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ASSAP, 27 Old Gloucester Street, London, WC1N 3XX.
0870 330 8668 www.assap.org

Editor: Dave Wood
Managing Editor: Matthew Hicks
Editorial Board: Andrew Homer, Michael Lewis, Hugh Pincott.
Proofreaders: Ann Hopkins and Nicky Sewell.
Typesetting: Trystan Swale
Front Cover: Wendy Milner
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EDITORIAL:

This November's edition of Anomaly sees something of an auditory theme. Most 'haunted house' researchers are probably aware that auditory phenomena – from taps and footsteps to so-called voices on tape – are amongst the most common type reported by eyewitnesses and researchers like.

Anomaly 41's first article is Dave Wood and Malcolm Gould's original research into the established 'New House Effect'. This is followed by an unparalleled piece by Maurice Townsend on the subject of Electronic Voice Phenomena (EVP) analysis; the article is based on Maurice's webpages, which have been the subject of praise worldwide. This edition also includes three book reviews, which will hopefully be of interest to ASSAP Members.

Please remember that the Anomaly Team is still looking for members of the Editorial Board and proof-readers. If you can help please email Dave and Matt on anomaly@assap.org

WHAT'S THAT NOISE?
An Exploration into the New House Effect

By Dave Wood and Malcolm Gould

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 studied and extended 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 – LABELLING 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 AND PARANORMAL INVESTIGATORS

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/investigators 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 featured 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: 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	-

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.

DISCUSSION

The results of this analysis do not provide robust evidence for the hypothesis: 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 scientifically unsubstantiated 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, where appropriate, any reliance 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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ANALYSING PARANORMAL SOUND RECORDINGS

By Maurice Townsend

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 (for more general EVP research try http://www.assap.org/newsite/PDF%20pages/EVP.html). 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. For more information see http://xenia.media.mit.edu/~barons/pdf/arons_AVIOSJ92_cocktail_party_effect.pdf.

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.

Most importantly, don't 'enhance', edit, 'improve' or manipulate your recording in any way. Some people 'tidy up' or 'enhance' their recordings but this has several serious side effects:

- 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 artifact 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.

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.

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).

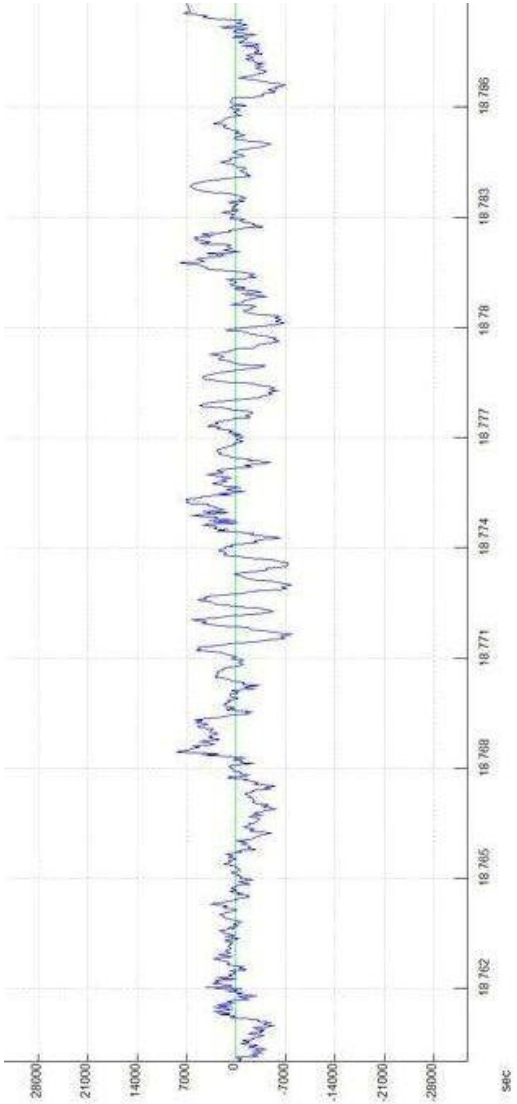


Fig 2: This is the unvoiced T sound, also as in the word 'let'. It is from the same recording at fig 1. Notice how the wave crests are closer together than in fig 1. When wave crests are far apart it implies low frequency. The voiced E in fig 1 contains lower frequencies.

