Photography

Author: Cody Bolton, *Founder/Director - SGHA*
Article Credit: Southwest Ghost Hunters Association

There is more to photography than just capturing an image. There are entire disciplines of science dedicated to it. You can quickly step out of the realm of a photographer and enter into the sciences of optics and physics. Light itself is an electromagnetic phenomenon, its energy. So instead of thinking about cameras in terms of taking pictures, let's look at them as instruments designed to record energy. The film camera operates in a different manner then the digital camera. In film, the silver-halide crystals are sensitive to light. When a light source enters the camera through the lens, it strikes these crystals, which are in the emulsion layer of the film. Where light hits a crystal, the crystal changes structure and it clusters with other nearby silver-halide crystals that were also struck by light.

These clusters are still extremely tiny and form what is called a "latent" (invisible) image. To make this latent image appear, we "develop" the film by immersing the film in a chemical bath that converts the silver-halide clusters into black metallic silver clusters that form an image we can see. The process is different for a digital camera. We must form an image on a CCD chip. A CCD chip has a myriad of dots of silicon, called pixels that are recorded on its surface. Just like the silver-halide crystals, these pixels are light sensitive. When struck by light, they change. Nevertheless, unlike silver-halide crystals, they don't transform chemically. They transform electrically. When struck by light, each pixel produces a tiny electric charge. This charge is what enables us to "read" a picture digitally.

The front end of the digital camera is comparatively identical to the front end of a traditional film camera. Light enters the camera through a lens that focuses the image, and the focused light continues into the camera until it strikes the CCD chip. Here is where the digital camera is different from the film camera.

Each minuscule point of light strikes a silicon pixel, which immediately responds to that light by producing a tiny electrical charge. This electrical charge is "read" by the circuitry in the camera and converted into a number. The strengths of this charge ranges from 1 to 256 that we refer to as the shades of gray. Once the image is stored on the CCD chip, the CCD chip must transfer the digital image to either a memory chip or to a floppy disk so the CCD chip can recycle itself or clear its memory for the next image. The time between snapping the shutter and the time the digital camera is ready for the next photo is called the recycling time or the time it takes the CCD to transfer the digital image to another chip or disk and to erase the existing image, preparing the chip to receive a new image. The digital process and the chemical process differ not only in the media used to store the image, but also in the manner that it responds to the focused light entering the lens. The film camera must have a chemical process occur for the image to be preserved and the digital camera uses an electrical process to store the image on a CCD chip digitally.

The theory that many ghost hunters believe is that the camera is picking up light that the human eye cannot perceive. The accuracy of this depends on the type of camera that is being used. In 35mm cameras this theory is incorrect, as the majority of modern film is designed to react primarily to the visible portion of the electromagnetic spectrum, just like the human eye. There is some sensitivity to ultraviolet, but manufacturers try to minimize this by adding dyes to the emulsion and adding special coatings to the lens. What little UV light that might reach the film would have a bluish cast to it, not the ubiquitous whitish shapes found in most ghost photos. To photograph areas of invisible light, a 35mm camera must use a specialized film. These are typically infrared films like KODAK High Speed Infrared Film. It is a high-speed film with moderately high contrast, sensitive to light and radiant energy to 900 nanometers (nm) in wavelength. However, these films have to be handled carefully and require some training to use them correctly.

With digital cameras the theory is more plausible. The widespread use of digital cameras, and the popular discovery that the image sensor, called a CCD, is sensitive to both ultraviolet and infrared, has caused a resurgence of interest in photography with invisible radiation. All the CCDs used in consumer digital cameras are also sensitive to ultraviolet. This is why digital cameras are more prone to capturing "orbs" than 35mm film. A camera's flash is composed of mostly UV light and when dust or airborne particles float in front of then lens, the UV light from the flash bounces off of the particles and they are recorded by the CDD.

I think Bob already mentioned this but here is a very crude test of IR sensitivity for digital cameras:

· Point a TV, camera or other IR remote into the lens of your camera.
· Press any button on the remote.
· Look for the IR beam in the camera's LCD or EVF (electronic viewfinder).

If you can see the remote's beam, a bright white light coming from the end of the remote, your camera is capable of recording light down into the infrared portion of the spectrum.

Skeptics will claim that any sixth grader can use a photo-editing program, like Photoshop, to fake a digital image. If we go under these criteria, then any sixth grader who takes a basic photography class can fake a print by combining two or more negatives or by touching up the negative to create a false print. Negatives do not guarantee validity, as some skeptics would like to fool people into thinking. Trick Photography is very specific about how to create photo tricks just as digital manipulation can be done to create a trick photo. Digital cameras also have a negative of sorts; it is contained within the photo itself. Its called and EXIF file and this file will tell you what type of camera took the photo along with other relevant data on exposure and focus.

If an editing program manipulated a photograph, each and every step will be documented in the EXIF as well. However, it is quite simple to erase the EXIF file itself, simply changing the name of the photo will do so. Granted, most us change the file names as it is practical and makes things allot easier for the Webmaster. Generally, it's a good idea to

save the original disc with the EXIF files intact. You can download EXIF programs, just google it, but as with any kind of program, some are better than others. So you might want to browse around abit until you find one that you like.

