T sounds have vanished!

Figure 7

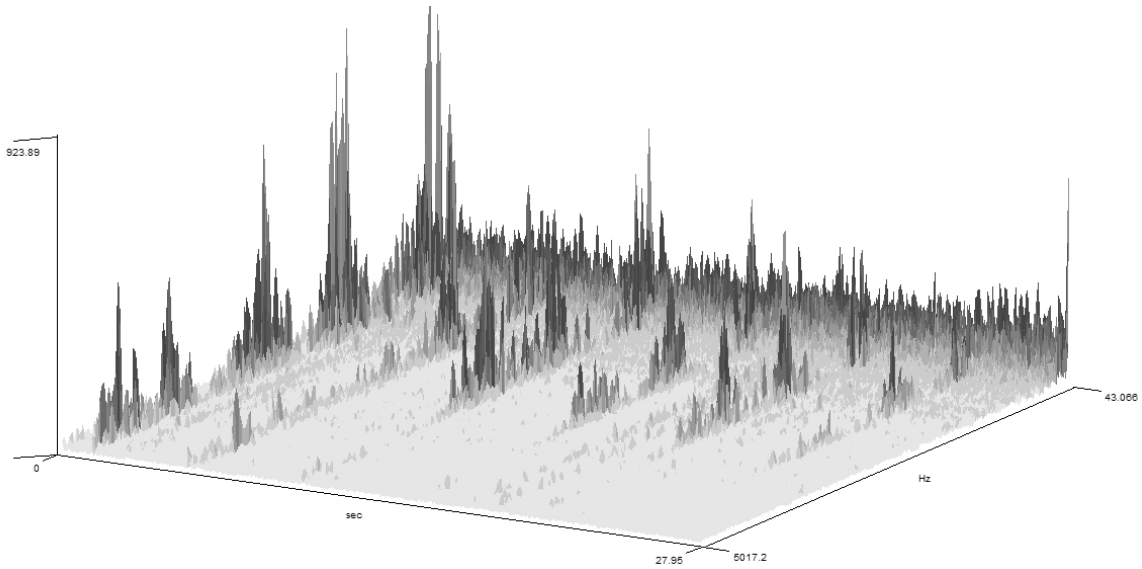

Fig 7: The figure above shows the frequency spectrum as the word LET is said out loud (ordinary human speech) repeatedly at increasing distances from the recorder. Time is the bottom axis, increasing rightwards (0 to 28s). The right axis is frequency, increasing towards the front (from 45 to 5000 Hz). The vertical axis is loudness or sound intensity. The word LET is said six times in all. It appears as the parallel lines of peaks coming towards the front like chains of mountains poking out of clouds. When the word LET is first said (far left), there are obvious high peaks (formants) up to 5000 Hz (good enough for voiceprints!). As the speaker moves further away (going right), the number of formants gradually diminishes. They also shrink in height until they are no higher than the low frequency background noise forming a 'wall' at the 'back' of the graph. The higher frequency formants (above about 3000 Hz) vanish completely. In addition, the lowest frequency formants are lost in the background noise. Speech recorded at a distance will have few formants, mostly in the region below 3000 Hz.

Research has shown that (as you might expect) speech intelligibility drops with distance from the speaker. In particular, as can be seen above, consonants suffer more than vowels. This loss of consonants has a profound effect on speech intelligibility because they are more important than vowels in understanding words accurately. Indeed, the loss of consonants is used in the ALCONS (Percentage Articulation Loss of Consonants) formula as a way of measuring speech intelligibility. Intelligibility is also affected by the level of background noise and, when indoors, the reverberation time of the room.

Reverberation time is the time taken for echoes of an original sound source to fade away. It is typically high in large rooms. A long reverberating time can affect speech intelligibility because the echo can be strong enough, for long enough, to interfere with the original sound. Many vigils take place in old houses and buildings with large rooms. Speech affected by excessive reverberation could be difficult to understand and may be interpreted as paranormal (or produce formant noise).

Sound sources: White noise

Many other sounds, apart from speech, contain formant frequencies. EVP researchers sometimes use 'white noise' to stimulate apparent voices. Pure white noise would seem to be an unlikely source of formant noise because it contains all frequencies equally with none standing out. However, there are many white noise-like sound sources which are often reported to produce EVP. These may include sufficient random irregularities to give rise to suitable formant frequency peaks from time to time. Given the role that white noise plays in the phoneme restoration effect, it should come as no surprise that it is a useful source of apparent voices.

There are various sound sources that sound superficially like white noise that you might record on vigils. These include the wind, some electrical equipment (particularly anything with a fan), flowing water, radio noise, etc. The following spectrograms all show 2 seconds of various 'white noise' sound sources between a few Hz and 5000 Hz.

Figure 8

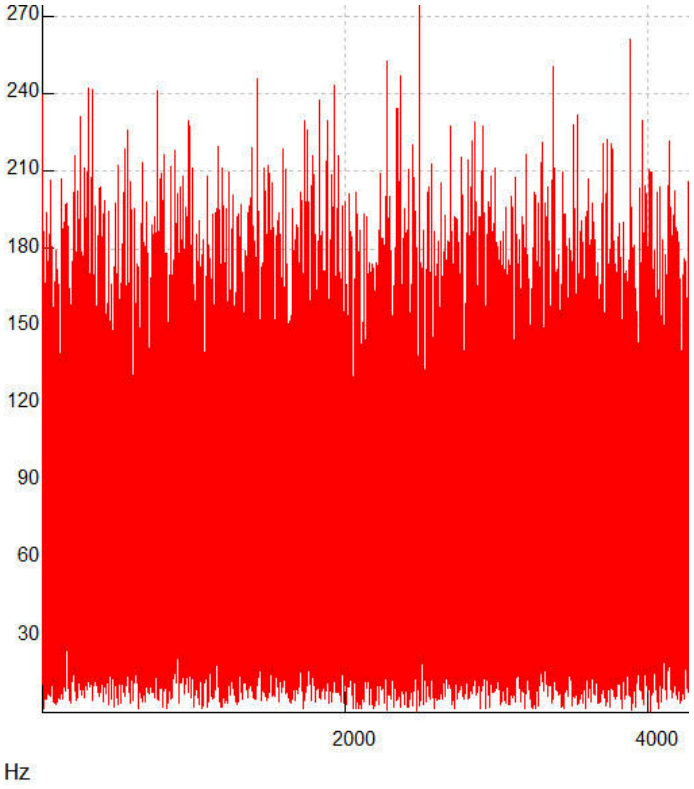

Fig 8: A spectrogram of pure, electronically generated, white noise (frequency scale along the bottom and sound intensity up the left side). All frequencies are represented equally so that there are few random irregularities likely to stand out as formant frequencies.

