The Green Man

by David Taylor

The Green Man is a familiar figure in church carvings. But what is such a figure doing in a Christian church? And what exactly does it represent anyway?

ASSAP has always endeavoured to embrace all subjects in its ongoing quest to understand the paranormal. A classic example of this has been 'Project Albion' which researched specific locations by studying their folklore, earth mysteries and any paranormal experiences that were recorded there.

A major folkloric theme in Britain is the Green Man. There is a general acceptance that the Green Man is a representation of a pagan deity, but this is not borne out by the abundance of Green Man carvings to be found on or within Christian churches. Could this contradiction be the clue that will lead to our understanding of this archaic figure? Why do we find the Green Man associated with churches? There have been many fanciful ideas. The most popular is that they were carved by stone masons, who were initiates in a pre-Christian 'Old Religion' and created the carvings to ensure the survival of their gods. Nice idea, you may think, but one of the many problems we have with the Green Man as a pre-Christian deity is that there are few archaeological remains that show similar heads. There are Roman carvings that show foliate heads, but these appear to be decorative rather than religious (1). Analysing foliate heads, Anthony Weir and James Jennan concluded '...often they are confused with "Jack-in-the-Green" or "Green Man" motifs...' (2). This is a common mistake to make, especially by those who see the Green Man through romantic eyes and mistake guardians of the forest, green knights and woodwose from folklore as the Green

Detail from Kilpeck Church, Herefordshire

Man, which clearly they are not. A survey of archaic carvings from the Celtic Iron Age shows a lack of evidence for the Green Man as a Celtic deity (3,4).

Of course, there is the famous letter of 601 from Pope Gregory to Abbot Mellitus, a missionary in Britain, that urged the early church to destroy all pagan images. Pagan images were certainly destroyed by the early church, but by no means all of them were destroyed and it would be ludicrous in the extreme to believe that the Green Man was singled out for special attention. As the historical records show, the church destroyed and banned pagan icons, so it was aware what pagan iconography was. Bearing this in mind, it is highly unlikely that the church would have allowed pagan images to be carved on its churches. There is even a contemporary account from St Bernard concerning Romanesque sculptures such as the Green Man, in which St Bernard opposes such sculptures because they are grotesque, silly and expensive, not because they are pagan. Professor Ronald Hutton is also sceptical about the Green Man's alleged pagan pedigree: 'None of these images could have been a beloved pagan deity placed in churches by popular demand' (5). So, what is the Green Man if not a pagan fertility deity?

The medieval genesis of the popular Green Man carvings can be traced to continental Europe. At that time a religious sect was active in Germany. Like all sects it was considered dangerous by the church and moves were taken to suppress it. The Brethren of the Free Spirit (6) were Adamites, an early Christian gnostic sect who believed that mankind's redemption lay in Adam, the first man. The Brethren were considered completely amoral by the church authorities, and it is easy to see why. They believed that they were divine, and therefore above the laws that governed ordinary people. Murder, theft and sexual promiscuity were not considered sinful among the Brethren. They also practised ritual nudity and mystic eroticism, among other things. These practices would have been abhorrent to the church, and so action was taken to stamp them out.

The influence of the Brethren as an important heretical sect should not be underestimated. The Dutch painter Bosch was influenced by their gnostic philosophy (7). In 'The Gospel of Nicodemus', an early gnostic text, it tells how at the death of Adam he was buried with a branch from the Tree of Knowledge in his mouth (8). In Christian mythology the branch grew from Adam's mouth and became the tree from which the wood for Christ's cross was made. Here we have a very early reference to Adam with foliage, in essence Adam as Green Man. This could explain one interesting point: it has been noted by many researchers into the Green Man mystery, most notably Kathleen Basford, that the vast majority of carvings show tortured faces (9). These carvings do not show a joyous expression of nature as some researchers and neo-pagans suggest. Another curious observation has been made by Weir and Jerman who consider the medieval symbolism behind Green Man carvings, which they suggest '...may possibly have symbolised blasphemy, heresy, scandal or evil in general' (10). This theory is also strongly supported by Rabanas Maurus, an eighth-century theologian who said that the Green Man symbolised the sins of the flesh. Could it

be that the Green Man carvings that we find on medieval churches were indeed comissioned by the church, to show the tortured face of a heretical messiah as a warning to the masses about the sins of the flesh and the presumed sins of the Adamites in particular?

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(6) *Pursuit of the Millennium: Revolutionary Millenarians and Mystical Anarchists of the Middle Ages*, Norman Cohn (Pimlico 1993)
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(8) *The Green Man,* Anderson and Hicks (HarperCollins 1990)
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(10) Weir and Jerman op.cit.

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Mindsight

by Ian Fairholm

Scientists are starting to unravel the mysteries of the unconscious. In doing so they have come across faculties that resemble ESP.