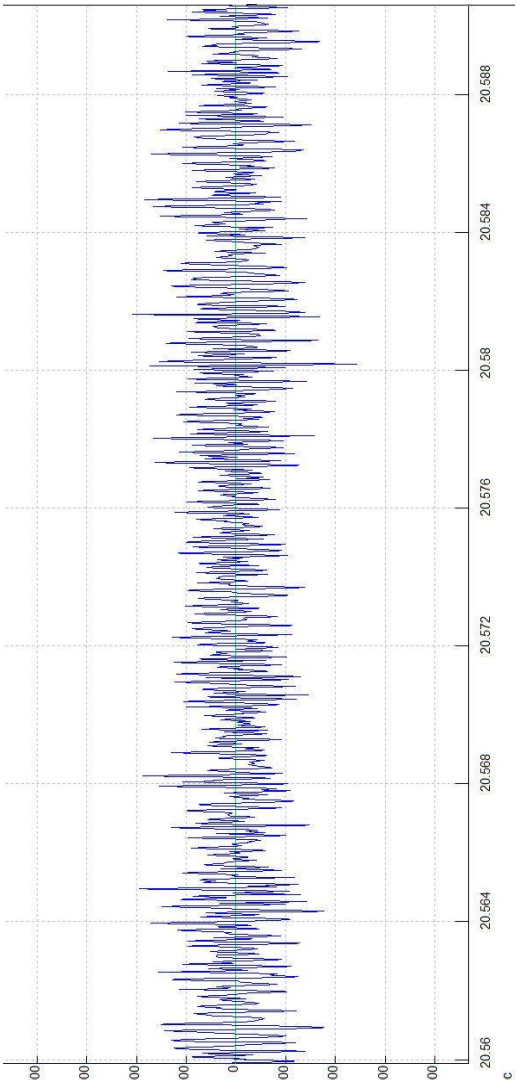
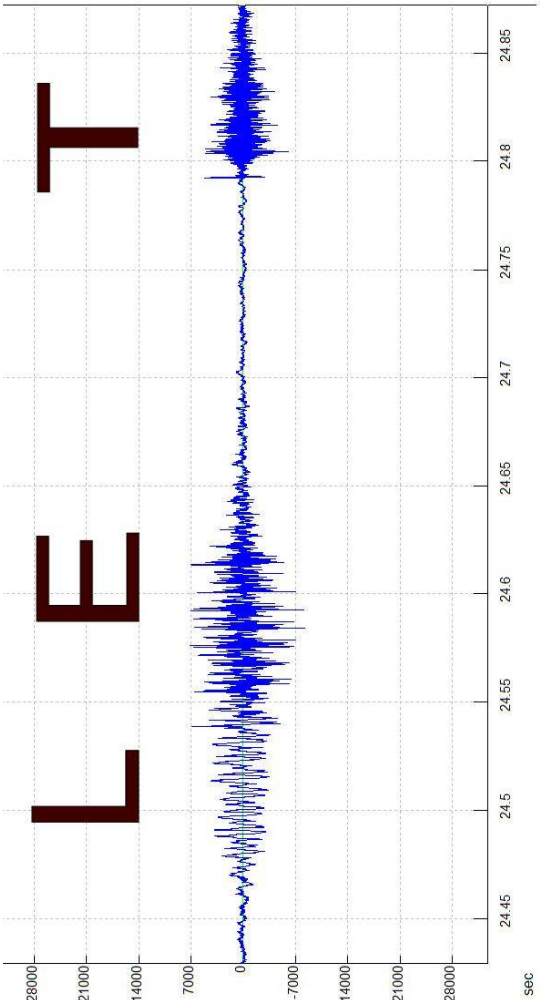


Fig 3: This is the complete word 'let' (ordinary human speech). Notice the frequency increases from the L to the E (which are both voiced) though both are much lower frequency than the unvoiced T sound. There is a gap of over one tenth of a second between the E and the T, while the tongue and lips are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



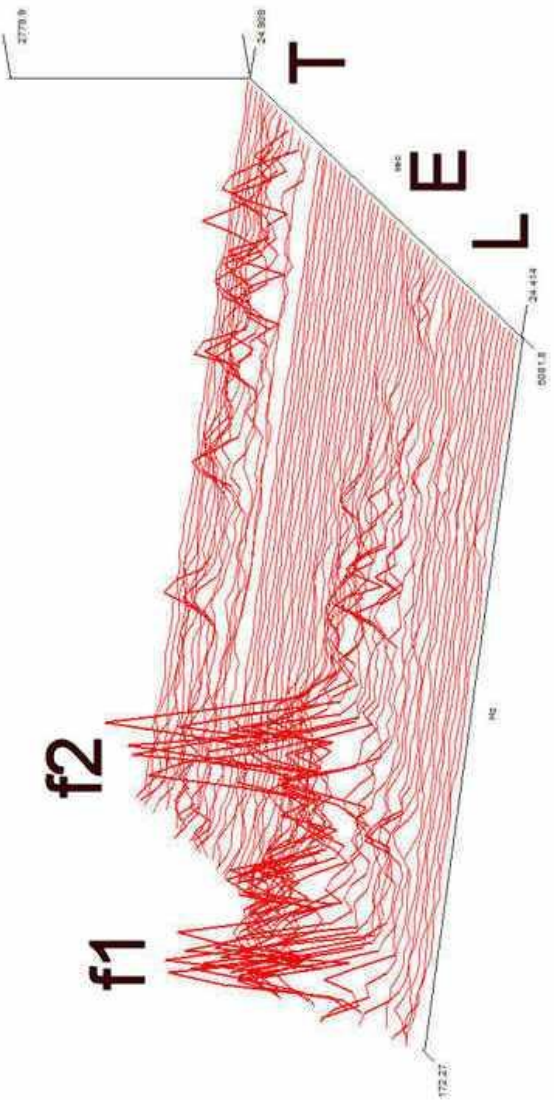
The individual distinct sounds of speech are called 'phonemes'. You can see them easily in the LET example (see figures above) where the phonemes happen to correspond to individual letters, though this isn't always true. Some phonemes are composed of multiple letters (like 'ph' being pronounced as 'f'). 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!