35mm film is also more prone to creating errors. There are over 200 possible photographic flaws that can be created by film. Some, such as expired shelf life and exposure to heat, are two that you may not have any control of. How many people actually look at the expiration date on the box when they are buying film? The film may have also been exposed to high temperatures during shipping or storage. Both of these conditions can cause a fogging effect on the negative and thus in your photographs. In digital cameras there are fewer flaws and they usually result in a cascade failure, meaning that there isn't even a photo taken as all of the data is lost. So 35mm cameras are not a great instruments to use as they cannot "see" into the areas we want to look into and they have too many possibilities of creating photographic flaws that could be mistaken for ghostly phenomena. Here are a few of the possible photographic flaws that can be created by film. To be honest, the first 6 apply to both kinds of cameras so they don't count. However, since this is an article on photography, I included them.

1) Blurry Pictures
Blurry photos are usually the result of camera shake. The simplest way to remedy this problem is to buy and use a good, sturdy tripod. If you can't shoot with a tripod, remember to use a faster ISO on digital cameras or faster film on film cameras. This allows you to increase your shutter speed. The faster the shutter speed, the less likely you are to suffer from camera shake.

2) Contrasty Pictures
These come from high contrast lighting situations. Photographing in the forest on a sunny day is an example of a high contrast situation. Photographing at Noon on a bright, sunny day is an example of a high contrast situation. Film is more of a problem here because of its sensitivity to light.

3) Underexposed Pictures
Underexposure often results from letting the camera make all the exposure decisions. Remember, the camera's meter wants everything to be medium (or gray.) If you do use the auto exposure functions, one common mistake comes from using auto exposure compensation and then forgetting you've done so. Make sure that you get enough light into the scene before you press the shutter.

4) Overexposed Pictures (slides)
Like underexposure, overexposure can result from letting your camera make all the decisions. Overexposure means blown out highlights and that means lost information. Basing your exposure on shaded or dark areas and letting the camera set the exposure is a formula for overexposed slides. Look for something medium to meter from or, better yet, meter the highlights. Just make sure your highlights won't be more than two and one half (2 ½) stops lighter than medium.

5) Lens Flare
Flare occurs when direct light hits the front element of the lens and light starts bouncing around inside the lens. This causes the light to reflect off all the elements. This can reduce contrast and make your pictures look "hazy". Most commonly, it results in a series of round highlights across your image. Be sure to use a lens hood to help prevent this. Sometimes you'll need more than a lens hood. Try using your hand or a hat to shade the lens. If someone is with you, ask him or her to stand so that they cast a shadow on the lens. Although it can be a problem with digital cameras, it's more so for film because it's hard to detect lens flare when looking through the viewfinder; using your depth of field preview button will make this easier.

6) Color Casts
Color casts can result from using the wrong film, outdated or spoiled film or shooting in deep shade. Shooting in the shade on a sunny day will result is a bluish cast. After all, the predominant light source is the blue sky. Indoors, color casts can have an orange or reddish hue.

7) Bad developer
This one really sucks because you have no control over it. The possible results are limitless. Black streaks, blotches, poor maintenance of developing equipment, just to name a few, can all create artifacts. In essence this can also happen in a professional processing lab. There is also the possibility of bad fix, which can leave everything from large discolored orbs to simple discoloration within the image.

8) Dust on the negative
Caused by improper handling of the film either by the photographer or the lab, they appear as white specks on the print. Some dirt, once it gets on the negative, can be impossible to remove. How many folks actually clean out their camera on a regular basis? Many do not.

9.) Overlapped pictures
The camera not fully advancing the film causes overlapped pictures. Most are easy to spot but some can be quite tricky. The last picture on the roll overlaps onto the second to the last picture.

10) Exposure to heat
Can damage the emulsion and film itself, causing reddish "clouds" and other unusual blurs of color.

11) Exposure to freezing Temperatures for extended periods of time
This is different for each brand of film. Each has their own limitations. Film that has been frozen can be brittle; causing it to form hairline cracks that look "paranormal" when developed.

12) Expired Shelf Life
If old, it will mold, sometimes turning the film a pinkish hue.

13) Film not developed promptly
Once again, can cause color artifacts and fogging.

14) Exposure to X-rays and strong magnetic fields
Can cause the film to be ruined, have color artifacts or leave unusual white streaks.

15) Last Picture on the roll
The first and last pictures on a roll can sometimes have a reddish, orange or yellow artifact that is caused by faulty handling or loading the film in direct sunlight.

16) Camera malfunction
Film can be scratched during winding or unwinding leaving an "orb trail" effect on the prints. It can also be created by improper handling of the film.

17) Oil from your fingers
Usually this happens while your loading the film. If you touch the negative to far back, the oil from your fingers can transfer to another negative when the film is advanced.

18) Light Leaks
Typically caused by improper handling or damaged camera body. Its not that I'm all against 35mm cameras, but back in the 80's its all we had. Every now and then we would get a spectacular image only to have a more knowledgeable person say, "No, that is caused by this". Then they show you exactly how the "ghost" was created, by a completely explainable means.

So, its good to know what those flaws are, if nothing else so you can counter when a skeptic makes a claim that your photo is just a photographic error. A good course on photography and developing, along with a bit of experimentation, can be very enlightening. For information's sake, that number of "over 200" comes from CSICOP, who are experts at picking apart a photograph, especially when it contains a "ghost".

About the Author:
Cody Polston is the Founder and President of the Southwest Ghost Hunter's Association. Formerly an Explosive Ordnance Disposal technician, he has a varied scientific background related to that particular field. With over twenty years of ghost research, he initially started out as a skeptic before forming SGHA.