There have been considerable efforts in the past few years to explain parapsychological phenomena (eg. telepathy, precognition, mediumship, etc) in terms of ordinary psychological phenomena that have no paranormal or spiritual connection whatsoever. One type of attempt has dismissed these phenomena out of hand, suggesting that they are the result of misguided or fraudulent individuals, poor evidence, or out-and-out shams (eg. Randi, 1991). A second type of explanation has taken a different approach by suggesting that very specific psychological effects may account for many supposed cases of the paranormal. This article will briefly list some examples of the latter type, but emphasis will be placed on a possible alternative explanation for many apparent examples of ESP that reflects recent work done by psychologists on the nature of conscious and non-conscious processing.

Although such explanations do not discount the possible existence of extra-sensory perception, they may explain why so many individuals believe they have had an experience of ESP or 'the sixth sense'. They may also show that we do have incredible abilities but that they are simply not paranormal in nature.

The complexity of the human mind/brain and the fact that there is still very much unknown about its capabilities have led many individuals to postulate that it may be able to produce abilities such as telepathy, telekinesis, precognition, etc. Each of these abilities is beyond the range of normal human sensory experience, hence the term extra-sensory perception or ESP.

There have always been those who are sceptical about the reality of these abilities, and more recently various scientists, particularly those interested in the mind such as psychiatrists, psychologists and parapsychologists, have attempted to explain these supposedly paranormal phenomena in terms of purely natural phenomena. Paul Chambers, for example, has already provided excellent summaries of several such phenomena. Chambers (1999) lists sleep paralysis, hypnagogic/hypnopompic hallucinations, absorption, contagious insanity, the sense of presence, diminished input (sensory deprivation), and autoscopy as examples of rare but relatively explainable and scientifically acceptable phenomena that may be misinterpreted as paranormal phenomena. In his article he also touches on Dissociative Identity Disorder (better known as Multiple Personality Disorder) and has gone into more detail about the possible similarities between the disorder and paranormal phenomena in his *Fortean Times* article 'First Person Plural' (Chambers, 2000). Elsewhere scientists Jorge Martins de Oliveira and Julio Rocha do Amaral (1998) presented a case report entitled 'Paranormality or Psychotic Manifestations?', again suggesting that apparently spiritual or paranormal phenomena may be more suitably labelled as cases of some form of brain dysfunction. This is not to say that the effects that can be observed or the stories that are told are not remarkable, but rather that they are explainable by existing scientific understanding. This article is not going to discuss any of the work just referred to in any greater depth, but references are provided at the end if you wish to find out more.

What have been discussed so far are various suggestions that many paranormal phenomena are explainable in terms of certain psychological and physical conditions. Such suggestions have been around in one form or another probably for at least the last hundred years, even if the precise scientific explanation and terminology may have changed over time. The rest of this article will look at more recent speculations about paranormality based on

cutting-edge theories of consciousness and brain function. Although these theories are commonly formulated using evidence obtained from patients suffering from some form of brain damage, the theories suggest that the implications apply to all of us and may explain some of the mysteries of the so-called 'sixth sense'.

Conscious and Unconscious

A great deal of evidence is accumulating that there are parts of our brain that are responsible for consciousness and other parts that operate perfectly well without conscious processing. For example, visual processing in the brain is split into largely independent streams or pathways. One of these pathways is concerned with the perception and recognition of objects, and it is this stream which provides us with conscious visual experience of the world. The other pathway is responsible for guiding motor action (Milner and Goodale, 1995). This may sound odd, because one of our common-sense notions about vision is that it is a single process.

One suggestion is that the two pathways represent different stages in our evolutionary development, that the pathway responsible for guiding motor action is the older pathway and that it provides us with a kind of early warning system. For example, if a large object looms towards us we don't initially want to spend too much time consciously deciding what the object is, we want to be ready to react to it. As Ramachandran (1998) puts it quite neatly:

'…this older pathway tells me where the object is, enabling me to swivel my eyeballs and turn my head and body to look at it. This is a primitive reflex that brings potentially important events into my fovea, the high-acuity central region of my eyes.' (p.72)

At this stage we want to know what the object is, to know how to consciously respond to it, and this is where the 'newer' of the two pathways comes into play.

There are many examples of individuals who have suffered some form of brain damage that seems to affect their conscious processes but still leaves them with surprisingly intact cognitive abilities. For example:

Amnesia Popularly defined as a total loss of memory but a lot of recent work has suggested that many cases of amnesia actually affect *conscious* memory only (eg. Schacter, 1987). For example, you may well have memories of conscious experiences such as learning to play the piano or knowing that when you were younger a dog bit you. If you were suffering from amnesia you might be unable to remember these events, and thus would have no conscious memory of being able to play the piano or that you were frightened of dogs. However, this might not prevent you from being able to play a piece of piano music presented to you or from being extremely frightened when you next see a dog. Both your ability to play the piano and to still be frightened of a dog are examples of memory, though not of the conscious kind. Someone who was frightened of a dog or could play the piano but without remembering the experience associated with that non-conscious memory might feel at a loss when asked how or why he or she did what they did. An anecdote often presented in the literature (originally reported by Claparede, 1911) will also illustrate the point. Claparede hid a pin in his hand before shaking hands with an amnesic patient. The patient was, from then on, understandably reluctant to shake hands with Claparede, but was unable to explain why. The patient's behaviour suggested that she could remember the incident but had no conscious recollection.