Figure 9

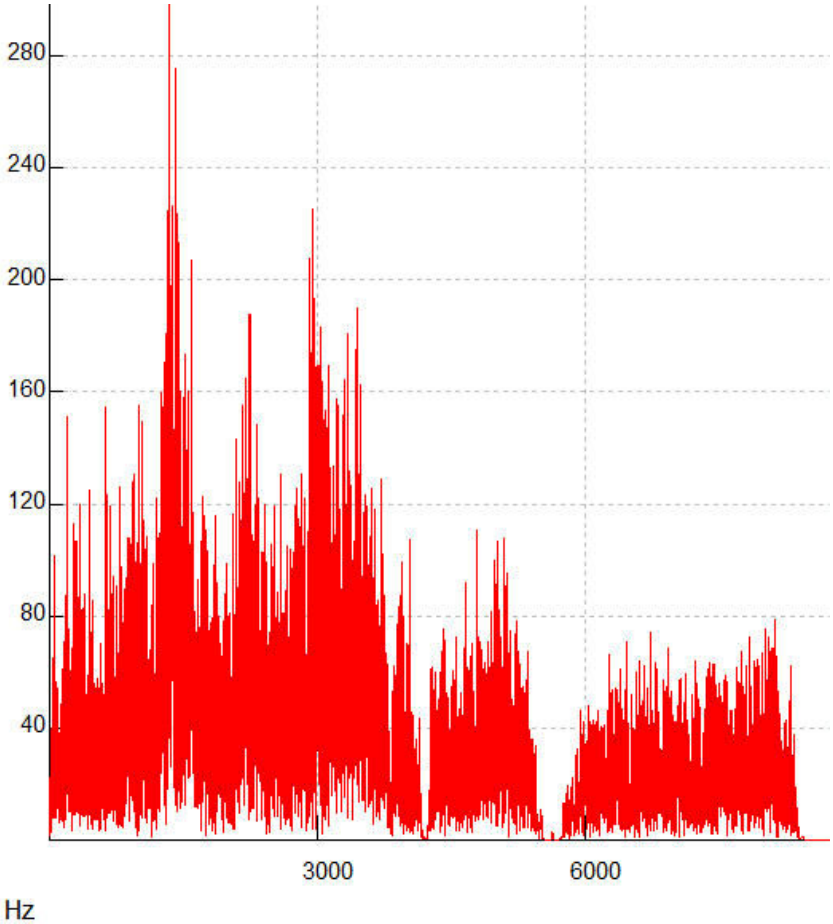

Fig 9: This is similar to fig 8 except that it shows radio 'white noise'. It was recorded by tuning a radio between stations, a method used by some EVP researchers. It is certainly not white noise in the strict sense (compare it with true white noise in fig 8). There are notable peaks at the 1500 Hz and 3000 Hz frequencies as well as a more irregular string of peaks around 2200 Hz. These peaks may be suitably sharp and in a frequency ratio to produce formant noise.

Testing voices

Bearing in mind the foregoing discussion, it can be very difficult, when faced with a sound recording, to decide whether it is really a paranormal voice or just an auditory illusion. So what can be done in practical terms?

One thing to try is to break down phrases of apparent voices into their constituent words, isolate them in recordings, and play them individually. Do they still stand up as words on their own? If the 'words' are real, they should still sound like parts of words when broken down into bits. If they are illusory, the individual parts are unlikely to sound right.

Another thing you can try is to listen to the individual words and allow yourself the 'luxury' of repeating exactly what you hear, even if it sounds like a nonsense word. Does a nonsense word (like 'srin') actually fit better than your original choice (like 'skin')? Your brain will try to 'correct' nonsense words (particularly if you listen repeatedly) but if you try hard you may hear something different to what you expected.

Try looking at the frequency analysis of your recording. Are all the expected phonemes present or are any 'replaced' by random noise (phoneme restoration)? Try recording yourself saying the same words and then compare the frequency analysis of your real words with the sample you're examining. Are all the expected formants present and are their frequencies distinct or do they run into each other? This isn't a definitive test as formants can become degraded by distance or noise. If, however, the 'speech' is loud and clear, the formant structure ought to make sense if it is a real voice.

Other things you can do include:

- playing your voices to someone with no interest in the paranormal without telling them your interpretation
- selective frequency filtering (see below)

There are many other tests you could apply. The most important thing is to keep an open mind and follow the evidence rather than your personal theories.

Assessing content

Assuming that you are satisfied that you have recorded a voice; there is still the question of actual word content to be considered. Does the apparent vocalisation make any sense as real words? Do the words make any sense as a message?

EVP researchers often say that their messages make sense within the context of their recording, even though they can appear meaningless or cryptic in isolation. Of course, expectation and the verbal transformation effect are important in determining content of ambiguous sounds. If you listen to the same words repeatedly (whether a normal real voice or EVP sample) you will hear the words shift around between similar sounding alternatives (sometimes including nonsense words).

If, as sometimes happens in EVP research, you are told what words you are going to hear in advance, it is no surprise when you hear the expected message - a clear case of suggestion. Even suggesting alternative interpretations will bias the judgement of listeners. Indeed, if you listen to an ambiguous voice repeatedly, while reading a list of alternative possibilities, you may well hear each interpretation in turn! The obvious lesson is to avoid telling other people what to expect!

While assessing content is always going to be a subjective process, there are things that can be done to overcome the more obvious biases. Try selecting third-party judges who have had nothing to do with the experiment or investigation. Ideally, get people who have no experience of, or interest in, EVP or even the paranormal.

The following is a suggested protocol for getting third parties to judge your recordings.

Prepare a single recording for others to judge, containing a number of EVP samples, each interspersed with other recordings of normal, real voices and non-voice sounds (to act as controls). The normal voices should be those of third parties unknown to the judges. Put silent gaps between each sound and introduce each one with a number to identify it.

Ask your judges to say, in each case, what they think the sounds are and, if they are voices, what they are saying. All the sounds should be of similar duration to the EVP samples. Some of the normal, real voice messages should be sensible words or phrases while others should be nonsense words or phrases.

The reason behind this approach is to reduce psychological bias. By separating your EVP samples and not repeating them in isolation, you reduce the verbal transformation effect. By including random sounds, you give your judges psychological 'permission' to say your samples might be random noises, if they think they are. By including sensible and nonsense voice messages, you also give them 'permission' to say that, though your EVP sample sounds may resemble a voice, the message makes no sense, if that's what they honestly think.

