A Haunted Bed

by Maurice Townsend

You have probably read a lot here recently about how magnetic fields can induce hallucinations. These results have mostly come from laboratory experiments. Now we can present some early results from research using the MADS system to find such fields at a haunted location.

Laboratory experiments, notably by Michael Persinger, have demonstrated that certain low-frequency complex magnetic fields can cause susceptible individuals to hallucinate (see *Anomaly* 35, p2). It has been suggested that such fields, if found 'in the wild', could be responsible for some reports of hauntings.

Unfortunately, detecting such fields is difficult in a natural setting without specialised equipment that is not widely available. Though paranormal researchers have been using EMF meters on investigations, these are not suitable for detecting the fields (see *Anomaly* 34, p22). Therefore there has been little evidence to test the theory from field research until now. To fill this gap, ASSAP member Dr Jason Braithwaite designed MADS (Magnetic Anomaly Detection System) specifically to record relevant magnetic fields to see if they occur in allegedly haunted locations. ASSAP helped fund this relatively expensive equipment.

The Fields

Laboratory experiments have demonstrated a particular kind of low-frequency magnetic field that is capable of inducing hallucinations. Jason calls them EIFs - Experience-Inducing Fields. Broadly speaking, they are defined in the table below.

Factor	Magnitude
Magnetic field frequency	0.1 to 30 Hz
Magnetic field amplitude (flux density)	100 to 5000 nT
Time varying 'complexity'	1ms to 100s+ period
Brain susceptibility	Some 20 - 30% of the population
Length of exposure to EIFs	Over 20 minutes

There may be effects from fields outside these parameters, but the best results have been obtained within these limits. The magnetic field 'strength' (flux density) is very weak. For comparison, the geomagnetic field is typically around 50,000 nT. One of the most important considerations is field complexity. This means that the field is generally not simply a continuous sine wave, like the mains supply in a house, but it varies over time. This complexity may be the key to understanding how the fields interact with human brains. Some estimates suggest that only 20 - 30% of the population are susceptible to these EIFs.

While there are few natural sources of EIFs (eg. tectonic movement in magnetic strata), there are, perhaps surprisingly, many possible artificial sources. These include anything that vibrates a highly magnetically permeable object (eg. objects made out of iron or steel) as well as various electrical devices. Another important source of EIFs is human movement through complex static magnetic fields. Such motion subjects the brain to continually changing magnetic fields (see *Anomaly* 35, p2).

Magnetic fields are commonly stronger in buildings than electric fields. Though electrical devices usually produce both electric and magnetic fields, the electric component does not usually penetrate as far as magnetic fields. This is because such fields are absorbed by any electrical conductor that happens to be in the area. Such conductors are quite common in a domestic situation. Also, electric fields are unlikely to be able to penetrate the human skull to influence the brain / perceptions of observers. Magnetic fields, on the other hand, are usually only absorbed or distorted by ferrous materials. In addition, there is the pervasive geomagnetic field which is found everywhere on the Earth's surface, including inside buildings. Anything that causes a disturbance to such environmental magnetic fields could, potentially, cause an EIF.

MADS

MADS has been specifically designed to detect EIFs (see *Anomaly* 34, p22). It consists of two fluxgate magnetic sensors (fig. 1) which can measure fields down to 0.5nT over the low frequency range 0 - 125 Hz. The sensors are triaxial, allowing the overall field to be summed instantly, whichever direction they are pointing in. They record the static magnetic field (0 Hz) at the same time as the varying field. The sensors are attached to laptop computers that record all readings in real time. The data produced by the sensors can later be

Figure 1: MADS fluxgate sensor

analysed using various software packages to look for such things as individual frequency contributions (using fast Fourier transforms). ASSAP helped to realise MADS by purchasing two laptop computers forming part of the package. There is a formal description of MADS currently awaiting publication (Braithwaite, in press).

Muncaster

Muncaster Castle in Cumbria (fig. 2) is the site where MADS is being deployed for the initial research. The haunting at the castle has been continuously investigated by Jason for well over a decade.

There have been many anomalous experiences reported at Muncaster Castle. There are three things that make it a particularly useful test bed for MADS. Firstly, the experiences have been reported consistently by independent witnesses who had no prior knowledge of any hauntings. Secondly, in one location, the Tapestry Room (TR), there have been a number of quite specific experiences reported by people occupying the bed. The most impressive experience reported is the sound of a crying child,

Figure 2 Muncaster Castle

sometimes heard for as long as half an hour, from the TR bed. It is therefore possible to tie the experience to a specific, small locality - the TR bed itself. Other phenomena recorded at Muncaster include a feeling of presence, apparitions and the sound of footsteps.

The third reason why Muncaster is a good test bed for MADS is that there is no obvious source of EIFs present. It would be easy to guess that EIFs might be responsible for anomalous reports in a building full of electrical equipment or adjacent to industrial premises. Muncaster, by contrast, has little electrical equipment beyond that found in an ordinary house. In addition, since the rooms are on a large scale compared with a typical house, one would expect a low concentration of magnetic fields from electrical wiring in the walls and under floors.