Visual Neglect This is a strange condition commonly seen in people after they have experienced a stroke. It seems to affect the human attentional system and individuals suffering from it neglect or ignore part of their visual field (usually the left side). Patients with this disorder commonly read only one side of written text, bump into objects, put clothes on only one side of the body, and when eating leave food on one side of the plate. Oddly, though, patients suffering from visual neglect can seemingly still be influenced by visual stimuli at some pre-conscious level even though they are otherwise 'ignoring' it. For example, while claiming that two quite clearly dissimilar stimuli are identical they might still answer a question in a way that would suggest some tacit knowledge of the difference (both that there is a difference and what it actually is). (For an example see Marshall and Halligan, 1988)

Blindsight Earlier I mentioned the two visual pathways in the brain, one of which is responsible for visuomotor action and the other for the conscious perception and recognition of objects. When the latter stream is damaged, patients will often appear to be completely blind in part of their visual field. When asked about an object (eg. a stick) in that part of the visual field a typical patient will point out that the question is silly because they can't see the object. However, when asked to guess over a number of trials whether the object is, for example, being presented vertically or horizontally, the patient will more often than not 'guess' correctly (well above chance). This 'blindsight' effect has been reliably reproduced by many researchers and with many different patients (see Weiskrantz, 1996). As Ramachandran (1998) asks: 'Without invoking extrasensory perception, how do you account for blindsight - a person's pointing to or correctly guessing the presence of an object that he cannot consciously perceive?' (p. 76). The suggested answer is that while the visual stream responsible for conscious visual perception and recognition of objects is impaired,

the other stream still functions reasonably or even perfectly well. Information still gets to the brain via this stream, and by using this information the person can interact with the object in numerous ways, including grasping or pointing at it, detecting orientation or motion etc, though importantly without conscious awareness of it.

Now you might want to say that, despite the evidence from these conditions, the effects that can be seen are merely some form of artefact resulting from brain damage, except that such evidence is actually only the beginning. Extensive work with individuals who have completely normal vision suggests that they too may show this distinction between conscious and non-conscious processing of information. One such paradigm is that of change blindness (see Rensink, 2000) where large changes in a visual scene 'become difficult to notice if made during an eye movement, image flicker, movie cut, or other such disturbance' (Rensink, 2000, p. 1469) even though such changes would be readily seen under normal conditions. If you have ever experienced a change blindness experiment then you may well identify with the fact that observers very often report that they can *feel* when something is changing, even though they cannot *see* it. These individuals, then, are seemingly sensing the change without an accompanying visual experience. And these individuals are not just guessing either - catch trials, where no change actually occurs, are included among the change trials, and observers who seem skilled at this 'sensing of change' usually correctly identify the catch trials as not changing (for more details see Rensink 1998, 2000).

A Sixth Sense

Rensink (1998) has dubbed this phenomenon - that some observers can have an abstract mental experience of change but without actual sensory experience - 'Mindsight'. He has suggested that mindsight might be some form of early warning signal, possibly from the visuomotor system. He has also suggested that mindsight might correspond to the so-called 'sixth sense', which is often believed to provide a warning about dangerous situations.

Ramachandran (1998), on the other hand, refers to the non-conscious 'being' that seems to operate independently of our consciousness as a zombie, something capable of making complex and skilled movements but without any apparent conscious thought, much like the creatures in films like 'Night of the Living Dead'. Ramachandran wonders how intelligent our own zombies are, in their own way: he rightly points out that many sports rely on spatial orientation and co-ordination. For example, the skilled basketball player can close his/her eyes and toss a ball into a basket if they stand on the same spot each time. Now this is quite a remarkable feat, though the feat itself (the actual success of repeatedly hitting the target) does not in any way require conscious thought or planning. As Ramachandran points out, in this case and indeed many others in sport and in real life there appears to be some considerable benefit to 'releasing one's zombie', letting it do its own thing without our conscious intervention. Indeed, allowing the zombie to 'do its thing' may be what the mystical and philosophical traditions found in the martial arts talk about when they refer to 'chi'. Such traditions refer to letting go of conscious control and instead relying on instinct, intuition and some kind of mystical force to achieve quite incredible acts. Could these traditions, as Ramachandran suggests, be referring to what he calls the zombie, the non-conscious visuomotor system?

I am not suggesting here (and nor, I think, are Rensink or Ramachandran) that this visuomotor system can enable us to achieve paranormal abilities, but it might, through training, enable us all to perform quite amazing acts of human performance related to perception, memory, balance, co-ordination and dexterity.

Now, of course, this description of the way that the 'sixth sense' and other remarkable abilities may well be explained by the existence of conscious and non-conscious pathways does not rule out the existence of all psychic powers or even particular cases of the sixth sense. It does, however, offer a well-recognised scientific theory as the explanation for many cases of so-called ESP and remarkable acts performed without conscious awareness. These abilities may appear strange, incredible, or even unexplainable, but they need not be in any sense paranormal.

