



Analysis of footage of alleged Mains Hall ghost

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The aim of this report is the analysis of an extract from a video recording made during the filming of an episode of Living TV’s *Most Haunted*. Special thanks are given to the production company, Antix Productions, and Karl Beattie & Yvette Fielding for supplying, and giving permission to analyse, the footage. The short video extract shows a moving anomaly reported as a ‘ghost’ on the televised show. The analysis will attempt to determine either the actual cause or the most likely cause(s) for the anomaly.

Evidence

Location: Mains Hall, Little Singleton, Lancashire.

Date: 3rd July 2005 (*date of filming*), 10th September 2005 (*date of 1st broadcast*)

Recording Equipment: Sony Camcorder, Model ref – IJ4590, set to ‘Nightshot’ mode.

Format & condition: Extract supplied on DVD disc.

The video is approximately a 1 second extract taken from the original recording. The file size is 1.25Mb at 8Mbps which indicates that additional compression has been applied to the extract at the time the file was written to the DVD disc from the original miniDV tape. Assuming that the camera utilised the standard DV25 codec to make the recording then the original extract would have required approximately 3.5Mb for the 1-second extract at a data rate of 25Mbps. This additional compression has resulted in some further loss of overall quality and resolution. The footage is shot using the 16:9 widescreen format with an overall image dimension of 720 x 576 pixels. The analysis is conducted solely on the basis of the selected extract which is further supplemented by examination of the full unedited sequence.

Description of video

The footage is taken with a hand held camera. The opening shows a window to the right side of the shot set within a bare brick wall. Only the central portion of the overall frame is illuminated by the Infrared LED’s built into the camera, most likely situated just below the lens. There does not appear to be any other form of illumination in use or visible through the window.

Using the standard 8” brick size as a guide it is likely that the camera operator is within 2 - 4 ft of the wall containing the window, it is not possible to make a better estimate as the lens focal length and the use of any wide angle or telephoto adaptors is not known.

The actual anomaly is also greatly out of focus – the camera is focussed on the window and the adjoining wall several feet away. In a low light situation the camera is also automatically selecting a wide lens aperture. This reduces the lens Depth of Field to only a few inches either side of the point of focus. Any object that falls outside this Zone of focus will therefore be completely out of focus and poorly defined.

The camera is being panned to the operator’s right, the initial traverse being smooth and controlled. Immediately after the window passes centre of the frame an object is seen to descend rapidly toward the right bottom frame edge. After a fractional pause the camera operator reacts suddenly to the



object resulting in a slight upward jerk before resuming the right pan and making an exclamation. The extract ends showing one of the male crewmembers from the mid torso to above their head.

For the purpose of this examination we will only concentrate upon the actual observed anomaly and will make no further comments about any other part of the video unless it is relevant to the determination of the anomaly's nature or cause/s. To aid the examination it is intended to use a series of supplied captured still frames in addition to the video file itself.



Enhancement & Analysis

Each individual captured video frame is actually made up from two separate interlaced or interleaved pictures. This means that any resulting object can either appear to be larger than it really is or can sometimes appear to be 'doubled' making the subsequent interpretation more difficult. Using a good quality image editing software package such as Adobe Photoshop the two interleaved pictures can be separated with minimal loss of quality, the process is known as deinterlacing.

This then provides two still frames (one for the even lines and the other for the odd lines) for each captured video frame. Each of the 'new' frames providing a better defined image of the anomaly – without this step it is possible that the analysis would be in error as the image would appear quite different to how it was in reality.

It is not necessary to carry out any further enhancement at this stage in order to be able to come to some early assessments about the nature of the anomalous object.



1. It is extremely unlikely to be an insect or other animate object as it does not appear to alter its shape between frames – insects normally beat their wings and this has the effect of altering the overall shape as it appears in the video frames. There is no evidence that the object is changing its overall shape from frame to frame and thus it is highly unlikely that it is a winged insect such as a Moth or Fly.
2. The object appears to take the form of an elongated filament with a wider region toward its centre. Overall the object is in the shape of an extended letter U. The right hand (as seen by the observer) filament is further from the camera and so is not reflecting as much light and therefore is much harder to discern.
3. It is probably heavier than air as the object appears to be descending steadily throughout the entire video sequence. This does not exclude the possibility that the object is of sufficiently low mass to permit it to be carried up or down by movements of the air or by thermal currents within the air.
4. It does not appear to be self-luminous, the overall brightness is fully consistent with it being fully illuminated by the Infrared lights on the camera. These are located normally close to and slightly beneath the lens and any object that is close to the camera will appear to get brighter as



it both nears the camera and approaches the bottom of the visual field and is therefore closer to the source of the illumination.