Natural causes to look for

By way of summary, here is a brief account of the sort of natural causes for anomalous sound recordings that you should be looking out for:

- faint sounds that were either not noticed at the time or simply forgotten - don't forget that the AGC will amplify very faint sounds during quiet periods and a directional microphone may pick up noises from small areas preferentially that you may not notice
- background sounds - it is easy to get used to repeated or continuous background sounds (such as electrical equipment like fans and pumps, or the wind) that can be quite loud - they may come as a surprise when you play the recording back as sound recorders don't get used to sounds (though the AGC may exaggerate them)
- electrical or radio interference - this would only be noticed when the recording is played back - it doesn't have to be obvious radio transmissions but could just be hums, buzzes, whistles - the AGC may tend to amplify these as well
- multiple sources of sound may come together, by chance, to form apparently novel sounds, particularly in association with 'background' sounds
- real voices so distant and faint that the words cannot easily be made out

If any of these sound sources produce a noise containing frequencies typical of formants and vary noticeably in volume ('formant noise') they are likely to sound like a human voice but the 'words', if any, may be difficult to understand. Repeated listening may produce reasonably robust 'words' (though different people will probably disagree about what they are). The content of these 'words' is likely to be dominated by common words and the overall 'message' (if any) will be strongly affected by expectancy (ie. it will probably appear relevant to the situation).

Of course, once you have eliminated these natural causes, there is always a chance that you have a genuinely paranormal sound recording.

Selective frequency filtering

How can you tell if a voice is genuine or just an auditory illusion caused by 'formant noise'? For your brain to pick up formants, whether real or illusory, it looks for particular relationships between two or more frequency peaks. In formant noise it is unlikely that the number of peaks in a suitable ratio would exceed two!

This suggests a possible way to test for illusory voices in formant noise.

Assuming you have the software available, you need to selectively filter out bands of frequencies (sometimes called FFT filtering) from your sample. The idea is that this will probably eliminate one of the two frequencies in the spurious relationship, so breaking the illusion.

The best way to select which frequency bands to eliminate is by examining the spectrogram. If there are two or more obvious bands of more intense sound at particular frequencies in your recording, try filtering out each in turn. A real voice, by contrast, should survive such treatment.

For instance, in figure 9, you can see there are peaks of higher intensity sound around particular frequencies. The peaks are around 2200-2600 Hz and 2900 - 3200 Hz. So, to test this sample you could filter out each of these bands in turn to see if this eliminates the apparent voice.

If you cannot easily identify candidate frequency bands to eliminate, just try using a step method. For instance, remove 0-400 Hz, then 400-800 Hz and so on in turn. In each case, you leave all other frequencies alone.

Summary

Searching for paranormal voices, or EVP, is more difficult than it might at first seem. As well as eliminating real voices, unheard or forgotten at the time of recording, there are other, more insidious, natural causes to consider. In particular, there is the phenomenon of ‘formant noise’.

It is also perfectly possible to hear 'words', that are not really there, in formant noise, because of the way the brain interprets speech. Specifically:

- sine wave speech demonstrates that all that is necessary to understand words is the presence of relevant formant frequencies with sound intensity variations
- the phoneme restoration effect demonstrates that when certain sounds within words are missing, and their place taken by random noise, the brain will 'insert' the appropriate missing sound to produce apparently complete words
- formants are recognised by the brain using frequency sound peaks in a frequency peak ratios typical of speech (particularly harmonics)
- such frequency peak ratios can occur by chance in random noise ('formant noise')
- as few as two formant frequencies can produce a phoneme which the brain will interpret as part of a word

Someone listening to formant noise may 'hear' phonemes that are effectively manufactured by their brain. Given the random, ambiguous nature of the sound source, the brain can turn this collection of apparent phonemes into complete words and phrases that sound perfectly real to the listener (particularly if repeated – the 'verbal transformation effect'). This is a 'top-down' process, so that the exact phrases that emerge, though constrained by the apparent phonemes, are nevertheless determined by the listener. Suggestion can have a powerful effect in determining this message content. In addition, audio editing, such as noise reduction and filtering may actually make random noise more like formant noise.

It may be possible to test for the presence of 'formant noise' by selectively filtering out certain frequency bands. In doing so, the spurious frequency peak ratios that make the apparent formants will be broken, so destroying the auditory illusion.

Readers may be interested in an EVP Gallery where many of these points are illustrated. It is at http://www.assap.org/newsite/articles/Analyzing%20EVP.html.

Article: Trigger Objects - A Valid Investigation Technique?

Article:
Trigger Objects – A Valid Investigation Technique?

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Introduction

It is my contention that the Trigger Object experiment, as often seen in use on paranormal investigations, is not as simple a technique as it is made out to be. There are numerous variables to consider before placing an object in the hope that something happens to it, to demonstrate that there is a paranormal presence in the so called "Haunted" locality.

Currently, and all too often, when employing the Trigger Object experiment a cross or crucifix (or other random mundane object), chosen on the basis that it has been seen to be employed elsewhere – on television perhaps, is simply placed down upon a table. The investigator, with no more effort employed on his or her part, then goes elsewhere to conduct an investigation, only to return later in the fervent hope that it will have moved.

Although perhaps the perceived methodology to employ, I would argue that there is little point in simply placing any randomly selected object down on a table and return later to note any movement without eliminating all causes for unintentional fraud, without monitoring the experiment and without background research beforehand.

In this paper I hope to demonstrate that the Random Trigger Object Experiment which may through luck produce the desired effect, is not the most effective method to conduct this particular experiment.

The concept of the trigger object has been around for a number of years, it is something that has been written on in many recent paranormal investigations, but unfortunately it is usually employed without much fore-thought regarding the reasons why it may work nor, more importantly, why it so frequently fails. The problems to consider may be broken down into the separate categories of choice of artefact, placement of artefact, method for the detection of movement, and finally most and finally most important of all the type of haunting manifestation. But to be perverse, as is the nature of the paranormal itself, let us start in reverse order.

