Photography 101

To understand the use of photography in paranormal situations, you first have to grasp the history of photography in general. The first photograph was created by a device later named the camera obscura (Latin for veiled room), literally a room flooded by the faint light from the outside through a hole in one wall; that "image" was thus projected to the opposite wall (the image on the wall was upside down). This technique was then used to trace out the scene in detail by an artist and is first mentioned by Aristotle around 350 BC. He wrote on the subject of optics, mentioning the camera obscura and noting that the small the hole through which the light was admitted, the sharper the image.

About 1000 AD, the Arabs introduced the concept of optical lenses, thus making the camera obscura more interesting in that by using a lens with a moving aperture, you could project a scene lighter without losing sharpness. The Arabs also introduced the concept of times effect in such devices, therefore the birth of the concept of light traveling at a specific speed, in this case from the lens to the opposing wall.

The camera as we know it became more popular in the nineteenth century. The first recognizable photography that still survives, was taken in 1826 and required an eight hour exposure due to the light sensitive material used on the plate, which effectively replaced the opposing wall from the camera obscura model.

The new camera was comprised of a lens with a variable aperture to adjust the iris to control the light source, a photographic medium (film or paper plate for example). The length of the exposure was decided by two factors, the amount of available light to the object being photographed and the speed of the photosensitive material onto which the image is being projected. The basic rules of the camera obscura remained constant, the larger the aperture the less defined the image to the plate; the faster the photosensitive material on the plate, the small the aperture setting has to be. One other rule applied, the slower the time used to make an image, the more stability was needed to be sure the camera did not move. As better and faster films came to be, the smaller the camera, thus shrinking the room sized camera obscura down to a hand held variety.

After World War II, the wide use of film based 35 mm cameras became the standard for most photographers, but larger formats were still utilized when fine grain and greater detail was required. Photojournalism jumped from a 4x5 Speed Graphic to the 35mm Nikon "F" series in the 1950s when Nikon introduced a line of optics unheard of previously' the basic camera stayed the same, but interchangeable lenses made limitless imaging possible in the field, utilizing common lenses that ranged from the wide angle 24mm to the long distance 1200mm variety. A photographer at a baseball game no longer had to hug the first base line to capture a working image, he could now sit in the press box on the second tier and capture the same image in relative comfort, freeing up the choice seats for people who could pay top dollar to be there. Suddenly, but the 1960s "spot news" was the norm and street photography was considered an acceptable way of life in most big cities as press photographers roamed freely with one Nikon F slung across his chest with a long lens attached, a second was over the shoulder with a 24mm lens in place and a "gadget bag" hugged his hip with assorted filters and extension tubes to match any challenge.

Today, the 35mm "Style" Single lens reflex camera still reigns supreme, but instead of roll film the photographer is making his images onto a highly sensitive electronic medium called

the CCD or Charged Coupling Device which replaces the film. The first digital camera was offered less than 20 years ago by Sony, called the Mavica and later Kodak introduced the more sophisticated DCS100, which had limited use with print journalists. The majority of professional photographers say that they have not abandoned the film based camera; the digital age is here, and now digital cameras in cellular telephones are the norm.

So, how does this affect the use of photography in paranormal investigations? There are two distinct items that beg this question; time and reflectivity. Reflectivity is the basis of photography; the image is simply the capture of reflected light.

Let's take an example from every day investigating, the most common photo anomaly we see, the ORB. The true test of the orb as a photographic anomaly is its self luminescence, that is, its ability to emit light, rather than to reflect it. Most digital cameras have one or more flaws that do not normally crop up in day to day shooting but play havoc for the would be ghost hunter. They have automated exposure, automatic flash and some sort of either fixed focus or auto focusing mechanism. In the least expensive models there are also inherent lens problems, flaws or anomalous artifact when there is a plastic lens. For the purpose of this discussion, we will assume that the camera being used has a good quality glass lens and that it can be fitted with a removable filter.

When you take a flash photo, the flash fires in sync with the shutter. While the camera will attempt to focus on the object in the viewfinder, the point of focus is weighted; in other words in an expensive digital, there may be five or six focal points and the internal computer attempts to find the best focus to accommodate all of them; in a less expensive camera, you may be looking at three points of focus, or even just one, but in all cases, unless there is a large object on the periphery the camera normally attempts to focus on the center of what you are looking at.

If there is another object between that focal point and the camera, it is subject to the basic laws of physics and will reflect light based on its makeup and location in the frame. The closer the object, the more reflectivity -- the further away the less. Likewise, the more mass the object has, the more reflective surface. As an example, a recent string of photos shows a very bright orb in the first photo. In the second frame it is further away, less bright and traveling. The third is the least bright, the furthest away and still moving, presumably on a minute current of air. This is commonly the phenomenon found with dust.