One particular case that mindsight does not successfully account for is the idea of sensory awareness without any apparent sensory input, for example the feeling of being stared at when there is no possible way of knowing that someone is doing so (because they are directly behind you or out of view). This may be a genuine case of ESP, but the evidence for the existence of this ability is not particularly good (see Baker, 2000). I shall not discuss the reality (or otherwise) of this ability any further as it would fill a whole paper in itself. However, it is important to note that this article does not in any way rule out the possibility of ESP and other psychic abilities, rather it offers a reasonable scientific explanation for one type.

One final interesting, not to say ironic, point worth noting is that many people who have speculated on the existence of psychic abilities, particularly the sixth sense, proposed that they might represent an evolutionary development in humans. But if Rensink, Ramachandran and others are right then the explanation for the

sixth sense is that some older evolutionary abilities are still in operation alongside the more recent development of consciousness. The sixth sense may not represent our future but an important part of our past.

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Instrumentation

by Maurice Townsend

Recently there has been an explosion in the use of instrumentation on paranormal investigations. It is now quite usual for an investigation to involve the use of such things as infra-red cameras, digital thermometers and electric or magnetic field meters. But are there any problems with this new widespread use of electronic equipment?

Already the use of instruments is giving rise to new ideas, new theories and even claims for new paranormal phenomena. In the normal course of events this could only be welcomed. But what if some of these ideas actually result from lack of understanding of what the instruments are measuring? We would be in danger of going down more blind alleys, which is the last thing our subject needs right now. That is what this article is designed to forestall.

Many of the physical quantities now being routinely measured on investigations are little understood by non-scientists. As an illustration of how complicated these things can be, I will concentrate on one particularly popular area in investigation: electromagnetic field measurement. This example can be generalised to other areas as a general approach to the whole subject. Hopefully it will lead investigators, particularly less experienced ones, to profit from the use of instrumentation while avoiding the pitfalls.

Why use instruments?

For over a century paranormal phenomena have been studied more or less scientifically. And yet there are still many scientists, not to

mention a large section of the general public, who do not believe such phenomena even exist. Clearly the phenomena are highly elusive. But still the general public report anomalies and still they cry out for explanation.

On the defensive for so long, many investigators content themselves with 'proving' that something paranormal has occurred in a case they are researching. They do this by proving that something 'cannot have happened by any known normal means'. This rather negative process is always open to the problem that someone will one day discover just such a 'normal means' to retrospectively explain the case. What is even worse, such an investigative process makes no great attempt to find out how paranormal phenomena might actually work.

The trouble with most cases is that they are based purely on the evidence of what someone witnessed. We know enough about the unreliability of witnesses to realise it is difficult to build a solid theory on such evidence. People are sadly, for a variety of reasons, not reliable recorders of their surroundings. What is really needed is objective, corroboratory evidence.

This is where instrumentation comes in. It is one thing for someone to claim they saw a ghost. It is quite another for them to produce a photograph of one. While people are subject to innumerable influences, both physical and mental, that are still barely understood, a camera is a known quantity. We know its capabilities and its limitations. Also, a photographic negative can be studied at leisure after the event. Someone's experience can only be accessed through their, often faulty and changing, memory, which cannot (yet) be put into a laboratory and analysed.

There is another important limitation to witnesses: they only have (arguably) five senses. Instrumentation can probe into all sorts of

environmental influences that we, as humans, cannot detect. There is the whole of the electromagnetic spectrum, infra- and ultrasound, radioactivity, gases in the atmosphere, magnetic and electric fields, etc.

These environmental influences are important because they might:

a) be the cause of some paranormal phenomena
b) be misidentified by witnesses as paranormal
c) cause witnesses to hallucinate 'paranormal' phenomena
d) actually be produced BY paranormal phenomena

The last point is not often considered by researchers. For instance, some people think that poltergeist phenomena are produced by people somehow causing physical changes to their environment. Such changes cannot be readily explained by current physical theories. However, one commonly observed factor in physical processes is that they are rarely, if ever, 100% efficient (eg. a light bulb produces a lot of heat as well as light). If a paranormal phenomenon is capable of teleporting an object (such as an apport), which would require a lot of energy, it might result in an accompanying burst of 'waste' electromagnetic radiation. This would be a byproduct of the main process, like the waste heat from power stations. If such phenomena really occur, we could try to detect any 'waste' radiation that might accompany them.

So, what are the problems?

From the previous section I hope it is clear that, in terms of verifying and possibly explaining paranormal phenomena, instrumentation brings enormous advantages to investigations. Inevitably, though, there are problems. It has, for instance, been noted that introducing instrumentation to an allegedly haunted location seems to dampen down the phenomenon (which is worthy

of research in itself). Unfortunately it lends itself only too readily to the sceptical argument that 'people who are faking are less likely to do so if they think they will be caught by instruments'. While such things doubtless happen occasionally, on vigils often the only people present are investigators, who have nothing to gain from faking phenomena.