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.

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.



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 nonsense words. 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

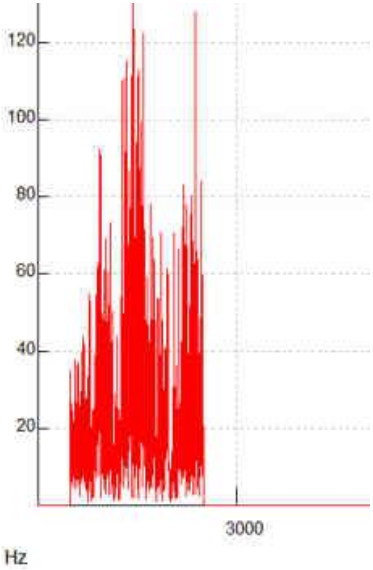
Based on the above, a perfect formula for 'formant noise' would be a sound of speech-like frequencies containing at least two frequency peaks that happen to be in a frequency ratio typical of speech (particularly a harmonic relationship). In addition, some time gaps between intensity peaks (to produce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

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.

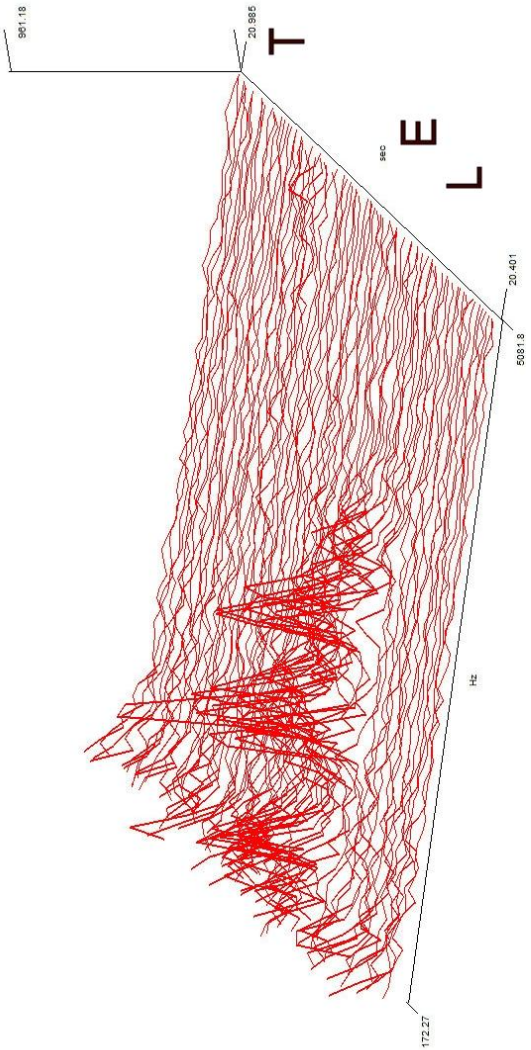
Some designs of microphone (including popular ones) can pick up magnetic field disturbances. Thus, a magnetic field varying at similar frequencies to sound could produce a recording directly via a microphone, despite no sound being heard. Such magnetic field disturbances need to be quite strong, however, 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.

