

# Surefire Techniques for Archaeological Photography in Dark Places

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## ABSTRACT

Experimenting with the mode settings included on most digital SLR cameras is an excellent way to learn photographic skills useful for recording images in low-light situations often associated with archaeological excavations. In most cases, the use of “sports mode” settings provides the optimal balance of high ISO and shutter speed needed to capture detailed excavation images. Variations of these settings will be used to illustrate how to minimize digital noise in archaeological photography.

## Introduction

During the SHA conference in Colonial Williamsburg in January 2007, the author spent an afternoon enjoying the sights and sounds at the glasshouse in the Colonial Jamestown settlement. While photographing some of the glass produced that day, several people stopped to ask how to take better photographs in the dark environment of the workshop. These encounters encouraged the evaluation of the camera settings being used, and it was realized that the soft, somewhat hazy light in the glasshouse was similar to the difficult lighting situations experienced when shooting large indoor sporting events. Realizing the similarity of the challenges, the decision was made to set the camera settings to sports mode, a mode seldom used by professional photographers; this single decision made all the difference in the quality of photographs recorded that day, and a world of new photographic options became evident.

## Suggested Technique for Low-Light Photography

One of the least successful ways to use a digital SLR camera in less-than-perfect archaeological site environments is in automatic mode. Images will be obtained, but there is little or no control over their integrity. More than once, archaeologists have photographed important sites with automatic settings, only to come away with poor-quality images that

inadequately illustrate key aspects of their work. The camera does not care about the content being photographed. It is only a tool that records images according to settings determined by the user. Selecting the sports mode setting on the camera may not seem like an obvious choice when photographing artifacts, but artifacts are often located in environments with variable light conditions; sports mode is designed for shooting in just such situations.

A quick introduction to some photographic terms will be useful before any explanation of the beneficial uses of sports mode for archaeological site photography in variable-light situations. Regardless of whether the camera being used is a film or digital camera, ISO or International Organization for Standardization is one of the main ways to control and manipulate light. Adjusting ISO is how photographers control relative sensitivity of film. The same is true with digital cameras, except that in the digital world film is replaced by a sensor. Higher ISO numbers mean greater light sensitivity. A setting of ISO 100 to ISO 200 is generally best for bright daylight photography. In a darker environment such as a cave site or excavations in a heavily wooded area, a higher ISO of 500 or even 1000 may be required to ensure that sufficient light is in contact with the sensor. At indoor sporting events, it is generally necessary to shoot at ISO 1600 or higher to capture detail and account for the variability of indoor light.

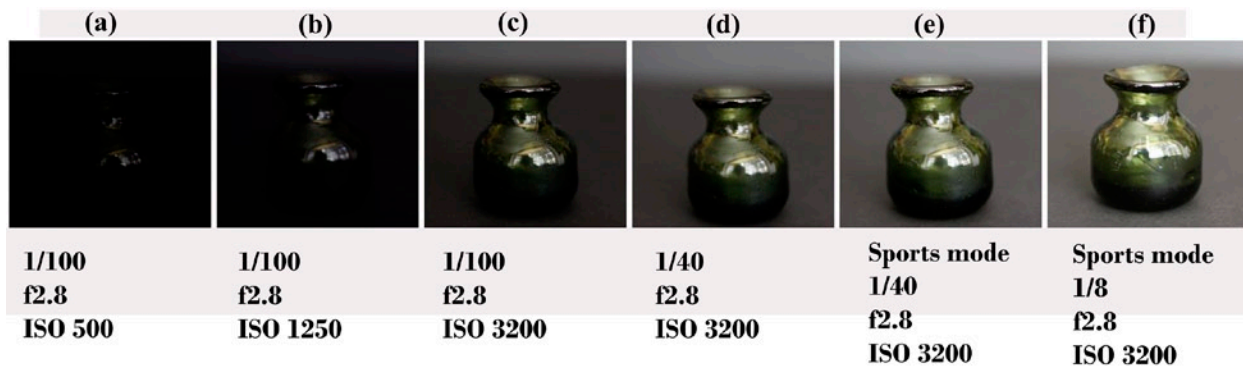
It is important to note that as the ISO setting on the camera increases, the amount of digital noise inherent in the captured images also increases. Digital noise is roughly equivalent to film grain. Generally, it is desirable to use the lowest ISO setting possible to minimize digital noise or graininess in images. At dimly lit sporting events the use of higher ISO settings is required to capture sufficient light and fast-moving action scenarios. For archaeologists, sports mode shooting ensures capturing sufficient light while enabling the photographer to shoot at a shutter speed fast enough to eliminate the need for a tripod.

Both the automatic mode setting and the Aperture-Priority (sometimes listed as AV or AE) settings on the majority of digital SLR cameras are designed for radically varying light conditions. For instance, in the Aperture-Priority mode the user sets the desired aperture and the camera automatically selects the shutter speed. In the highly variable circumstances of archaeological sites, one photograph captured with a short exposure time may be crystal clear while several other shots are out of focus because the camera moved slightly during the long exposure times set by the camera. People often comment that their cameras seem unpredictable because shutter speed for one shot seems fast while in another circumstance the shutter speed is slower. Shooting in Aperture-Priority mode is generally more successful when working with a tripod, since the camera is less likely to move while the shutter is open.