Far more serious than phenomena being 'dampened down' is the problem of misunderstanding the equipment itself. Few investigators are likely to be trained scientists and therefore cannot be expected to understand the limitations and proper use of their instruments or even necessarily what they are measuring. It is this gap in understanding that is at the root of the biggest potential problem with instrumentation. It could lead to unjustified claims of explanations for paranormal phenomena or even 'new' anomalies. Luckily there is a cure to this problem - a proper understanding of the instruments and the quantities they measure.

Understanding what you're measuring

Unfortunately, it is necessary to have some idea of what you are measuring before you can decide what is normal and what abnormal. In the case of electromagnetic (EM) radiation it all starts with the humble electron. This is the particle that orbits atomic nuclei to form atoms. When allowed to flow freely, as in electrical conductors such as metals (where outer electrons are only loosely bound to their atoms), they produce an electric current. Such electric currents produce a magnetic field (eg. there will be one around a mains cable).

When two objects are brought together and then separated, temporary molecular bonds are formed and then broken. This process leaves more electrons on one object than the other. This produces static electricity. The excess (or deficit) of electrons gives

rise to electrostatic fields (ie. constant fields which do not vary in strength). These fields produce a force that can move very light objects that are also charged (eg. small bits of tissue paper). Such electrostatic fields cannot move heavier objects, because when their strength reaches a relatively low level (3000kV/m) the surrounding air is broken down and becomes conducting, producing a spark which discharges the field. Such sparking produces ozone with its characteristic smell.

Electrons also give rise to static magnetic fields. When electrons in certain materials 'align' they produce a strong static magnetic field. The best known example of this is iron (and some alloys such as steel) which can form permanent magnets. The Earth has a static magnetic field produced by processes deep within its core. The effect is the same as a weak permanent magnet. Though generally stable, the Earth's magnetic field does vary, particularly during electromagnetic 'storms' (when unusually high numbers of energetic particles are spat out by the Sun). Static magnetic fields produce a force that can move objects. Unlike electrostatic fields, there is no limit on how strong static magnetic fields can get (though strong fields are extremely rare in the natural environment). Their effect on other materials varies hugely. Iron and its alloys are affected strongly, whereas most other common materials are not.

Both static electric and magnetic fields produce a force that can move objects in a particular direction characteristic of the field. This gives rise to the concept that an EM field has a direction, as well as a strength. It is what makes compasses point north. So if you are studying static EM fields you need to measure both strength and direction at any given point in space (and ideally plot both on a plan). Static fields, whether electric or magnetic, are sometimes collectively referred to as DC. This, confusingly, stands for direct current, a reference to how they might be produced.

When electrons move (eg. in electrical conductors) things really get interesting. The motion of the electron gives rise to a magnetic field. Similarly, a conductor moving in the field of a permanent magnet will induce electrons to move inside it, so giving rise to an electric current (as happens in an electric generator). Such varying or moving electric or magnetic fields are sometimes collectively described as AC (for 'alternating current' - a reference to the equipment that commonly produces them).

It is important to note, though, that moving fields cannot usually move objects. If you think about it, it is obvious. Imagine a small magnet in a magnetic field that is changing direction five times a second. The magnet will try to move in opposite directions five times in a second. It is not likely to get very far. When you take inertia into account, it is unlikely to move at all.

By varying electromagnetic fields you introduce another variable to record - frequency. This is measured in Hz ('times per second'). This is the number of times a field reverses direction per second. As this frequency increases, the fields behave less and less like fields (with force and direction) and more and more like waves (with no force and much greater range). This is electromagnetic radiation. Over about 100kHz radiation predominates and the waves are known as radio waves. At higher frequencies still radiation changes characteristics again to become such things as light, X-rays or gamma rays.

This brief discussion is, of course, a highly superficial summary. It is merely intended to give instrument users a flavour of the complexity of the physical quantities they are studying (without even considering such things as field gradients or polarisation). It would certainly benefit anyone using electromagnetic detectors to read up these subjects in advance of going into the field.

Measuring Varying (AC) Fields

Most commercially available electromagnetic detectors are aimed at the 'EM field pollution' market. They are typically designed to detect sources of electromagnetic fields (that some scientists believe could affect health) in domestic and commercial premises. Most are sensitive to 50-60Hz fields typical of mains electricity supplies. Others are often designed to look for microwaves (eg. from cellphones and leaky microwave ovens) or for inadvertent radio emissions from electronic devices (such as PCs). Unfortunately, it is not possible to design instruments to detect EM over the whole, or even a large chunk, of the entire frequency range.