It can also be seen that the object is also partially backlit by the infrared light from the camera being reflected back toward the lens from a portion of the window frame that is directly behind the object.

5. The object may be translucent or partially so, as the background is visible through the object in the peripheral regions where the brightness is low enough not to have burned out all picture detail. This translucency may also result from the poor subject focus. The more out of focus an object is the easier it is for image rays from sources behind to appear to pass through.

Enhancing the images

The next step of the analysis is to attempt to try and enhance the object to see if it is possible to deduce from its shape a better idea of what it may be. Any enhancement carries an inherent risk of the subject being altered excessively and in effect creating something that never existed. Therefore any adjustments should initially concentrate solely upon making subtle alterations to the levels of contrast and brightness.

In this case this basic step yielded poor results – the IR lighting from the camera was being reflected back from the window frame directly through the object, burning it all the potential information, increasing the contrast ratio merely exaggerated this problem.

Instead it was decided to use a method of image overlay – where in effect hundreds of copies of the original image were laid over each other using the computer to maintain perfect registration between the image copies. This technique was used by analysts working on the famous video footage shot by Tim Dinsdale of the Loch Ness monster, and yielded additional detail in that case.

The enhancement was made with specific regard to obtaining the maximum amount of detail in the filament arms. Like many stages in photo analysis this is a subjective process and I (*Steve*) have used my own judgement in setting the levels of adjustment.

For the best chance to get some information from the enhancements I have concentrated purely on making adjustments to the object. The rest of the picture will also be altered by the same degree and this accounts for the minor variations in the background lighting and intensity between the images.



Finally, to make the transition of the enhanced object more easily viewed from frame to frame the resulting images were then joined back together to create a slow motion animation and a partial reconstruction of the original video clip. This process involves a very slight loss of image detail in the process of writing the video file, but this amount is insignificant and can be disregarded for the purpose of this analysis.



The resulting file was then saved in a format that can be viewed on any Windows PC – *file called 'Animation'*.

Comments prior to Conclusion

Analysis of any video footage is always a more difficult process than working with still pictures. Video uses completely different techniques to record the moving images; wherein individual frames are woven together to ensue the eye 'sees' continuous motion. Video resolution is also very much lower than still photography with a lot less pixels per frame being needed. This means that the CCD's used in video cameras are typically very much lower resolution (often less than 1 mega pixel) than are normally to be found in digital cameras (typically 3 mega pixels or more). For 35mm film pictures the effective pixel count are over 35 mega pixels.

Night vision video uses the fact that CCD's are much more sensitive to IR light than film or the human eye. It also requires a great deal of electronic amplification (gain) to be applied to the output from the CCD to make the image suitable for viewing. The amplification that is applied has the effect of reducing the definition of the footage, which is why night vision video footage always appears to be grainy and poorly defined. This also reduces the opportunities for a full analysis to be made. The stages of turning the video footage into useable stills means that the interlaced images must be separated reducing the quality and definition a little more.

Enhancement is a process that if not applied carefully can result in the operator 'adding' information where non existed or removing information that again may affect the image definition. Enhancement is also a subjective process.

Many people perceive image enhancement as a process that can create detail where none was visible, sadly this is an idea given to them by Hollywood and the reality is that enhancement may allow the operator to wring some slight additional information that will allow him / her to make a better estimation about the nature of the object.

Analysis is also a subjective process. It uses the image together with the operator's skill and knowledge the camera and also of a wide range of the variables that may be operating within the picture. It must always be remembered that despite the advent of computerised methods it ultimately the operator who makes the decision about what he 'believes' is contained within the picture or video.

Conclusions

From previously:

1. The object is inanimate.
2. The object is heavier than air.
3. The object is not self-illuminating.
4. The object is translucent.
5. The object seems to be in the form of a filament with a possibly bulged central region.

Sadly, the enhancements carried out did not reveal any substantial extra information regarding the nature of this object. They did however; make its overall form somewhat clearer and more defined. From the footage alone there is little more to be said about what the object may be.



With the addition of some information gained from the footage and knowledge about the circumstances of it being taken, it is possible to say a little more:

The location appears to have bare walls. There is at least one other person present at the time the video was shot – they are visible at the end of the sequence. More people may also be present although they are not seen in the video footage.

The footage was shot as part of the making of a TV programme which inevitably requires a number of people to spend a considerable period of time setting up and moving equipment around – this could have the effect of disturbing and dislodging dust and debris allowing it to float around and into the vision field of the camera.

Although the object is not an insect as it is inanimate it is also possible that it is the product of an insect or spider. Spiders frequent many locations and they move around using spider silk as a means of securing themselves.