The nature of the paranormal

Frederick Hill writing over half a century ago shows the attitude towards ghosts at that time with the comments
"People nowadays know that there are no ghosts, but most people like to hear ghost stories, even when they know the tales can't be true

This attitude prevalent 50 years ago is fading, for as the local newspaper reports are showing, it is becoming more socially acceptable to declare that a ghost was seen or a building is haunted. But a part of his words still hold true, people do like to hear or read about ghosts. I particularly like one tale quoted in Charles Harper's classic "Haunted Houses" where an unnamed Gentleman enquires of a Madame du Deffand *"Do you believe in ghosts ?*" to which the reply was *"No ….but I am afraid of them".*

Ghostly manifestations have been witnessed from at least the time of the archaic Greeks, whilst in England the oldest manifestation seems to be the Bronze Age horseman associated with the barrow on Bottlebrush Down near Wimborne St. Giles in Dorset. Ghosts have been variously interpreted as harbingers of doom, messengers from the gods, or the spirits of the dead, or in the case of the extreme sceptic a complete fabrication. Once the evidence has been sifted for obvious fraud, exaggeration hallucination, telepathy and all the usual caveats that must be applied to our study, and those factors eliminated as a possible reason for the witnessed phenomena, what we are left with, is, I firmly believe, a Ghost.

This then opens "another can of worms" for there are so many aspects of the phenomena, which are so cavalierly grouped together under this insufficient banner. I have usually found that in the cases where a genuine haunting is occurring, the phenomena may be roughly divided into two types, the non-sentient and the sentient forms.

Non-sentient apparitions

Externalised Non-sentient apparitions are basically a recording of a specific event, from a specific time, upon the local environment which has a physical presence.

This event it would appear would have to been of a significant intensity of emotion, anger, love, betrayal or fear etc. to have saturated the environment with sufficient charge to record the event. It is much as Playfair (1985: 238) asserts:

> *"that when people are in a heightened state of crisis or heightened emotion - pleasant or unpleasant- they can unwittingly record a kind of tape that certain people can play back."*

The mechanism of the replay may be a constant, and the apparition is replaying until like the clockwork toy it runs out of it's kinetic energy and ceases, but one which is only visible under specific circumstances. It is however likely that this particular phenomena continues as noises, cold spots and finally as the feeling of "a presence" until the energy levels fall below that needed for even these forms of materialisation.

Alternatively a second possibility exists that the apparition only occurs when a trigger is given to effect the playback, much like pressing the replay button on a VHS or DVD player. The trigger may be of a diverse origin, and we do not know of course whether playback apparitions occur when no humans are watching and thereby providing such stimuli.

One such example of this may be found in the Highwayman haunting Kiverton Park in Rotherham, who is mentioned in Liz Linnahan's (1997) excellent north of England ghost trail. The account is located on an ancient and relatively isolated former trade route which runs for around 2½ miles from Kiverton Park Station to the village of Whitwell on the Derbyshire border. From this area there have been numerous and fairly regular alleged sightings of a phantom Highwayman who has a habit of materialising in front of moving cars. This figure is commonly described as being mounted on a dark coloured horse and wearing a tricorn hat and a cape. The figure quickly darts from left to right, across the road, one silver stirrup flashing briefly, before vanishing into the fields and foliage.

Linnahan notes that witnesses have asserted the appearance seems to be triggered by car headlamps, and the sightings have only been noticed in areas without street lighting and after dark. One unfortunately un-named group, are alleged to have triggered the apparition by driving a car up and down a section of the road.

With many individuals describing the same apparition, and it being seen by more than one individual at a time, and it being triggered by a specific event, this fits neatly into the first category of Non Sentient Replay.

Other examples of this replay may have been witnessed at some, but by no means all, battlefields. Edge Hill fought in 1642 is quite a famous example with the King (Charles II) even sending a party of commissioners to investigate the tales. Otterburn in Northumbria has accounts of soldiers in costume of the period being seen crossing the road. Further examples may be cited at Flodden Field in Northumberland, Marston Moor in Yorkshire, Sedgemoor in Somerset, Tankersley in Yorkshire, Naseby in Northamptonshire, Battle in Sussex and many, many more.

Far from being actual spirits taking up arms against each other once more, these spectral warriors seem to take arms only when the environmental conditions are right. Perhaps much in the same way that a tape recorder records the magnetic variations on a magnetic tape, in alternating bands of high and low density. The playback of the Non-Sentient phantasm is akin in many ways to the use of a video recorder. The signal is recorded onto the tape, and when the playback button is pressed the picture is replayed on the screen, as long as there is sufficient energy available for it to do so. Whilst the video recorder works upon the utilisation of electricity, an energy source with which we are all familiar and most of us understand, being caused by the excitation of electrons, the video will only work when the plug is placed into the wall socket and the switch turned on: even here there are variables to consider. The energy source for the apparition is not as yet known, neither are the variables needed to be in place for the event to happen.

Another alternative of the Non Sentient is the Stone Tape variety of haunting. This is where the apparition is not real in the physical measurable sense, but merely a construct or an hallucination created by the mind based upon external stimuli. The phrase Stone Tape was coined following a BBC Tv drama shown in 1972 (and subsequently released on DVD). My friend Dr Paul Lee has written an article on his website that states:

> *"a group of scientists realise that the image and sounds of the ghost is stored materially in the fabric of an old room and that people sensitive to the recording can play it back in their heads- a fascinating idea since it presupposes that everyone's reaction to the 'ghost' is different- "like eyesight or hayfever"*
> *"The Stone Tape" theory relies on no 'external'* ghost - *everything is perceived in the mind, and nothing can be recorded or analysed on their equipment. Such a 'ghost' would follow a predetermined course of action- walking the same path as in life"*

If it did indeed had a former life, and was not a complete mental construct based upon external stimuli such as weak, complex EM fields, sub-sonics and infra sound, upon a mind subconsciously interpreting the signals of the past from the surroundings. In this case the apparition that is reported to the investigator is completely based upon the witness' perceived appearances and attitudes of historic periods and the people of those periods. The Apparition only has a presence to that witness, to whom of course it is real.

Sentient Apparitions

Sentient Apparitions display awareness of their surroundings and are potentially therefore able to interact. From well over a century of scientific study evidence has been produced from witnessed phenomenon which strongly suggests that some apparitions are indeed spirits, a contention of spiritualists for a considerable time.

I remember an interview with a chap called Alan from Kingsdown (near Deal) in Kent, who related his experiences in Worth Churchyard in the 1970's. Having cycled to Worth from Sandwich a short distance to the south, and leaning their bicycles against the churchyard wall by the gate, Alan and friend started to throw sticks into a particularly fine Horse Chestnut tree to knock down conkers. Their exercise was interrupted abruptly by a voice from behind them stating what a mess in the churchyard that they were creating; they turned and saw that it was the vicar. At least at first glance they assumed it was the vicar, then they realised that the figure was partially transparent and fading. Needless to say they ran.