There is an immediate problem here. All of the frequency ranges mentioned above are most often produced artificially. There are very few natural sources of such frequencies. For radio and microwaves the main natural sources, from space and the upper atmosphere, are extremely weak. There are some natural sources for 50-60Hz waves (known as ELF - extremely low frequency), such as lightning, but they are few and far between. Before the advent of mains electricity these frequencies were very quiet. If you take an ELF meter into the countryside or even a town park you will not record much (except near overhead lines or during a thunder storm)! But many phenomena we are investigating have been reported for centuries, long before such artificial sources of EM radiation. It is therefore unlikely that such frequencies are involved in producing them. It is, of course, possible that new kinds of anomalous phenomena may be associated with artificial sources of EM radiation. But certainly ghosts, poltergeists and the like long predate electricity generation.

Having said that, it is still worth owning one of these 'EM pollution' instruments as it could provide a natural explanation for a phenomenon. For instance, modern artificial fields might

conceivably produce phenomena that resemble paranormal phenomena. Their detection could thus point to possible natural explanations for a reported phenomenon.

There are, however, further things to bear in mind when taking readings with these instruments. There is, for instance, the question of whether readings are what they seem. Remember that 'EM pollution' detectors are often most sensitive to 50-60Hz electric or magnetic fields. However, most instruments will also be sensitive, to a lesser degree, to other nearby frequencies. So if you got a reading of 5 microteslas on a meter, it could be indeed be 5 microteslas at just 60Hz. But it might be 10 microteslas at 30Hz which, because the meter is less sensitive at that frequency, it reports as 5 microteslas. Most likely of all it will represent an average over a broad range of frequencies. So it is difficult to say exactly what such a reading of 5 microteslas represents precisely.

Ideally, for varying fields, you should use a detector that incorporates some kind of spectrum analyser. It would then be possible to produce a graph of field strengths against frequency. Such an instrument would be really worthwhile! However, it would not be cheap. Alternatively, you could always build something from reasonably cheap components if you have a good practical understanding of electronics.

Measuring Static (DC) Fields

You can get detectors to measure static fields, though they tend to be expensive. Static fields are definitely produced naturally and so might indeed be associated with long-reported anomalous phenomena. The most pervasive source of magnetic fields is the Earth's field. It tends to be fairly constant at any particular place (except during solar storms). Other significant natural sources of static magnetic fields include certain minerals, such as magnetite.

There are many natural sources of static electric fields. Just rubbing two objects together can build up charges. We are all familiar with getting minor shocks when touching metal objects. Lightning is also a natural source of static electric fields.

If you have trouble getting hold of cheap static electric and magnetic field detectors, you can at least use a humble compass to indicate the presence and direction of static magnetic fields. If, when you walk across a room in a straight line, the compass needle rotates it will indicate the presence of a local magnetic source. Unfortunately it will give you no idea of the strength of the field. A strong static electric field may be indicated by a smell of ozone (though this is more likely to be produced by malfunctioning electrical equipment). Again, a cheap meter could be built from commercially available components.

Apart from magnitude, static electric and magnetic fields also have direction. This is more difficult to measure than magnitude. It would determine which way an object might move if subjected to a strong field. You can measure the direction of static magnetic fields with a simple compass.

I have mentioned objects (particularly iron-based alloys such as steel - not most iron compounds, incidentally, as the electrons are arranged differently in them) being moved by magnetic fields. No doubt some people will immediately think of objects flying around in poltergeist cases. Before you get carried away with the idea of static magnetic fields causing poltergeist phenomena, I ought to put the idea into perspective. The strength of fields required to move even iron objects is far higher than would occur in most natural or domestic situations. To levitate even light (of the order of grammes) non-iron based objects (poltergeists don't seem to mind what their target objects are made of) takes static magnetic fields in the order of 10 or more tesla. That is a huge field strength that would

normally only be seen inside a specialist laboratory (a magnetic resonance imaging scanner, for instance, works at a few tesla). By comparison, the magnet in a typical loudspeaker might be a few thousand microteslas and the Earth's magnetic field 50 microteslas. Incidentally, if there were such a huge magnetic field loose in a house it would have a few other noticeable effects, eg. wiping magnetic tapes and credit cards, ruining television sets and watches, make electronic switches (based on relays) stick and probably cause severe damage to the electrical supply equipment in the building.

What is normal?

Before going into a real-life investigation it is important that you get to know your instrument. In particular you should satisfy yourself that it is correctly calibrated (ie. giving accurate readings) and that you know what to expect in 'normal' situations (ie. where no anomalous phenomena have ever been reported).

For calibration you usually have to rely on the manufacturer. However, if you can get hold of 'standard' comparisons (ie. sources of known field strength) it should give a reasonable level of confidence. Many meters will come with examples of the sort of readings you can expect in domestic situations. If you are getting something wildly different you may need to return the meter to the manufacturer for checking or replacement.

If your instrument does not show any figures but only the 'presence' of fields (eg. by way of a light being on), I'm afraid it is of limited use in investigations. Such instruments are designed to see if fields exceed a particular threshold. Unfortunately, even if you know what this threshold is, you cannot tell if the field is twice or three times that value or indeed half as much.