Not all orbs however fit the pattern. We have another photo, taken in an apartment. The focal point is infinity; the lens is focusing at a distant wall. Half way between the camera and the focus point is a hanging beam and at that point there is an orb that is partially obscured from view by the beam. While the object may be reflective, it is much brighter than the surrounding objects, suggesting self luminescence. The orb in this photo is complex, when enlarged 40 times the norm, you can see a swirl of very intricate and interlaced "wires" that given the distance of the camera could never reflect the flash to that degree. This is a true paranormal occurrence.

Likewise, every photo that shows an anomaly must be scrutinized accordingly, looking to the logical answers first. As Arthur Conan Doyle states, "Once you have eliminated every other possibility, what is left is the true answer, no matter how unlikely." Assume that any photo you take that contains an anomaly will be scrutinized in this way. You will never hear an

ASUP spokesperson say that they have a ghost photograph; rather they will at best say they have a photo that seems to have a ghost in it. We never speak in absolutes.

When in doubt, the ASUP will share an image with a professional for re-evaluation, but as we have seen, these individuals are looking at the nuts and bolts of an image and as one recently shared, when showed a photo of a ghost on a staircase, the expert responded, "If there was someone standing on the stair it is not a ghost, but if there was no one standing on the stairs, it is a ghost!"

Better photos can be captured with better equipment. The addition of a simple UV (Ultraviolet) filter will cut down on reflections, lens flair and light anomalies for instance. Every camera should have a simple UV filter, they were commonly given to new camera owners when film was used, but new digital camera sellers tend not to want to give things away. The practice of giving away the filter in the first place was to correct heavy reflection and to protect the expensive lens on the older cameras but today's cameras are, for the most part, considered throw-aways to begin with. Therefore your choice of camera is important, more expensive is not necessarily better but cheap rarely works for these studies.

As previously mentioned both at the last meeting and in a training bulletin, the latest "old thing" being resurrected by the pros in our field is the use of IR photography. When we talk about what was entitled, "Spirit Photos" the use of Infrared is the name of the game. Distributed at the last meeting, I gave away a handout on the topic, which I have added here for those who did not get it.

In Consideration of IR Photography as It Relates to Hauntings

A good deal has been noted in the last year in reference to the use of IR and Full Spectrum photography in the investigation of haunting cases and several protocols have been set to standardize the use of such equipment. Whether you are using an antique Olympus 2020Z ($150 used), an Olympus IR-300 ($250) or the latest Fuji IS-PRO ($2,500 - $4,000) or S3 Pro UVIR ($1,200 to $3000), the rules seem to be stacking up the same, but there is room for the more esoteric considerations when groups like the ASUP are formulating their guidelines.

First, it should be recognized that while Infrared has been popular in our field of research since the very first photo investigations by the ASUP in the 1970s (using Kodak and Ilford films) it has been only recently that popular growth has been seen in paranormal investigations, thanks in part to the work of the group in Gettysburg (thus the term Gettysburg protocol) and more recently through the efforts of Barry Fitzgerald of GHI on TV. Particular credit is given to Fitzgerald because of the innovations he has introduced in this area; noteworthy the dual camera rig shown on TV - two matching cameras, one shooting normal digital images the second shooting full spectrum in tandem, utilizing a "servo" to guarantee that both are firing at precisely the same time at the same field of view. The result is a great comparison of what can be seen from each, the invisible suddenly becoming visible.

Of course the GHI-Fitzgerald tandem set-up is almost as expensive as the much sought after FLIR thermal imaging camera, but practically speaking, similar results can be produced with less expensive systems, like the old 2020Z Olympus. The dual camera system simply

eradicates the skeptics' nay-saying by offering in essence, what you see vs., what you don't see results, similar to the same types of cameras being used in both police forensics and lab based investigations made popular by TV shows like CSI. For those who wish to learn a little more about what we are actually capturing in that full spectrum-IR field, I have attached a brief explanation at the end of this piece.

The history of digital IR is simple. The very first digital still cameras had no IR filtering, but users complained that the color rendition was bad and the manufacturers soon adopted a universal filter that exists inside virtually every camera today. While some third-party technicians have introduced the idea of modifying any digital to take IR by opening and cutting out the offending filtration, the outcome is less than desirable in some cases, based on the technological variances from camera model to camera model. Likewise, once you remove the filtration that gives you the true color matching in a digital, you have to add a deep-red filter (R72) to once again capture the IR spectrum. You can at this point opt for other filters in front of the camera lens, to adjust to the spectrum you wish to photograph.