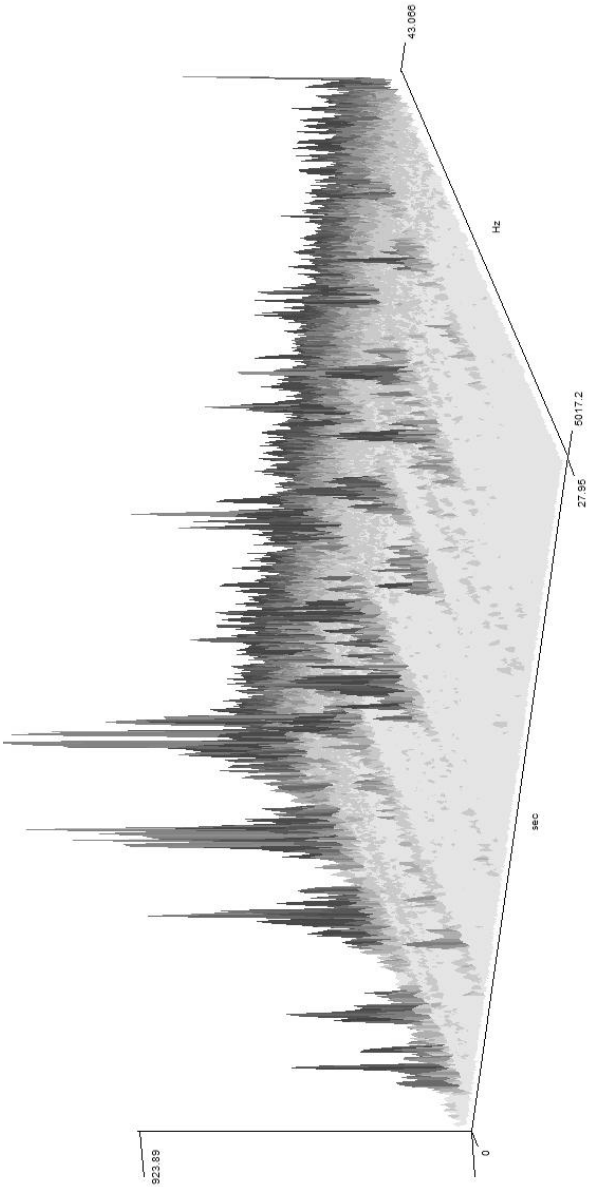
Fig 6: In this frequency diagram, the word LET is spoken again (ordinary human speech). However, this time the voice is more distant (a couple of metres from the recorder). Compare this with figure 4. Though the E sound is still distinct (though much less intense) but the L and T sounds have vanished!



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).

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.


43.066
Hz
5017.2
27.95
sec
923.89
0

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.

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.

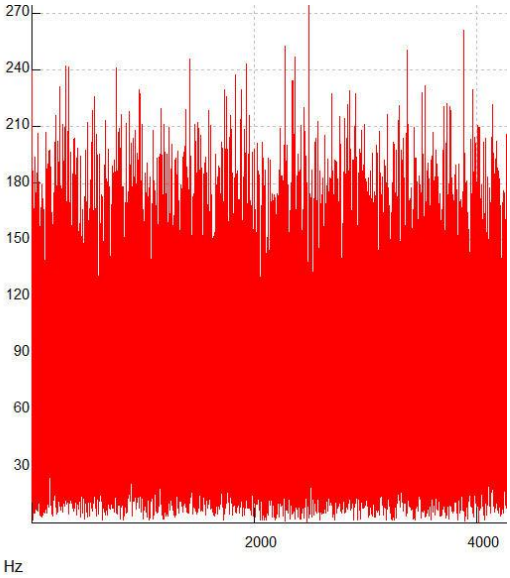
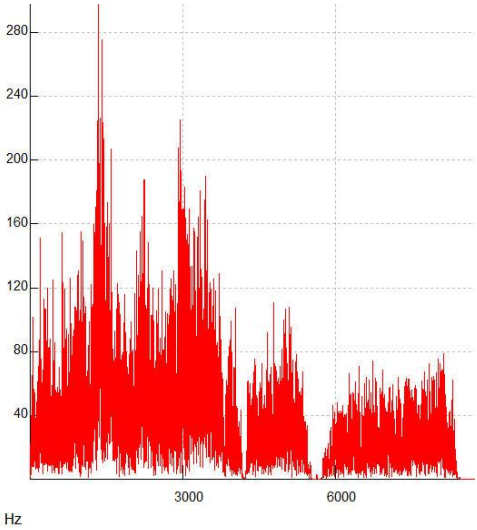


Fig 9: This is similar to fig 8 except that it shows radio 'white noise'. It was recorded by tuning a radio between stations, a method used by some EVP researchers. It is certainly not white noise in the strict sense (compare it with true white noise in fig 8). There are notable peaks at the 1500 Hz 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.

BOOK REVIEW: AN INTRODUCTION TO PARAPSYCHOLOGY, Irwin H. J. and Watt C. A., 2007. McFarland and Company, pp.320. ISBN: 978-0786430598

By Trystan Swale

The fifth edition of an established university textbook, *An Introduction to Parapsychology* surveys the subject's history, value as a science and the efforts of parapsychologists to authenticate the existence of seemingly paranormal phenomena.