The case for Muncaster being haunted is thus very strong. This cannot be said about many ‘classic’ hauntings whose reputations may well hang on little more than rumour, mis-observation and publicity (see *Anomaly* 36, p8). Due to the direct efforts of Jason's research, the phenomena at Muncaster are now becoming well known (though some aspects are being withheld). Tourists often stay overnight on organised ‘ghost sits’ in the TR hoping to experience something, though it is now possible to join Jason on a limited series of serious investigations he runs every year that are also open to the public. Though experiences recorded in such circumstances might be discounted as due to suggestion, the original reports predate any publicity about the hauntings.

The TR is laid out as a bedroom. There is a four-poster bed, several wooden items of furniture around the walls and a clear area in the middle. Visitors to the castle are free to go into it during the day. There are, as you might imagine, tapestries on the walls, some large pictures and an imposing fireplace. There is very little electrical equipment in the room - two bedside lamps by the bed and a couple of table lamps on furniture around the walls. There are several very similar rooms (in terms of size, illumination, decoration, etc.) nearby which are NOT known to be haunted.

First MADS Experiment

On 31 March 2004, just after the completion of the successful Muncaster Conference, Jason and Ian Topham put MADS through its paces for the first time in the TR. They spent two nights taking magnetic measurements there. These resulted in a paper (Braithwaite, 2004), the first study ever published of time-linked synchronised magnetic measurements at a haunted location. A follow-up paper is due to appear in the *Journal of Parapsychology* (Braithwaite, Perez-Aquino & Townsend, in press) in the autumn.

The initial experiment was designed to compare magnetic readings between the TR bed pillow and a baseline point in the middle of the room. Sampling was restricted to the 0-15 Hz frequency range. The pillow area of the TR bed was chosen because that is where a witness's brain would have been located if they were in bed and experiencing strange phenomena. The middle of the TR was chosen as a baseline position because it shared many parameters, such as illumination, temperature, 'haunted reputation', that have been implicated in producing anomalous reports. The main difference was that the middle of the room had NOT produced any such reports. In fact, just about the only thing that was significantly different between the two positions was the magnetic field.

Readings were made simultaneously at the two sampling points so that they could be directly compared later. Such time-linked readings eliminate the possibility that field differences are due to changes over time rather than position. This is an important feature

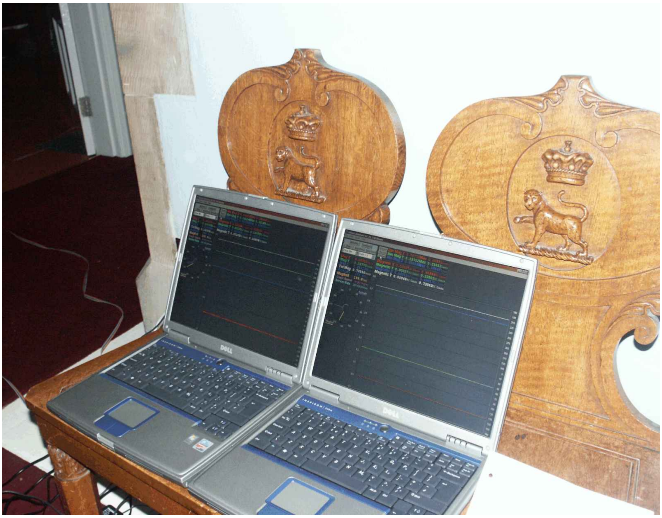
Figure 3 MADS in use at Muncaster

of MADS, often neglected in previous studies designed to test environmental variables at haunted locations.

The results showed a significantly higher magnetic field variation (amplitude) in the bed area over the frequency range sampled. The biggest variations were seen in the x-axis (horizontal). The bed sensor amplitude ranged up to 385 nT (55 nT SD - standard deviation) while the baseline showed 220 nT (30 nT SD). The readings from the bed sensor also showed greater variance, which is a crude measure of complexity. Thus the experiment supported the idea that the 'active' bed area is associated with higher amplitude and more complex magnetic fields (in the 0-15 Hz frequency range) than the baseline point.

The experiment was repeated on the subsequent night and produced similar results.

Second MADS Experiment

More experiments took place on 26 and 27 October 2004, with Jason and Maurice Townsend the researchers present. It, too, produced a paper (Braithwaite & Townsend, 2005). The main difference from the previous experiments was that the full MADS frequency range

(0-125 Hz) was sampled. This included the important 50 Hz region, which is the frequency of mains power in the UK.

MADS was again set up in a time-linked manner to compare the TR bed pillow and the baseline in the centre of the room. In addition, various locations around the bed were sampled. As well as flux density (amplitude), frequency contributions were examined on this occasion, and also static fields. This was the first published study ever to formally compare AC and DC fields together with time-linked sensors and the first to isolate both components and report / evaluate them separately.