For occasional photographers and for archaeologists working in less-than-perfect environments, selecting the sports mode settings on even an inexpensive digital camera will yield surprisingly good results. Often, as was the case at the Jamestown glassworks, visitors do not bring a variety of lenses, tripods, and supplemental lighting for their photography. Even if this equipment is brought along, some archaeological sites, museums, and museum workshops will only allow photography without the use of supplemental lighting, and in general the use of tripods and reflector screens is never permitted. As a common courtesy, one should always check with venue management before taking any photographs.

After ascertaining that photography is permitted, the challenge becomes one of capturing sufficient light to create successful images while shooting handheld in a low-light environment. Most photographers require a shutter speed of at least 1/100 of a second to eliminate motion blurring in their images. In low-light situations, a well-practiced photographer will adjust to a higher ISO setting, remembering all the while that at higher settings, image quality suffers. Figure 1 is a series of images of a glass bottle. Notice that in image (a), shot at 1/100 sec./f2.8 and ISO 500, the image is dark. Image (b) taken at 1/100 sec./f2.8 and ISO 1250 is slightly brighter. By comparison, the diagnostic attributes of the bottle are much clearer in image (c), although surface texture and coloration are still questionable. Image (d), taken at ISO 3200, has better surface detail and clarity. Images (e) and (f) were taken in sports mode. Both are slightly brighter and more detailed.

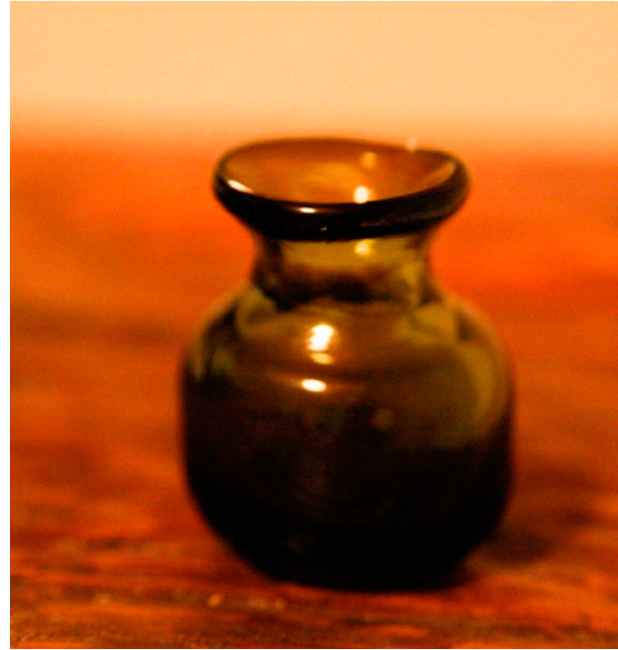
Figure 2 is a photograph in its unedited state. This image was taken in a low-light environment at 1/50 of a second, f2.8 aperture, and ISO 800. Although no color correction has been attempted, the image of the glass bottle is clean and focused. By comparison, Figure 3 is an image of the same artifact photographed at 1/50 of a second, f2.8 aperture, and ISO 1600. Notice that as the ISO setting for this image is increased, digital noise is apparent and the general clarity of the artifact image is compromised. In this case, the ISO setting of 800 proved to be the best setting to maintain clarity of the image while maintaining a low-noise factor. Using the through-the-lens light meter feature of



**Figure 1.** Comparison of ISO and sports mode images. Image (a), shot at 1/100 sec./f2.8 and ISO 500 is dark; (b) is also dark. In (c), diagnostic attributes of the bottle are clearer; (d), an image taken at ISO 3200, has better surface detail and clarity. Images (e) and (f) were taken in sports mode. Both are slightly brighter and more detailed. (Photographs by author, 2007.)



**Figure 2.** Taken in a low light environment at 1/50 sec./f2.8 aperture, and ISO 800, this image of the glass bottle is clean and focused. (Photograph by author, 2007.)



**Figure 3.** Shot at an ISO setting of 1600, the surface texture and clarity of the artifact are compromised. (Photograph by author, 2007.)

the camera, this setting was used in sports mode to obtain the best-quality image possible in this low-light setting.

With practice it is possible to develop a shooting strategy that allows quick adaptations to changes in light and other variables that affect the quality of images. The beauty of digital images is that after taking an image the camera screen provides immediate feedback on the camera's preview screen. This can be a deceptive for gauging the quality of a shot, however, because on such a small screen it is impossible to determine graininess, quality of exposure, and accuracy of colors. A better way to determine the success of a given photograph is to use the histogram feature of the camera. With practice, reading a histogram becomes a much better measure of photograph quality and successful recording.

### Conclusion

The nearly instantaneous recording ability of digital cameras has improved archaeological documentation efforts in the field. The price of digital cameras and the speed with which the usability of the images is verified

has made film cameras all but obsolete for most archaeological photography. In fact, low pricing of SLR digital cameras has made them a mainstay of archaeological excavation sites. Gone are the days when an unsuspecting graduate student would be handed a film camera and assigned the task of documenting site activities, only to find out when the film was developed that few usable images were recorded. All archaeologists should develop some nominal photography skills. Digital cameras have taken some of the guesswork out of controlling light and capturing images. A small amount of experimentation will lead to better images to supplement fieldwork experiences. Experimenting with the sports mode settings of the digital SLR camera is an excellent way to augment photographic skills in variable or low-light archaeological environments.

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