Within the introduction the authors narrow their field of study, not to a general discussion of all anomalous phenomena, but to 'the study of experiences having the appearance of being in principle outside the realm of human capabilities as conceived by conventional scientists.' Thus the focus is specific to the disputed talents of extrasensory perception (ESP, the aquiesence of knowledge without inference) and psychokinesis (PK, the ability to influence objects within the physical environment by mind power alone). However, the authors concede that the study of the survival hypothesis (the ability of the human to transcend death) forms an essential third limb of parapsychology, particularly when studying those who claim to be able to communicate with, and obtain knowledge from the dead.

The relevance of the survival hypothesis is made clear within Chapter two, Origins of Parapsychological Research. It examines the careers of four spiritualist mediums – Daniel Home, Leonora Piper, Charles Bailey and Helene Smith – and the investigations undertaken into their abilities by the Society for Psychical Research. Particular focus is given to the weaknesses of these investigations, namely the need for more phenomena-specific testing and an adherence to controlled conditions. The reader is left with no doubt that such gaps in historical research have provided contemporary parapsychologists with the opportunity to address these limitations.

Chapter three, The Phenomenology of Extrasensory Perception provides both a conceptual background of ESP and an appraisal of its broad characteristics. Differing methods of spontaneous case collection are highlighted, together with discussion as to their relative merits. Likewise, the differing types of ESP experience such as hallucinations, dreams and telepathy are examined and their limitations made clear.

Issues as to the authenticity of ESP and the switch to experimental inquiry by contemporary researchers are outlined in chapter four, Experimental Research on Extrasensory Perception. Particular focus is given to the development of the card guessing tests devised by J. B. Rhine and the use of statistics to distinguish chance from genuine instances of ESP. The Maimonides study of ESP within dreams is also covered, although the difference between this and Rhine's studies lead the authors to outline the key faults in ESP research: the lack of a definitive test for ESP, the use of results from flawed experimentation to collate a cumulative record, and weaknesses in the logical

scrutiny of this data. The second section of the chapter reviews the work undertaken to 'reveal the characteristics of processes underlying the hypothetical phenomena of ESP'. Covering various settings and procedures, the variables of each method – such as the Ganzfeld process – are examined alongside the result trends and patterns each have produced. Attention is given to the theories which have arisen from the latter, including the differential effect and psi missing.

Extrasensory Perception and Time, chapter five, focuses specifically upon approaches and experimental investigation into ESP related to events displaced in time; examples being precognition, retrocognition and their associated phenomenology.

Psychokinesis is the subject of chapter six. Following the same structured layout as chapter four, the phenomenology of PK experience is outlined before attention is shifted to experimentation techniques including J. B. Rhine's dice rolling machine. A review of process-oriented experimental research on PK then follows, identifying the variables, patterns and subsequent improvements experimentation has produced. The chapter ends with a brief discussion as to whether individuals adept in ESP are similarly proficient in PK, outlining the lack of process-oriented research with the latter to provide any meaningful conclusions.

Special Topics in PK Research are the subject of chapter seven. The issues of researchers influencing experiments with their own ESP (the parapsychological experimenter effect), psychic healing are psychic photography are all appraised in terms of current understanding. Attention is also given to the possibility of the human mind being able to interact and influence other biological organisms through thought alone. The authors again conclude that, with the exception of psychic photography as open to fraudulent practice, a shortage of meaningful, well documented research hinders an overall assessment of specialised PK research.

Chapter eight, Theories of Psi, scrutinises the relative merits of various theories accounting for ESP and PK – collectively termed psi. These include Persinger's research into the mediation of extremely low frequency electromagnetic waves into the brain and Schmeidler's model of psi as a pseudosensory biological function presents. Notably, space is also given over to analysing sceptical theories of psi, most typically the attribution of such experiences to 'misperception, misinterpretation, inaccurate recall of individual experiences, or chance'. An assessment of the sceptical theories is made by the authors suggesting that overall trends in psi research show trends which cannot easily be discounted. With both parapsychologists and sceptics promoting the worth of their own agendas the authors suggest the two parties should work together to construct 'skeptical theories that generate predictions capable of being pitted against those of parapsychological models.'

The Survival Hypothesis is studied in chapter nine, together with the potential influence that ESP may hold over the production of meaningful results

in any experimentation. For example, the possibility remains that spiritualist mediums may gain information from the subject of a reading, as opposed to contacting any spirit. Two classic means of testing the survival hypothesis are also analysed, namely Stevenson's 'combination lock' test and Thouless' 'cipher test', alongside contemporary laboratory study of mediums. Finally, brief consideration is given to the 1999 Scole Report under which spectacular events occurred in the séance room, in which investigators were unable to detect any signs of trickery. A balance is provided by assessment of the conditions under which the séance occurred.