A recent book by John Dening (1991) in which he writes up investigations he conducted in the 1960's, gives ample food for thought when considering that some ghosts are indeed the spirits of the deceased who have become trapped in a time-less nether world. The spirit rescue group, over a period of time succeeded in persuading the trapped spirits to leave.

A clear cut example of a sentient ghost comes from the pages of The Ghost Book of Charles Lindley, Viscount Halifax, from a letter dated July 10th 1917 from a correspondent identified as Charles G.S on the topic of Admiralty House in Queen St. Deal. This building was, unfortunately for me as I used to live very near to Deal, demolished in 1936. The accounts from this house remain fascinating reading and it was reported to be haunted by a female with long hair who rustled as she passed through the upstairs rooms or the magnificent stairway. The account in Lindley (1994) details the following :

"In the middle of the night I awoke, feeling that something uncanny was about me. Suddenly, there appeared at my bed-side the phantom of either an old man or woman, of dreadful aspect, who was bending over me. That I was wide awake is beyond all question. I at once became cataleptic, unable to move hand or foot. I could only gaze at this monstrosity."

Some 20 years later the witness again stayed at Admiralty House, again the apparition appeared to him, but showing his courage he watched and described the phenomena as it happened before him:

"once more, in an exact repetition of my feeling twenty years before, I was conscious of the presence of something unseen in the room. I pulled myself together and said to myself, - This time I will see this thing through and definitely prove whether my former experience was an hallucination and whether there really is such a thing as a ghost. I am wide awake beyond all possibility of doubt and only too conscious of a raging toothache.

"The thing again spoke to me mentally: 'Look round. Look round.' I now had that unaccountable feeling of horror which all accounts of such manifestations agree in declaring are produced on such occasions. Turning round, I saw in the corner of the room facing me a curious column of light evolving spirally like a whirlwind of dust on a windy day. It was white, and as I gazed, it slowly drew near to me. Here I am again!' the thing kept repeating. I stretched out my hand for the matches at my bedside. As the thing got gradually closer and closer to me, it rapidly began to take human shape. Under my eyes and within my grasp it assumed that very figure I had seen twenty years before. There was no doubt whatever about this, and having reached the limit of my endurance, I shouted out, 'Who's that?' No answer coming, I hurriedly struck a match and lit a candle."

In this example clear evidence is produced of a personality behind the apparition, not only a (rather black) sense of humour was exhibited but also an apparent memory.

As a last example I will use the The Ship Inn at Sandgate, where the landlord tells of a ghostly presence - which he refers to as The Fish Lady. He claims that the presence of his 'ghostly visitor' can be felt most often in the area outside the kitchen.

This particular ghost is quite specific in her likes and dislikes – if she disapproves of a particular visitor she lets him/her know by giving him a sharp dig in the back. Many of the staff and customers have seen The Fish Lady, who is invariably described as being dressed in a distinctive Victorian costume. One sighting of her is alleged to have occurred at closing time when the barman was checking that there was no one left in the building. Finding it empty he returned to the bar where another member of staff asked him "who was the person she had seen him standing with (she had been monitoring the security cameras)" Nobody could have let themselves out as the keys to the locked door had been on the bar in her sight the whole time!

Once again both a sense of humour and a sense of temporal understanding are displayed which suggests that this is apparition displays sentience.

The revenant, would seem to be a spirit passing through or transiently revisiting their former abode, or a place that they greatly cared for. An interesting probable revenant was the case of Douglas Jardine, whose apparition was seen on 19 June in 1958 by Col. D. Pritchard in the pavilion bar at Lords, before the start of the England—New Zealand test match. As John and Anne Spencer write:

> *"...Standing alone at the end of the bar, just a few yards from Pritchard, was Douglas Jardine (probably most famous for the 'body line' cricket tour). The two were well acquainted and Jardine was, in Pritchard's words distinctive and impossible to mistake. The two apparently caught each other's eye and raised glasses to each other over the distance. Shortly after, Pritchard finished the conversation he was having and went over to speak to Jardine but could not find him. Just before the start of play that day the loudspeaker announced that Jardine had died the previous day in Switzerland."*

The Failure of the Trigger Object Experiment

Too often there is an automatic assumption that the nature of the activity and/or apparition has been generated by a discarnate intelligence, in short a spirit. This assumption is flawed from the outset for it takes no account of the of Non Sentient apparitions. And yet the answer as to why this assumption occurs is simple: the argument which expounds that every case of an alleged haunting is manifested by a spirit, has been proposed in popular sources to provide a simple unilateral, un-complicated, answer that has popular appeal.

Complicated answers complicate a story, and the story - that is the folklore of a haunting, is a pre-programmed understandable facet to our culture. We take the facts (or those that fit) and from these we create a tale to fit – whether it does or not: for proof of this look at all those ghosts book where there are the elements of a ruin, a nun or a monk reportedly seen flitting around said ruin, and the story of an illicit affair springs to life to account for the haunting. The next step is to assign a personality to the said nun or monk and an instant spirit in perpetual torment is created.

This does not however say that I do not believe in the existence of the continuation of the personality beyond physical death, there is far too much evidence collected over the past 100 years (and more) that only the most extreme materialistic die hard will not at least admit the possibility. It is truer to say that there are far more mechanisms grouped under the paranormal banner, of which the existence of spirits is just one.

For the purposes of the Trigger Object experiment, its use can only be fruitful if employed in a location where the activity of a discarnate intelligence has been observed. Unfortunately through the assumption that every haunting is caused by a spirit, in many current cases the Trigger object has resolutely remained inert on a table top. The reason for this is quite simple; any paranormally derived movement achieved by the experiment can only be accomplished by a sentient entity. The Non Sentient Apparition is a mere replay of the past and the Stone Tape Apparition is a mental construct; neither will possess the intelligence to reason that the object should be moved, nor the ability to kinetically move it.

What object to use

Assuming for a moment that a spirit is the cause of the haunting at the location under investigation, and that therefore the Trigger Object Experiment is valid for the location, the next part of the equation to consider is "what is the best object to use in this instance?

For, as I will often contend, if the chosen object is not of interest to the otherworldly occupant, then nothing will happen in the experiment either. I am sure that if I, returning as a spirit saw a key or a cross on a table, I would have no interest in it at all - let alone wish to move it. I get a bit annoyed (frustrated is a better word) when I read that "we set up a crucifix" or "a key" or some other completely moronic artefact and they expected a sprit to move it. And yet when asked why they had chosen the object they had set out as a Trigger object, too often the answers demonstrated no process of logic nor research but a simple copying of what they had witnessed on television programs or the methods of other

groups.