These spider silk threads are sticky and often accumulate dust particles to form cobwebs, these are a feature of many locations and may appear quite quickly regardless of the cleaning regime. This is supported by similar cobweb-like objects coming into frame later in the unedited film sequence which do not feature in this analysis.

What is the anomalous object?

Given all the above information and the appearance of the object within the video footage the balance of probabilities strongly favours the anomaly being a piece of cobweb or spider silk dislodged or disturbed by a person present during the filming.

The sudden appearance of the object is a function of the way that the Nightshot vision mode works. The cobweb is only visible when it comes close enough to the camera to be illuminated by the IR lights beneath the lens, as it's path takes it closer to the camera this illumination becomes stronger and so it appears both larger and brighter.

Even more brightness is added to the object as the light from the IR lights on the camera are reflected back to the lens from a reflective region of the window frame, the effect of this backlighting combined with the direct reflection of light from the object increases it's apparent size still further.

There is an additional and interesting aspect to the light 'bouncing' off the window frame – it appears that the object 'flashes' momentarily and it is at this point that the cameraman reacts strongly – perhaps surprised by this sudden increase in brightness as he views the scene on the camera's viewfinder screen. This may have some effect on his subsequent perception of the object.

The camera is focussed on the wall in the near distance and the lens aperture is fully open to maximise the light transmission to the CCD, this results in the object being greatly out of focus – again making it appear larger than it really is.

One final clue perhaps that regarding the nature of the object comes from observing the way that the illumination of the object changes during the sequence of images. At the start of the sequence, it is only the lower portion of the object that is being lit by the camera's lights – the two upward filament arms being almost invisible, as they are not being illuminated by the narrow beam of IR light. As the object nears the camera and thus the lights the central region starts to reflect the camera light



strongly and becomes 'burned out' losing all definition, the 'arms' by this time are starting to be illuminated and the object becomes more U shaped.

Finally, unable to track with the object's motion the camera loses the object out of the bottom of the frame and it can be seen in the final frames that the previously poorly defined filament strands are now strongly picking up the light from the camera's IR light and can be seen to strongly illuminated at the base of the frame – where it is nearest the camera's lights.

Despite the balance of probabilities, the analysis and the confidence of the authors in their conclusions, they recognise that the analysis cannot be considered absolute and that there is scope for other explanations to exist.

Notes:

The Sony 'Nightshot' mode utilises the increased sensitivity of Charge Coupled Device (CCD) imaging chips to Infrared light. Normally additional optical and/or electronic filters control this sensitivity as it can adversely affect the overall colour balance of the final visible light imagery. Sony discovered that by turning off these filters and by the additional use of one or two infrared illumination LED's they could make video camcorders that were capable of producing reasonable quality images in very low light situations. Images are monochrome with a green cast for increased contrast and typically quite low resolution as less than 50% of the total available CCD pixels are used to make the final image. Other manufacturers used a similar technique initially but later were forced by Sony Patents to use a less satisfactory method using a combination of slow shutter speed and visible light LED illumination.

MiniDV: Also referred to as "Regular DV" "Consumer DV" or just "DV," MiniDV is the most common DV tape format. MiniDV provides the most universal playback compatibility. MiniDV tapes can be played in any DV device (including DVCAM and DVCPRO), while many MiniDV devices can play all three formats. MiniDV, as its name implies, uses only the small DV tapes. Note that while the small DV tapes made by Sony are often marked DVCAM and the tapes made by Panasonic are often marked DVCPRO, it is the device that determines which format is recorded; the tapes are identical. So if a Sony tape that is marked DVCAM is used in a MiniDV camera, the DV data will be recorded as MiniDV.

DV25 is the codec used to compress all video that is recorded onto a MiniDV, DVCAM, and DVCPRO tape. This compression occurs when the information is written on the tape. People often refer to "uncompressed DV," which is a bit of a misnomer. DV is always compressed; it's just a very light compression. There is no way to record onto a DV tape and not have the information compressed into the DV25 format. "Uncompressed DV" usually means that no additional compression is added during the capture process. A better term that is often used is "raw DV."

DV25 Compression Specs:

Compression Ratio: 5:1 This ratio seems rather high when compared to the fact that analogue video usually had to be compression at a 3:1 or 2:1 ratio using Motion-JPEG to be of acceptable quality. Yet DV25's 5:1 quality is about comparable to 3:1 Motion-JPEG quality. This ratio is fixed.

Data Rate: 25 Mbps This is why it is called DV25. This data rate is both fixed and constant. It does not matter if the video is a high action sequence or is totally black, its data rate will always be 25Mbps. While this can be inefficient, it also makes it easy to predict how much space an amount of video will take up on a hard drive. Some useful figures (sizes are approximate):

1 Second = 3.5 MB

1 Minute = 215 MB

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