The following four chapters focus upon specific phenomena within the field of parapsychological research.

Chapter ten, Poltergeist Experiences, queries the roles which subconscious PK, neurological factors, misinterpretation and the survival hypothesis may play in the creation of poltergeists – disincarnate entities of some form with the ability to influence inanimate objects and display potentially violent and destructive behaviour. In chapter eleven attention is given to Near Death Experiences (NDEs), their phenomenological characteristics, correlating factors and the theories behind them. A variety of psychological and neuropsychological theories are given together with a brief appraisal of each. A similarly structured approach is utilised to provide overview and analyses of Out of Body Experiences (OBEs), apparitional experiences and reincarnation experiences in chapters twelve, thirteen and fourteen respectively.

With chapter fifteen the authors' attention switches to the issue of Belief in the Paranormal. Whereas previous chapters may imply the existence of certain paranormal phenomena, it is here that the sceptical agenda is briefly considered. Given the often inconclusive, contentious theories and evidence from both sides, space is given to the social and psychological factors which may cause individuals to firmly believe or disbelieve in the existence of paranormal phenomena. The factors of age, gender, socioeconomic status, ethnicity, religious background and educational attainment and psychological adjustment are each analysed to produce a general, if potentially sweeping, picture of a modern believer. The chapter closes with a look at the function paranormal belief or disbelief serves to an individual, namely accordance with a particular world view.

The implications of parapsychological research in relation to other academic fields are discussed in chapter sixteen, Matters of Relevance. Discussion is given to the potential need for psychiatrists to understand rather than dismiss their patients' experience of ESP within dreams, or PK in their everyday lives. Consideration of psi's wider implications is also briefly discussed including its use as a gambling aid and as a tool to gather military intelligence.

The authors close their book with an Evaluation of Parapsychology as a Scientific Enterprise. They chart the work of parapsychologists who have mirrored the investigative, controlled and ethical approach of established science as a shift away from the Society for Psychical Research's reliance upon

anecdotal forms of evidence. Balance is provided by examining the criticisms of parapsychology from various scientific and sceptical voices, although the authors have the view that criticism is largely based upon the 'a priori conviction that parapsychological phenomena are impossible'. Charles Tart's assertion that many scientists and sceptics are 'scared of psi' is offered as a counter to the critics, and the authors themselves close with a bold statement: 'if just one of the [parapsychological] phenomena should be found to demand a revision or an expansion of contemporary psychological principles, how enriched behavioural science would be'.

Such a conclusion is thought enough for a reader previously unfamiliar with the field of parapsychology, whether student or curious minded. With *An Introduction to Psychology* Irwin and Watt neatly survey and analyse the key facets of parapsychology and its current limitations inside a text that is both informative, uncomplicated and readable.

BOOK REVIEW: QUIRKOLOGY: THE CURIOUS SCIENCE OF EVERYDAY LIVES, Wiseman, R. 2007: Macmillan: London. £14,99 (hbk), 299pp.+xix ISBN: 0330448129

By Dave Wood

Quirkology is a popular book marketed for a mass readership. From the front cover comprising an optical illusion to the teasing back cover of trivia-like questions, Professor Wiseman's book is clearly not intended to be a scholarly work. As *Quirkology* appears to flirt with the 'science is fun', light-heated approach to bookselling one might wonder why its review should be of interest to the journal of a scientific study association. Further, with sections devoted to the psychology of humour, pro-social behavior and deception one might also think it might be of little interest to those interested in the paranormal and anomalous phenomena.

To offer a justification, it is the opinion of this reviewer that Wiseman has something of a hidden agenda in the publication of *Quirkology*. Whilst those expecting humour, irony and useless trivia for practical employ at parties will not be disappointed, *Quirkology* also strictly adheres to the scientific method. Astoundingly for a short, populist work, *Quirkology* contains a staggering twenty-two pages of reference citations.

From an educational science perspective the total work is highly admirable. Hardly a page goes by without Wiseman outlining a scientific method, critiquing an experimental procedure for not being methodologically water-tight or combating ills such as poor probabilistic reasoning or faulty attributions. The hidden agenda of *Quirkology* would appear to be an attempt to subtly educate

readers about the nuances of the scientific method in a highly accessible way by discarding jargon and applying the scientific method to 'quirky' topics.
For those interested in the anomalous experience, Wiseman delves into subjects such as haunted houses, astrology, superstition and suggestibility.

Beyond the interest to the science of anomalous experience, the introduction's stated aim of the book is the promotion of 'quirkology' as a coherent and valid branch of psychology. 'Quirkology', which might alternatively be described as 'silly science' or 'populist science', might not be a coherent contender for greater recognition but the many more redeeming aspects of the book should commend it to readers.