The other rule in IR is that what you are aiming for is not what you get. When shooting IR film in a good SLR, you would note a little mark on each of your lenses. Assuming you are shooting to infinity, this is where you would set your lens, NOT to focus through the camera, but a few mm down. That is because IR does not focus to infinity normally, you have to adjust the focus to match the characteristics of the film being used. In digital cameras, this is not true, there are no IR marks on the lens because the manufacturer of the camera did not see any reason to include them. Nevertheless, the only way you can get a really sharp IR image with an IR enabled camera is with a longer than normal exposure on a tripod or under extremely bright lighting, such as a sunny day.

While the technical side of this is fascinating, what is more interesting so far in all the years that I have been shooting IR is what I would like to think of as the "invitation" phase of such photography in the paranormal setting. After shooting IR for years, I have come to the observation that when the photographer subconsciously states his purpose and belief that such a photo is possible, should there be a willing "subject" the equipment is more likely to appear on the film or digitally, than just anyone snapping away. It is almost as if, when a serious researcher is out to get an image, he or she is more likely to succeed over the use of remote cameras that shoot at random without the "invitation" to the subject. Of course to the skeptic, this is rubbish, just as all the photos taken to date have explainable causes; for the purpose of this presentation, I will not allude to that faction further. If you believe, this is another possible extension of the camera; if you don't believe no amount of technical information is going to change your mind!

To look at results objectively, you must first begin with the protocols suggested earlier. What I call the "Gettysburg" protocol refers to some simple guidelines. First and foremost is the basic idea that a single photo will not stand well on its own, and that if you shoot multiple images of the same scene in succession, the results will give you much more to work on. This is a poor man's answer to the dual camera rig introduced by Fitzgerald. In Gettysburg, the protocol has yielded many good images that you can see on the Internet, where one frame is just the landscape, while the second shows the clear image of a "ghostly" figure.

As noted, all of this is random unless you do several things. First, it is advisable to have a

"recorder" or person standing next to you when you take each shot, who is also looking at the landscape to note the errant sightseer rambling into the photo, which would certainly look like a ghost under certain conditions in IR. Having a witness eliminates the soul searching associated with the aftermath, when you find that image in a frame you can't deny.

There are many "What ifs" associated with IR and full spectrum photo evaluation. "What if there was a person walking into the frame?" being the best example, but equally troublesome, "What if the light source shifts?" or "What if it is just an error of double exposure?"

The answers have to be considered in how you shoot. The witness at your side will hopefully be able to attest to the scene being "people" free, both the photographer and witness should be aware of changing light sources, flashes, etc. while the double exposure is not as easy with digital photography as one might think. Yes, there is always Photoshop and photos can be manipulated, which is why the old timers in the field trust no one but themselves to begin with.

Hopefully, the image you have caught is well documented and witnessed and the researcher's credentials can attest to his or her intent.

All of that being said, we come full circle to the issue I raised earlier; "The Invitation," and if it has a place in this form of research. There is something to be said for positive thinking, but timing is also to come into the equation. Given some widely accepted theories about the materialization of ghostly images, we might do well to add it to our protocol. Based on the "cold spot" theory, that cold and sometimes hot spots are documented in haunted places and that these are related to a spirit that is gathering energy to manifest itself (thus the use of thermal imaging equipment like the FLIR) we might assume that in order to capture an image of that spirit in IR or full spectrum, it must first have drawn enough energy from its surroundings to show itself successfully. In the investigation of cold spots, the issue is once again raised that to be successful, it is more likely when willing participants are present and asking the spirit to materialize. If that is true, then a similar invitation would work well for a photographer wishing to capture such an image.

I will now digress a moment to a recent investigation in Jefferson, Texas, where a dozen trained field investigators took over a reputedly haunted Bed & Breakfast for the weekend. The hostess gave the group full access to two buildings and the group worked for 12 hours overnight and again for several hours the next day, without any interruptions by guests who would normally be around the grounds and buildings.

In all literally thousands of photos were taken that weekend, as well as extensive recordings, K-2 sessions, which in and of themselves were sometimes startling, and Mini-Box experiments. Several investigators were also taking Full Spectrum –IR photography. At the end of the weekend, there were several "interesting" photos found, not the least of which was from a series of photos taken in IR, which included the main staircase of the Victorian mansion.

The hostess had noted earlier that she had witnessed a male figure on the stairs previously. When reviewing the images, and noting that it was captured following the "Gettysburg Protocol," there was one frame that had a remarkable ghostly image on the stairs. There were three images taken in succession using ambient lights, no flash, one after the other, and utilizing a tripod… the other two were also sharp images, but without any "ghost". The

photographer asked his witness to think about that series; could there have been someone walking down the stairs? No.

On follow up, the photographer asked that an officer poll the others in the house to confirm who, if anyone had also witnessed the photos being taken or if there was any chance that someone had come bouncing down the stairs during the series (the timeline is important here, with less than one second between frames, which would have been in and of itself remarkable, given the steep incline of the stairs). While this image is still under investigation and the ASUP has not officially commented on its nature to this point, there is definitely something there.