A sound method of employing Trigger objects first requires a modicum of research into the sightings, sounds and kinetic activity which has already been experienced at the location. From this base an educated guess as to the best object to use and the right place to put it may be attempted.

For instance, if the alleged spirit is that of a child, then pick something that a child might wish to play with, why not use a cuddly toy or something just as recognisable and applicable : a caveat though - please do not consider using objects which have a tendency to move on their own – balls or marbles for instance. It also seems logical that if we chose a colourful artefact to be used, something both applicable and easy to spot, then something may happen.

Take the time to write Instructions

Another point to consider, If we are dealing with a spirit, is how can we be sure that this particular spirit understands what we wish the outcome of the experiment to be; that is the movement of an object on a table? How can it be sufficient to place a random object on a piece of paper on a table top and expect something to happen? If I walk into a room and notice something on a piece of paper on a table, apart from perhaps a passing interest and cursory inspection, what is there to intimate that I should handle or move the object?

And yet this is the scenario presented time and again in paranormal investigation reports, and one which I would argue is largely why so many such experiments fail. Simple courtesy would demand that the spirit, whether the reader believes in spirits or not, should be asked. One simple thing that seems common sense if not essential to the experiment, would be to write instructions on a piece of paper beneath the object, in plain view and in large clear writing, what outcome you would like: i.e. please move this. At least then the required end outcome is clear, that it is an experiment to demonstrate the existence of the paranormal by having something moved, and that it is not just another object placed upon a table.

Of course, free will can never be predicted, but at least by writing instructions we are illustrating what we hope to achieve.

Positioning of the Experiment

The positioning of the experiment is just as important as the choice of object, for, should the object be placed on a floor or in a corridor or a staircase then the chances of fraud (animal or investigator) increases and the likelihood of a discarnate entity noticing it decreases.

A Trigger Object Experiment was conducted during one of my investigations at Killhope Mine, County Durham, which took place on the night of the 30th of September 2005 in aid of the charity Action4Disability, The experiment was placed in the Middle room (the Mining and Mineral display), a location not being used as a part of the investigation and one which had a convenient solid bench which was not subject to movement from floorboard vibrations.

Believing that a spirit was indeed in residence (based upon personal information gathered from one particular employee at the mine) the choice of a suitable Trigger Object was thoroughly discussed prior to the investigation. It was decided that a tally once used to mark the numbers of men who had descended the mine at any one time could be a good object to use. It would be an object that would be familiar to any spirits passing through the area, and hopefully of sufficient interest to be noticed. We were fortunate enough to borrow three such genuine tallies from Killhope mine museum prior to the investigation.

Without wishing to cause mess or damage at the mine, the Tallies were placed on sheets of lined paper, the tally was drawn around, and “Please Move This” was written beside each of the tallies. Immediately prior to the investigation the experiments were laid out in the Mine Office, where an investigation was being conducted, and in the Middle room which remained empty for the duration. The idea behind this was to assess the effect of having investigators in the area of the Object and compare this to a similar experiment in a locked off area. The other area under investigation was the Mine Shop, the cramped living accommodation for the miners where no Trigger Object was placed.

Photo 1: Middle room with Experiment on extreme left of bench

With everyone settled and ready for the first phase of the investigation, a general walk around to check that all was in place was conducted. It was at this time (21.10) that Geoffrey (generally a sceptic) somewhat quietly and sheepishly reported seeing the figure of a tall man in long johns wearing a pointed hat seen standing on a bed in the Mine Shop. It was also when, outside the building, a brand new & fully charged torch battery drained unaccountably (this occurred a further 3 times during the night, and everyone reported that their torch batteries did not seem to be lasting as long as usual). It was also discovered that the digital camera refused for a while to work in the area outside the Mine Shop and Office. In addition a Nightlight Candle was found blown out ; the curious part being that the wick had been pulled completely out of the wax.

In the Middle room (the Mining and Mineral display) at 21.21 one of the tallies was discovered moved, and yet nobody had been in the room since they were set in position. The Tally was photographed and the experiment reset.

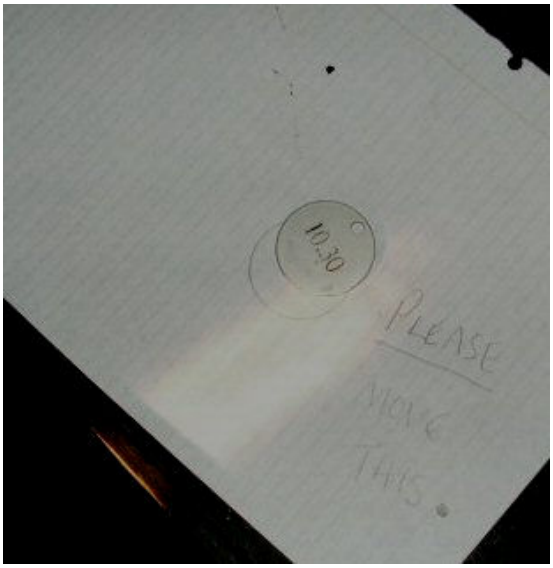

Photo 2: The Tally in The Middle Room at 21.21

At the end of the second session of investigating the experiments were re-checked. Thus at 01.15 the Tally in the Mine Office was found to have moved considerably from its marked position on the desk. Unfortunately this proved impossible to photograph as the camera malfunctioned, with the batteries unaccountably draining, and having gone to the rest area and replaced the batteries, I returned to find that some helpful soul believing I had neglected to move the Tally back to its starting position after photographing had done this for me.

The Tally in the middle room had moved to an even greater extent than it had before, fortunately the camera worked fine here.

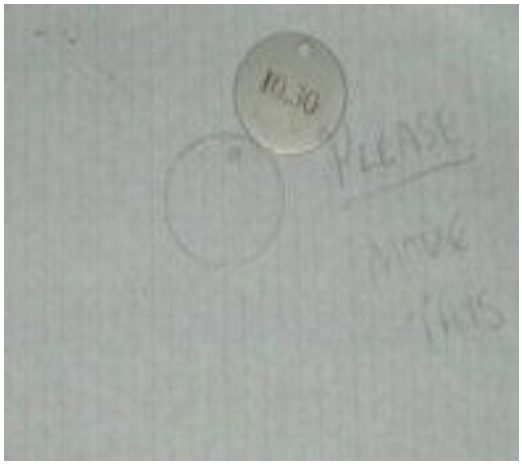

Photo 3: The Tally in The Middle Room at 01.15

In my experiment, not only was the tally appropriate to the investigation at hand, but it was clearly labelled asking exactly what I wished to happen. In this case I had written “Please Move this”. The result was that by (what I consider to be) paranormal means the tallies were moved in both the rooms whether there were investigators in them or not.