Chapter one, "What does your date of birth really say about you?", focuses primarily on personality and chronopsychology. Highlights of the chapter include the psychology of luck and astrology including the role of the Barnum Effect in horoscopes.

Chapter two, "Trust everyone, but always cut the cards", claims to examine 'the psychology of lying and deception. The chapter opens with crowd-pleasing summaries of experimentation into deception by animals and children and an apparent 'how to ' guide to deciphering deception by analysing language and body language. Chapter two peaks, however, with sections on deception through exploitation of human suggestibility, including a section on hoaxing in the séance room.

Chapter three, "Believing six impossible things before breakfast", bills itself as a 'twilight zone' chapter delving into several subjects including superstition, coincidence, infrasound and 'haunted houses'. Noteworthy sections in this chapter include the attempt to justify the claim that "superstition has cost millions and killed thousands" and a useful and accessible discourse on why improbable coincidences are, in fact, likely. Wiseman's 'ghost section' only slightly disappoints: explanations on the role of 'context' in haunting perception are firm but brief and the role of infrasound, whilst educational, risks overstating the case. Unfortunately little else of the wide and fascinating array of psychological triggers of hauntings is discussed.

Chapter four, "Making your mind up", goes into some depth in the social psychology of decision-making. There are a number of crowd-pleasing sections on attraction, personal ads and politics but of less interest to the anomalous phenomena enthusiasts.

Chapter five, "The scientific search for the world's funniest joke", details an unfortunately flawed experiment of Wiseman's but is nevertheless amusing and light-hearted.

Chapter six, "Saint or sinner?", is, essentially, a cross-cultural study of anti-social and pro-social behaviour across time.

So how successfully does *Quirkology* achieve its aims? The book does not seem to present a coherent 'quirkology' and more feels like a disjointed piece on 'popular science'. In terms of presenting a popular piece of literature that is accessible it shines. The aforementioned subtle education of science is admirably handed, yet in certain places it feels the author does little to provided a balanced view of admittedly disputed evidence.
Hopefully this review will have justified the inclusion of *Quirkology* in the journal of an anomalous science educational charity and perhaps persuaded a few of its worth.

Quirkology might not be essential reading for experienced enthusiasts, but it could provide an excellent and accessible starting point for those wishing to develop their interest in the rationality of unusual branches of psychology and science.

BOOK REVIEW: YOUR IMMORTAL BODY OF LIGHT, Gibson M. E., 2006. Reality Press, pp.136. ISBN: 978-0977790456

By Trystan Swale

Your Immortal Body of Light charts the progress of Mitchell Earl Gibson's route to spiritual enlightenment through transcendental meditation. Whilst the potential benefits of meditation have been explored by other authors Gibson's book is unusual due to his employment as a 'forensic psychiatrist'.

Author John Jay Harper's inspirational foreword stresses the key theme of the forthcoming pages; the alleged existence of an immortal 'light body' within each human. He also relays his belief that our planet should be better preserved by humanity, for the reason that it assists humanity in shedding the physical world for that of the spiritual.

Chapter one presents a simple introduction to Gibson, his Baptist childhood, employment and introduction to meditation at the age of twelve. He also begins the narrative of his spiritual journey, encountering the vision of Djeuthi, an eight feet tall golden man, during one of his meditations. This entity offers Gibson a number of unspecified, mysterious 'shamanic journeys' before disappearing without the psychiatrist's response.

Within chapter two Gibson stops his meditations to ponder his meeting with Djeuthi. He is sceptically trained yet also aware that many religions (including those which are Judeo-Christian in origin) are focussed upon 'transubstantiation', the ability to transcend death and achieve an immortal

existence in the form of a spirit or 'light being'. Reassured by this religious knowledge the author returns to his meditative sessions in the hope of becoming reacquainted with Djeuthi.

Gibson's golden man returns in chapter three, taking him on a 'trip' to view the burning sphere of his own soul in physical form. During this voyage Gibson is witness to a succession of further visions, which Djeuthi states may have come from one or more of the author's previous incarnations.

In chapter four Djeuthi appears to Gibson during a counselling session with an elderly nun in the final stages of terminal cancer. The entity states the nun is fearful of death having desired a family, a wish at odds with her religious vows. Djeuthi encourages Gibson to communicate by touch with the nun's soul and release her burden. Although the author is shocked to learn of the nun's death later in the day, he is reassured that both he and Djeuthi were able to assist with her transubstantiation.