Noteworthy, is the timing in question. The series was taken "the morning after" investigators had working in the house for 12 hours, only breaking for a rest at 4 a.m. This obviously could be seen as an "excitement" for anything paranormal in the house and followed an extensive K-2 and Mini-Box session at the end of that first night that identified three individual spirits in residence. If the "ghost" needed energy, he certainly had ample supplies at hand. The next morning, people were just arising when the IR photo session was being accomplished. The attitude of those in attendance was extremely positive and upbeat, based on the previous day's activities, so there was, once again, ample energy for something to manifest within the confines of the old house and would suggest an invitation for contact… resulting in what appears to be a full body apparition as shown below.

Obviously, the image above looks similar to the famous "Gray Lady of Raynham Hall" which has been a benchmark of spirit photographer for over 100 years. It certainly is not unique to the files of paranormal investigations, but is rare if you were to count it among the millions of images taken annually around the globe. While this was not the only photo of interest to the researcher's this weekend, (there were several others) this is the quintessential image sought after by so many of their kind. The only comment made officially by the ASUP was, "It is the kind of thing we have come to expect in Jefferson, a city with a long history steeped in the lore of the restless spirit. We are pleased, but not surprised."

So what is IR photography

When shooting IR film, the biggest obstacle to getting a good print is exposure, which in and of itself is not as great a problem when shooting IR or Full Spectrum digitally. The biggest problem with digital IR images is associated with the cost of the equipment.

Infrared is not simply infrared. The width of the spectrum is extremely wide. It begins at 700 nm, the

extreme edge of the visible spectrum and from there it merges into heat waves. Infrared is broken down into four ranges. The actinic range is the nearest to visible light. These wavelengths are produced by incandescent objects such as the sun or a light bulb. This radiation can also be reflected by objects which are not themselves hot. Good *reflectors* of this type are green leaves and the human body.

The next range is called the *hot-object range*. This is the infrared radiation given off by hot irons or electrical appliances having a temperature of about 400C. Next is the *calorific range*. This non-actinic radiation is produced by objects having a temperature from about 100C to 200C. Finally there is the *warm range*, non-actinic radiation given off by the human body or the ground. The wavelength involved here is about 9000nm and *cannot be recorded* by film. (In other words, the heat given off by the body and the landscape cannot be photographed. There must be a source of IR light that can be *reflected*.)

IR film is sensitive to a range from 650 to 800 nm, although it peeks in its sensitivity to IR at about 750nm, only 50 nm above the visible spectrum. Kodak's film is capable of recording IR from 750 to 900+nm. As you can see, therefore, both films are only capable of recording IR in the first two ranges. Except for the sun or artificial lights, in most infrared photography, all objects will be *reflecting* IR not emitting it, an interesting footnote given the supposed nature of what we call ghosts. We are not talking about thermal imaging, such as the FLIR camera. Therefore like ordinary photography we are shooting subjects which reflect light from a source. And that source will be the sun or an artificial light such as tungsten lights or strobes.

Experimenting in IR or Full Spectrum is unique, it certainly has its place in the paranormal investigators bag of tricks, but like everyone else we study, there is a human connection that skeptics tend to negate. That is not to say a non-believer could not have taken this kind of image, they can and they often do; rather the image was taken at a point in time when the air was emotionally charged, making the process all that much more easy. We still have a lot to learn, but the future looks very promising indeed for this particular part of what we study.

In conclusion, I once again want to be sure we are all on the same page, so to speak. Photographically, whether we are shoot IR, Full Spectrum or normal digital images, the resulting image is coming from a source that either reflects or emits light or energy which is transferred through the lens and onto the CCD screen. The camera captures exactly what it sees within the limits of the spectrum you are shoot. If you shoot IR or full spectrum, you will probably opt for output in B&W because any color

you get is irrelevant, unless of course, you are shooting “art” and were trying to make green leafed trees in the summertime look like they are covered by ice and snow.

And, when shooting in either of these alternative formats, it is reasonable to use the person accompanying you as record to also be a sensitive, who is open to capturing the unusual. This added bonus seems to have the desired effect more often than when the photographer and recorder as more skeptical. You really do have to be open to all the possibilities, even when you are trying to capture the image of an unusual occurrence with a regular digital camera.

Some might argue that the resulting image is somehow a hallucination that the sensitive projects onto the camera, but I tend to disagree with the entire telepathic argument. Nevertheless it is our job to consider all the possibilities and our voyage into the world of photography is part of that quest. To be really good, you need to become an accomplished photographer, intimate with your gear and ready to shoot; some would say that is a lot of work for a little payback, I think it is just part of the landscape in which we toil.