What I do wish, however, was that I had a camcorder monitoring the event so that fraud, rodents and vibration could be completely eliminated as causes. I plead that it is the curse of finite resources (as always) to account for the lack in this case.

Camcorders

Unfortunate as my lack of funds is, I still assert that a camcorder monitoring any Trigger Object experiment is useful, if not essential, to avoid all claims of fraud and to eliminate natural causes for any observed movement. To illustrate, I offer a cautionary example from County Durham:

A certain North East paranormal group was at the museum in October 2004 supposedly investigating the moving of pieces on a draughts board at night after the museum closed. The investigation rapidly strayed from the Mine Shop to other parts of the mine complex when nothing was perceived to be happening. In consequence no conclusion was offered for the paranormal movement of the draughts pieces, nor was the supernatural origin of the activity questioned.

Eventually it was staff at the museum that discovered that the draught-board episode was linked to a loaf of bread, the location where the draught counters would be found gathered at in the morning. When the bread was removed the alleged paranormal activity stopped. In addition the board was frequently found covered in droppings.

It is extremely likely therefore that rodents, of which Killhope has a great many, and not the paranormal were responsible for this phantom draughts playing, by virtue of their well documented hoarding behaviour. A camcorder monitoring the board would have sorted this out fairly quickly.

I have been working with others on a number of ideas about the usage and placement of camcorders and currently favour one positioned in the corner of the room with a good view, locked off and left running. This is in marked contrast to that most commonly seen and often described as being stationed directly over the object.

The placement of the camcorder is by necessity a compromise between maintaining the integrity of the environment, the needs to demonstrate the absence of fraud and the direct observation of any movement. I am, as always, loath to bring so called paranormal detecting equipment into the investigation area as these are untested scientifically and any claimed benefits of their use in the investigation sphere are based on mere surmise and assumption.

Methods of Trigger Objects Experiments

As my own experiments with Trigger Objects have progressed, so have the methods which I am experimenting with. From the origins of an object placed on a sheet of paper with the object drawn around, which is perfectly acceptable as an experiment and one I still use in extremis, I am presently favouring the method of the object being placed upon a dusted tray (A baking tray will do perfectly) which, when all is in place is dusted lightly with baking powder or talc or other fine powder. Any movement is easily detected as are fingerprints on the object, and no mess is left behind which the owners of the property would take offence at, for everything is contained within the tray.

It is in truth merely an advancement on the dusting powder techniques employed by Harry Price (17/1/1881 – 29/3/1948) in the 1920's and 30's, but, so saying, it remains as valid today as it did back then. Price, a famous debunking Paranormal Investigator, was the founder and eventual honorary director of the National Laboratory of Psychical Research of London. He was also the former foreign research officer of the American Society for Psychic Research, an amateur conjurer, the Honorary Vice-President to the Magicians' Club, London.

In 1936, Price organised a live radio broadcast from a supposedly haunted manor house in Meopham in Kent. In 1937 he famously rented Borley Rectory for one year.

In 1938 he re-established the Ghost Club with himself as chairman, During the 1940s, Price concentrated on writing with the output of *The Most Haunted House in England*, *Poltergeist Over England* and *The End of Borley Rectory* .

Another direction in which my attention has been turned when regarding Trigger Objects is a 21st century version of Carrington's Box. Hereward Carrington (1880-1958) was another influential figure in the study of the paranormal from the age of 19 when he joined the Society for Psychical Research to his death in 1958. Generally he adopted an anti-Spiritualist line but changed his stance after reading Miss X's *Essays in Psychical Research*. He was founder of the American Psychical Institute and Laboratory and investigated the credibility of such famous mediums as Eusapia Palladino and 'Margery' Crandon.

The original Carrington's Box was a small wooden box internally fitted with bell, wires and battery. It was designed and made by Hereward Carrington to test the validity of physical mediumship. When pressure was exerted upon the lid of the box it pressed down upon 2 metal contacts which completed an electrical circuit and caused a bell inside the box to ring.

I have been experimenting with touch pads and micro-switches placed beneath a plate upon which the trigger object is placed, the concept being the same as Carrington's that pressure (in my experiment that is sufficient to move the object) would activate the trigger and sound the bell.

Examples of successful Experiments

Some paranormal investigators of my acquaintance have suggested other ideas, and I am grateful to them for allowing me to include some of their methods and results that they had received when using Trigger Objects during their investigations.

Vicky Glidewell of Tulsa Ghost Investigators wrote, that whilst investigating an abandoned hospital in Oklahoma USA, she had success with objects placed on the floor within a chalked circle. In one particular experiment there were several objects utilised as triggers, including a necklace, a doll, a book, and so forth. At one point during the investigation, a very loud CRACK was heard as a large fragment of brick was apparently thrown at the feet of the investigators, who were alone in the building and locked in. After checking the trigger objects for movement, the necklace was found to be missing from its circle on the floor and was discovered to have been apported into the adjoining room.

Katie Klintner of Fox Valley Spirit Hunters in Wisconsin USA related how her group have used trigger objects on occasions with limited results. The best result being with a coin on a piece of paper with a camcorder trained on it. Although the coin didn't move during the experiment in an empty former library, the audio from the camera picked up odd thumps and bumps and bangs although there was nothing in the place that could do that. The most interesting sound was that of a sliding door closing when there were no sliding doors anywhere in the building.

Suzanne McKay of North East Phantoms Paranormal Investigation group detailed a trigger object experiment, where they had placed a lollipop in the flour tray and sat down to do a séance, During which they asked if the spirit (who in this case was alleged to be a young girl) if she would like the lollipop. At the end of the séance it was noted that the lollipop had gone. A thorough search found imprints of flour where it looked as though it had been dropped (outside of the room where no one had ventured into yet.) To this day it has not been found.

Matt Farrell from North Florida Paranormal Research suggested that cards/poker (which was very popular years and years ago) is a good experiment to try. This is achieved either by setting out a deck of cards, and observing to see if cards move, or even engage in a game with another member of the team while videoing it and recording audio. Apparently he has received some positive results from this.