Once again the field variability was found to be higher at the TR bed than at the baseline. This time, however, through frequency analysis it was possible to see what was actually happening with the magnetic fields. The picture that emerged was that the biggest contributor to the varying magnetic fields on this occasion was from a 50 Hz component. This clearly originated in the mains supply. A plain 50 Hz sine wave magnetic field does not qualify as an EIF as it is too high a frequency and has no complexity. However, this was

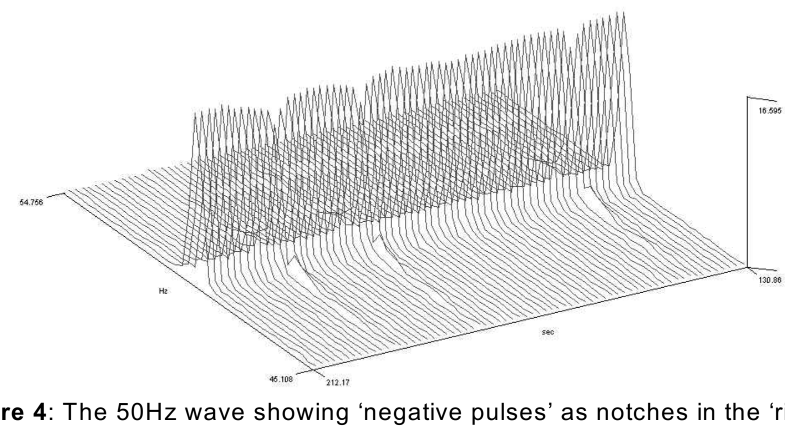

Figure 4: The 50Hz wave showing ‘negative pulses’ as notches in the ‘ridge’

not a plain wave. The overall 50 Hz component varied all the time, presumably as electrical appliances were switched on and off or as their load varied.

There was one particularly interesting, more or less regular, variation to the 50 Hz wave. It was a drop in the overall 50 Hz wave that occurred at intervals that were multiples of 8 seconds. The 'drop' in wave amplitude reached 40 nT. Effectively, the variations amounted to a series of 'negative pulses' of up to 40 nT 'depth' at frequencies up to 0.125 Hz (fig. 4). This nearly qualifies as an EIF. It is possible that on other nights there may be occasions when it does become a genuine EIF. The pulses were stronger in the bed area than at the baseline. They were not seen at all when readings were taken again on the second night.

It was extremely interesting to find such 'pulses' in the overall 50 Hz wave. Though the 50 Hz sine waves are not known to induce hallucinations in themselves, variations or pulses within them, at a lower frequency, might. The brain would not 'see' the plain 50 Hz wave but it would 'see' variations in it. This is important because such variations could potentially occur in many situations where an electrical supply is present. It is thought that in the case of Muncaster the field 'drops' may, in fact, be caused by an electrical device operating in a different phase of the three-phase mains supply installed there. Such three-phase supplies are common in public and commercial premises.

Of course, electrical supplies cannot explain any ghosts seen away from power supplies or before they were installed. This is what made another observation so interesting. The static magnetic fields were measured, among other places, at the pillow centre and foot of the bed. It was noted that there was a huge difference in the static field values between these two points. The magnetic gradient between the centre of the bed and the pillow area was found to be at least 70 nT/mm. So, if someone was sleeping in the bed and their head regularly moved by just a millimetre or two, they could be subject to changes over 100 nT, possibly constituting an EIF. If someone was having a disturbed night this could easily happen! This is irrespective of any varying fields that might be present as well. It would also predate electrification.

The bed in the Tapestry Room is, it turns out, the centre of a large distortion in the local magnetic field! Investigation revealed an iron mesh supporting the mattress (fig. 5). Iron is highly magnetically permeable, which means it will distort any magnetic field nearby. The iron mesh might even be magnetised though, either way, it undoubtedly distorts the local field. Other beds in the castle, which

Figure 5 Jason examines the magnetic iron mesh support to the TR bed

are not associated with anomalous experiences, were checked but were found not to produce any magnetic field distortion. It certainly appears possible that this 'magnetic distortion bed' may be responsible for some anomalous experiences reported by people using it. It is not known how old the bed is, but it is certainly old. Could other similarly designed beds have given people ghostly night-time experiences in the days of candle-lit bedrooms?

Did EIFs produce the haunting?

The results presented here represent only the earliest use of MADS at Muncaster. There is much more work to do at Muncaster, particularly a magnetic survey. For instance, the influence of geology on the local geomagnetic field looks like an interesting area to investigate . Also, factors other than magnetic fields which might cause anomalous reports are being examined. MADS will also be used at other haunted locations in future.

However, we can already see that there are fields looking like EIFs in the TR which are stronger around the bed. The bed is also very unusual as it is magnetic. The fact that it is the centre of the most striking experiences at Muncaster is unlikely to be a coincidence. These initial results already suggest that the magnetic hallucination theory is well worth pursuing.

As for the MADS system, that has proved itself already. The huge number of readings it can produce are excellent for applying statistical methods. The time-linked method of taking readings makes it possible to be sure that differences are due to position, rather than time. By having two sensors it is also possible to get some idea of the extent of any magnetic disturbance detected. There will be further development of the system, mostly involving new software. However, the basic principles have already proved a winner. There really do seem to be EIFs out there, waiting to be found. Many of these anomalies would have been completely missed by the more usual approach of using cheap commercial EMF meters.

References

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