One important tip is that most electromagnetic meters are sensitive (even AC field ones) to static electricity and YOU are a potent source. Therefore, put the meter down and don't touch it for, say, 10 seconds. The reading should then stabilize and will probably be a lot less than when you are carrying the equipment around. This will be a much truer reading, and you should always use meters in this way.

Having calibrated your equipment, you must now work out what are 'normal' readings. Only with such knowledge can you possibly judge what is 'abnormal'. While it is possible to find out typical values from various sources (try the world wide web) it is best to find out for yourself with your own instrument. This is particularly important with AC fields. Different instruments have different frequency responses. Most standard tables of field strengths produced by mains appliances or overhead cables are for 50 or 60Hz. Your instrument may be sensitive to a much wider range of frequencies. In addition, non-mains-powered electrical equipment may produce stray fields at different frequencies. How do you know what to expect from, for example, portable (battery-powered) appliances, transport vehicles or transmitting equipment? Some equipment, such as computers, can transmit high frequency waves unintentionally. The best way to find out is to measure it for yourself.

A particularly useful technique is to check similar locations 'after the event'. For instance, if you go on a vigil to a pub and find a potent source of AC fields in the cellar, it might seem highly significant (especially if a ghost has been seen there). But might not most pub cellars have similar readings? There are often pumps and other heavy electrical equipment in pub cellars. So try to go to a few others, not known to be haunted, and see if they give similar readings.

When on an investigation it is, of course, most important to identify the sources of any electromagnetic fields. Usually this can be done visually (simply looking for electrical equipment). Sources may not, however, always be obvious. They could be behind walls, eg. mains cabling which emits magnetic fields. If you cannot trace any source internal to a building you might try switching off the power to a room, or even the whole building, to see if the field drops. I hasten to say this should only be done with the permission of the building owner or manager. Even if they agree you should consider if switching off all the power might disrupt permanently powered equipment, timeswitches or machines sensitive to powercuts, such as computers. If you CAN get the mains switched off, you might be able to locate any external sources of electromagnetic fields.

As a very general guide, here are some examples of the sorts of fields you might expect. Many appliances produce 50/60Hz AC fields, as you might expect. As a result a typical domestic room, away from appliances, may have up to 0.4 microtesla AC magnetic fields in it and maybe a few tens of volts per metre AC electric. Obviously, near appliances the readings can be much higher. Fields drop off with increasing distance from sources according to the 'inverse square rule'. This basically means they drop off rapidly with increasing distance. Very close to an appliance the readings can be quite high. At a distance of 15cm some appliances may yield as much as 100 microtesla (magnetic), though less than 10 is more typical. At a metre away many appliances will be undetectable. Electric readings may rise to a 1000 volt/metre close to some appliances, though much less further away.

Static magnetic fields are rarer than varying ones in domestic situations. The Earth's magnetic field will be present (unless shielded somehow - eg. by metal in walls) but it is very weak, between 30 (at the equator) and 60 (at the poles) microteslas. Various household devices have permanent magnets in them, eg.

loudspeakers or anything with a motor of some sort in it. Some appliances also contain electromagnets (eg. as relays) that produce static fields when activated. The magnets in these devices will be much stronger than the Earth's magnetic field but still usually far too weak to, say, move even a nearby light iron object. Typical values for such devices might be a few thousand microteslas.

Static electric fields in domestic situations are usually caused by friction. It can depend heavily on the type of materials used in the room. A typical room might produce up to around 5V/m. If a thunderstorm was going on outside it might be up to 100V/m.

Using meters outside tends to give very low (or nil) readings due to the low density of natural or artificial sources of EM. At a distance of 15m a 500kV overhead power line only yields typically between 3 and 6 microteslas (magnetic). Interestingly, if you live near overheadpower lines you are likely to receive higher field exposure from your domestic appliances than from the power lines (though, of course, most appliances are only used for short periods whereas power lines are always on).

Infrasound

Though nothing to do with electromagnetic fields, I must mention infrasound. This is because it has recently been discovered (see *Journal of the Society of Psychical Research*, volume 64.3, number 860, July 2000) that infrasound with a frequency of 19Hz can induce feelings anxiety and dizziness. If this frequency is present at significant levels (eg. as a resonating standing wave) it could produce reports of hauntings (eg. feelings of a 'presence'). This is certainly something we should look for on investigations.

Comments

This article merely scratches the surface of the issues involved in using instrumentation on investigations. While it is not the intention to discourage anyone from using instrumentation, I hope the article has illustrated the complexity of the subject. I hope it will make people think a little before making claims based purely on apparently abnormal instrument readings.

Units

The units used in electromagnetic field measurement can be confusing. Firstly, if the field is varying you will need to specify the frequency being measured in Hz (ie. per second). Electric field strength, whether varying or not, is measured in volts per metre or V/m. Magnetic field strength (strictly speaking, flux density) is usually quoted nowadays in microteslas. Unfortunately, many people use the older unit of the milligauss, which causes endless confusion. Please stick to microteslas if you can. To convert, 10 milligauss = 1 microtesla. Incidentally, the units gauss and tesla are not commonly used as they are both very large by everyday standards.