In another experiment he tried at a reputedly haunted Florida theatre Matt went around and put every seat in the theatre in the upright position, (some of the seats wouldn't stay up, so he marked these by taping a piece of white paper to them to denote their down position at the start of the experiment. During the night the seats were periodically checked to see if any had been lowered.

The Olathe Society for Paranormal Research & Investigation noted on their investigation of a private house at Warrenton USA placed a trigger object (unfortunately a cylindrical object which is suspect as it is liable to roll with vibration) on a blank piece of paper and crudely outlined. Within two hours it had rotated perhaps 30 degrees in a counter clockwise direction.

Kirst Adcock of South Yorkshire Paranormal Research wrote about an investigation they conducted at a private house in Hoyland Common in Yorkshire. The experiment consisted of a selection of coins placed upon a sheet of paper, all of which had been drawn around to identify any movement.

This experiment was placed in a locked off room with two cameras focused on the coins, EMF meter and voice activated tape recorder. A de-tuned radio was broadcasting soft background static, at a level which would not trigger the recorder.

The experiment was left for an hour and then checked. It was discovered that the coins had moved, but nothing had triggered. Unfortunately, the movement was so slight that the cameras didn't pick up the movement. No one had entered the room and there were no vibrations from traffic.

Sharon Grainger of Shadows of Manitoba Paranormal Investigations in Canada wrote to me describing a problem that they discovered when using dusting powder or in this case it was flour. The owner of the property under investigation had cats, and after discussion it was decided not to evict them during the investigation. And so, having set up their equipment and a trigger object experiment with a camcorder monitoring it in the basement, they left. Some two hours later they returned to find a paw print in the flour as a cat had managed to get into the basement and interfered with the experiment. And more serious for the investigator/client relations, she added:

> *"At the end of the investigation just before we were leaving one of the cats vomited."*

The warning here is not only do not have animals anywhere near an experiment because they will often circumvent all precautions taken to keep them out of set aside areas, but also to ensure that only inert and non toxic substances are used – just in case.

The obviation of natural and fraudulent means of moving a trigger object

It is not just animal fraud, as discussed in Sharon's account and the mice at Kilhope Mine, the investigators themselves may be the instigators of movement that is later interpreted as being paranormally derived.

Discounting intentional fraud, something of which I am sure that none of the elucidated members of this society would ever be accused of, the first and perhaps most obvious fraud in movement is caused by unintentional investigator error. The most common scenario is one where, as I have read so often, groups or even individuals wander around during an investigation in the pitch dark. If one or more of these individuals are unaware of the location of trigger object experiments they may blunder into them, perhaps unaware that they have done so or do not confess to their accident. Sometimes walking around, especially in old buildings, will create vibrations that travel through the floorboards and create a false trigger. Be aware of heavy traffic moving outside, or even water rushing past in the case of mills or waterside properties. The contracture of a wooden building with wooden flooring on wooden joists, a common feature at night characterised by the creaks and groans that have in the past themselves been erroneously interpreted as paranormal phenomena by the credulous, may also be a cause in vibration induced movement. Knowledge that vibration may cause movement is the best guard against it and precautions in the form of the position of the experiment may be taken. One idea that was suggested to me was the setting up of an identical experiment next to the first and comparing the amount of movement in both.

Unfortunately no matter how circumspect we are in setting the experiments, that slight difference in location may be enough to enable slight movement in one and nothing in the other. If monitoring the object with a camcorder it should be possible to measure for any vibrations by the simple means of a clear beaker of water next to the experiment. Vibrations capable of moving the object would certainly cause movement on the surface of the water.

It seems obvious that good communications throughout the investigating team and the owners of the property, regarding both the nature and the position of the experiments, is vital if that experiment is to have meaning.

To obviate animal and insect fraud I find myself I complete agreement with the ASSAP stance where they question the justification for this approach.

> *"Since most haunting phenomena are generally experienced by original witnesses in perfectly normal lighting, holding vigils in the dark is an artificial experience. It does not duplicate the original conditions of the reported experiences. It may therefore stand less chance of reproducing the originally reported phenomena, rather than more."*

Dim lighting conditions are preferred to that of complete darkness to obviate any need for flash, which was found to be detrimental to any paranormal manifestation occurring by many early paranormal investigators others. Gustave Geley (1865-1924) a distinguished psychical researcher and Director of the Institut Metapsychique International from 1919 to 1924, observed in his experiments with lighting on spirit manifestation that red light was tried during the materialisation process with success. But Geley (1927) went further in his studies, realising the needs of the investigator to throw light on any experiment to obviate allegations of fraud. His experiments suggested a faint red light which is controlled via some form of potentiometer may be tried to some effect as long as:

> *The light is kept low till trance is complete; the light may then be very slowly increased up to sufficient visibility, but care must be taken not to direct the light on the medium. Only reflected light should reach him, and the dorsal region should always remain in shadow. "*

Dim lighting also eliminates those dark shadows which look like figures in corners, assists in identifying insects in flight and spiders on silk and most importantly, with a camcorder in position it can be demonstrated that nobody has entered the room nor tampered with the experiment.

In summary

What I have attempted to achieve in the above text is to illuminate the reader that it is not enough to place an object in the hope of something paranormal occurring.

The parameters necessary for the experiment to succeed (choice of artefact, placement of artefact, method for the detection of movement and type of haunting) are all key factors to consider before starting the experiment. It is only by careful consideration of these key elements that we can hope to have success in the field and claim that the Trigger Object is a valid investigation technique.

It is my contention that a suitable trigger object experiment is one where an object, suitably chosen for the occasion based upon prior research or probability of success, is placed in a prominent and highly visible location and on a solid stable surface.

The location should be a locked off or denoted as an "out of bounds area" that everyone on the investigation is aware of, and one which has in the past demonstrated a propensity for paranormal phenomena occurring.

It should be either placed on a sheet of paper with its outline traced onto the paper beneath or in a tray with flour or other such substance to accurately measure any movement of the object. Any movement must be photographed and documented recording amount of movement and time observed, before the experiment is reset.

The experiment should be clearly and legibly marked with instructions regarding the desired outcome.

The experiment must be conducted in a manner whereby fraud is obviated by having a camcorder monitoring the experiment, always assuming that the camcorder as an electrical field does not interfere in the activities or manifestation of the spirit,

The experiment, and preferably the entire investigation, should be conducted in dim or red lighting conditions rather than pitch darkness, thus obviating the need for torches and flash photography which are both detrimental to materialisations and night vision.

This, it is suggested, maximises the chances of success whilst minimising the chances of the allegation of fraud.

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