Djeuthi takes Gibson upon another 'shamanic journey' within chapter five. The pair view the cloud like form of a human prayer belonging to an Oriental child, and watch as it is consumed by a spinning gemstone. This experience continues within the following chapter with the entity explaining the gem represents the inner core of the child's soul. Djeuthi goes on to outline the five individual sections of the human soul: Word, Actus, Prima, Nomen and Name. All but the Name respectively relate to spiritual functioning, psychic ability, physical healing and communication with God. Finally, the Name represents the verbal name given to the soul by God.

In chapter seven Gibson approaches his partner Donna to discuss his experiences. They learn from a study guide that Djeuthi is another name for Thoth, the Egyptian god of healing. The entity later reappears to Gibson, dismissing the assertion made of his Egyptian origin. Instead he delivers a stunning relevation; as all souls came into being at with the creation of the universe both humans and light beings are the same species, albeit at different stages of their existence.

Within chapter eight the reader is able to observe how the author's increased spiritual awareness affects his hospital work. Gibson is able to physically observe the auras of light surrounding patients and, with the initial assistance of Djeuthi make a succession of diagnoses. Tired, at the end of a night shift, Gibson's final visitor is a man without an aura who claims to be an entity from a different galaxy. Without Djeuhti to further explain this man's presence both Gibson and the reader are left pondering his true identity. The answer is provided by Djeuhti within chapter nine. The mysterious visitor is God. He is a being from a realm which predates the creation of the physical universe, created from dense matter. Regrettably Djeuthi is unable to offer an explanation as to God's motive for appearance.

Still utilising his ability to read auras as a diagnostic tool, Gibson experiences the dangers his powers more sparingly following an attack by a violent, mentally ill patient in chapter ten. Djeuthi explains that those who view

the souls of others leave their own open to exploitation. This explains Gibson's post attack tiredness; the patient, Sarah, has drained the author's soul of the energy needed to spark her aggression. Djeuti also explains the patient's illness in terms which may leave the reader disconcerted. On one level it is caused by the spirit of her stillborn child which has attached itself and continues to drain her soul. On a second level, she is infected by the lingering spiritual essence of a former pimp who brutally raped her. Both the forms of child and evil manifest themselves as orb shaped spheres of energy.

Gibson's path to spiritual understanding reaches its dramatic climax in chapter ten. Sarah returns to hospital following a fatal shooting. It is down to Gibson to locate her soul and present it with a series of choices as to her future existence. Her choice is not, perhaps, what the reader would expect.

The author's experiences are recounted in the book's closing summary, together with some suggestions as to how collective work by those aware of their 'body of light' could bring positive change to the world. One intriguing possibility is that participants may be able to influence global weather patterns.

Ultimately it is for the reader to decide whether awareness of an inner soul can bring positive changes both to the world and to each of us as individuals. Whilst Gibson has been brave as a doctor to produce a work as brave as *Your Immortal Body of Light*, should the reader be concerned that a medical professional uses spiritual tools to accompany those of an academic or scientific nature? Some readers may also query whether Gibson has perhaps medically scrutinised the nature of his own visionary experiences. No matter, the fast moving, first person narrative of *Your Immortal Body of Light* produces a text which can be accepted by all, even if the assertions made by its author cannot.

ANOMALY: GUIDANCE NOTES & HOUSE STYLE

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Papers should be submitted in the English language and should directly relate to some area of psychical research.
Authors take responsibility for any views aired, and published articles do not reflect the views of ASSAP.

TYPES OF SUBMISSION:
Please note that word limits are flexible.

- Letters may relate to previous articles published and can be written in a personal style. Letters should not be more than 1500 words.
- Book reviews should not be greater than 1500 words.
- Articles and research notes should not be greater than 4,000 words. We encourage authors to write such articles in an impersonal style, but this is not mandatory.
- Diagrams and photos should be submitted in grayscale if possible with a dpi of 300, but do seek guidance if you are unsure.

FOOTNOTES AND REFERENCES:
We prefer that footnotes are not used, however notes may be made at the end of articles with an appropriate numbering system in the text.
We encourage all authors to provide references, although this is not mandatory. This means that if you make an assertion of fact, especially about previous research conducted, you cite the source article, book or web address.
We prefer the Harvard system of referencing. Sentences containing references should include the author and year in parentheses, e.g. "theories suggest that orbs are not paranormal in nature (Townsend, 2006).
Where such references are included in the text an alphabetical list should be included at the end of the document, in the following style:
Henry, J. (Ed.) (2005). *Parapsychology: Research on Exceptional Experiences*. East Sussex: Routledge
Parapsychological Association (2006a) *What is the PA?*
URL http://www.parapsych.org/mission_statement.html Date accessed: 04 September 2006.
Thalbourne, M. A. (2005) 'The Pros and Cons of Being a Parapsychologist'. *Society for Psychical Research: Paranormal Review*, 36, 21-22
If you are uncertain please always seek guidance.

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