Letters

From Roger Downham

J

I would like to make some comments on the latest ASSAP mailing (May 2000): the first two points are fairly minor, but the third is more fundamental.

1) In *ASSAP News* on P.3 Phil Walton gives some astronomical data, in which he says: '[In summer...] as the glow from the sun dies on the western horizon and twilight starts to fade, a glow starts again in the east.' This is not correct. In Britain the mid-summer sun sets in the north-west, and the twilight glow travels around the northern horizon until the sun rises again in the north-east. (This is seen down here in the southwest, but is much more noticeable in the north of Scotland, where one can read a paper at midnight!) If ASSAP is to live up to the 'scientific' in its name, we should get the facts right.

2) In *Anomaly* vol. 26 there are two stories about hauntings, both of which are peppered with the comment '[pseudonym]' after proper names. Personally I find this irritating - surely a blanket statement at the beginning of the article would suffice?

3) This point is connected with (2) above, but goes much further: is the use of pseudonyms in ASSAP literature absolutely necessary - in fact, is it counterproductive? I quite understand that some witnesses request privacy, and I agree that we should respect that, but frequently the use of pseudonyms wraps a story in a sterile cocoon with no possibility of feedback.

Take the haunting stories in Anomaly as an example: I or other ASSAP members may ourselves have been to 'Bridgeford University', or know other people who have, and thus be able to comment on the story. Such comments could provide additional evidence of paranormal happenings, with the possibility of follow-up investigations. Alternatively, someone might be able to say something like 'Is Sheila actually Miss Flossy Airhead? My mates were at Uni with her, and they were always making up stories to spook her, she was so gullible!'

In the story of the 'Potters' at 'Bell Farm', the investigation apparently started as the result of a newspaper report, so the identity of those concerned would be public knowledge in any case. The insistence on using pseudonyms here rather smacks of a secret society using its own private code-words, rather than a scientific society conducting verifiable investigations. The author, Stephen Hall, writes: 'I later found the story of Luke Marchant and his apparition in three of my own books.' Yes; and probably other members of ASSAP have those books, and other resources, and could shed further light on the affair, but with no references to follow up everyone (apart from the core investigation team) is left in the dark.

I have been a member of ASSAP for over 5 years, and this point has been niggling away at me for some time now. Much of the material in ASSAP mailings leaves me feeling 'So what?'; half an hour later I have forgotten about it, because there are no real facts to anchor my memory. If others are affected similarly, it could have a detrimental effect on membership: intelligent, educated adults do not want to be treated like children and only told 'what is good for them'. I suggest that a serious debate on this policy of always using pseudonyms is in order.

Reply from the Editor of Anomaly:

I agree that the use of '[pseudonym]' can be distracting. However, not all names given in *Anomaly* are automatically pseudonyms, so it is used to distinguish those that are.

The use of pseudonyms IS absolutely necessary in ASSAP publications. When we conduct investigations, we guarantee that pseudonyms will be used in publications. This allows us to both investigate and publish the case fully and frankly since witnesses have the confidence that they will never be identified publicly.

It is true that some people willingly go to the media to report their experiences. The traditional fear of ridicule seems to have been replaced by a desire for celebrity of late. Even though the witnesses themselves may have no fear of public ridicule, they may not be able to count on the attitudes of employers, landlords and others who could potentially cause them problems.

In ASSAP investigations secondary witnesses are routinely sought as part of the research process. The uncorroborated report of one individual will never be accorded the same weight as that of a group of independent witnesses.

From John Radford

I am grateful to William Eyre (*Anomaly* vol. 26) for putting an alternative to my thesis that human beings do not survive death. I did write somewhat dogmatically in the hope of stimulating discussion. However, I am not convinced by any of his arguments.

He asks what research I refer to. I mean research showing that when the brain is damaged or deteriorates, mental functions

correspondingly are lost. If brain loss is permanent, then so too is mental loss. Conversely, precise mental functions can be correlated with activity of the living brain, and can indeed be induced by appropriate stimulation. There is no reason to think otherwise than that the brain is the essential substrate of the mind.

William Eyre cites two examples of evidence of non-physically related mental activity, or of life after death (I take it the first is a precondition of the second).

Both are anecdotal, and cannot be verified. However, taking them both as literally true, very simple explanations present themselves. In the first case, a blind person saw relatives in another room. The most likely suggestion is that what was experienced was unusually vivid imagery (which is not lost when a person loses their sight), triggered by other sense cues, probably sound. In the other case, a medium's face was 'moulded', and a number of people afterwards recognised this as the face in a photograph. Numerous experiments show how easily people (in this case, a group of sympathetic persons) can quite sincerely believe they have seen something that in fact they have not seen - especially when emotions are aroused, as reported in this case. Neither case can be regarded as scientific evidence, in the complete absence of any controls.

I have heard of the work of Pearson, Crookes and Lodge. But later discussions of it by other scientists lead me to discount it.

However, although unconvinced, I applaud the determination of spiritualists to seek evidence rather than relying on mere belief.