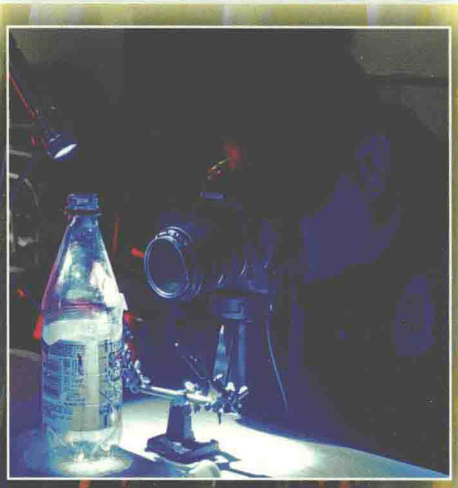
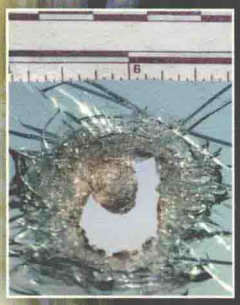
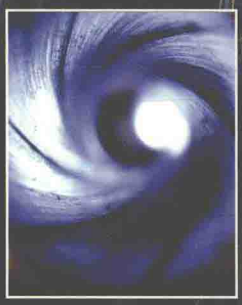


Advanced CRIME SCENE PHOTOGRAPHY





Second Edition

Christopher D. Duncan

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Advanced
CRIME SCENE PHOTOGRAPHY

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Crime Scene Investigator
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Preface

Advanced Crime Scene Photography developed from my personal challenges and experiences as a crime scene investigator in a large metropolitan police department. Like in any major city, violent crime is quite prevalent and has offered numerous opportunities to learn, create, and develop tools and skills needed to properly document a crime scene. Working an active crime scene is so much different than working in the pristine world of a photography studio. Evidence is commonly found in some of the most difficult to access and photograph locations. Possessing the knowledge and skills necessary to photograph evidence in less-than-accommodating environments is certainly advantageous. The ability to thoroughly and accurately photograph a crime scene is a mandate for all investigators, regardless of the time of day, weather conditions, and/or confines within which a piece of evidence is concealed.

Crime scene photographers are not tasked with proving a person's guilt or innocence. They are not responsible for *proving* the prosecutor's case. Crime scene photographers and crime scene investigators are required to find and testify about the truth found at the crime scene and about the evidence. Testifying is another skill that does not just happen. It develops over time and through experiences: some good and some bad. When the time to testify comes, some of the first pieces of evidence shown to a jury will be the crime scene photographs. If those photographs are out of focus, poorly exposed, or fail to show the evidence, then the whole body of work by an investigator may be questioned by the jury. Investigators will certainly benefit from putting their best foot forward by showing the jury a photographer's skill and dedication to his craft. Consequently, from start to finish, the value of quality crime scene photographs cannot be emphasized enough, and this text is written to help photographers achieve the goal of capturing the best possible image in all kinds of environments and conditions.

Anyone with a camera phone can take a photograph in perfect lighting, with the subject sitting out in the open and already positioned for the best composition. The goal of this text is to help give crime scene photographers the skills to record those same beautiful photographs in adverse condition, surrounded by tragedy, and with the tools available to the investigator. The greatest tool a photographer has is their brain. Cameras cannot be relied upon to calculate exposures in every situation. Furthermore, cameras are not able to compose an image within the viewfinder. As a result, photographers must take control of their photographic endeavors, identify the challenges, design a plan to capture the image correctly, and execute that plan.

Another goal of this text is to help readers solve those difficult photographic challenges and impress upon them the importance of recording accurate and quality photographs. Readers should have a base knowledge of basic photographic concepts, such as exposure and depth of field. *Advanced Crime Scene Photography* hopes to build upon a photographer's basic skill set and move them to a level where nothing is impossible. If one can

see a subject, then one can photograph it. In addition, even if an investigator cannot see a piece of trace evidence, one may still be able to photograph it.

The first edition of *Advanced Crime Scene Photography* has been quite well received and, specifically, has been popular with college forensic programs. One of the major additions to the second edition is the inclusion of review questions and photography assignments at the end of each chapter. This text is meant to provide guidance and ideas on how to record those difficult-to-capture images, and all photographers should practice their craft, whether they are actively working cases or are just beginning their careers. Providing guidance to the next generation of crime scene photographers is certainly a true honor.

A second significant change to the text is the addition of a chapter on fire investigations and photographing fire scenes, which was a direct request from the Harris County Fire Marshal's Office and the Houston Fire Department's Arson Division. Presented in this chapter, like in many areas of the book, are the common challenges faced by fire investigators and a variety of solutions to solve those challenges. As with any crime scene photographic endeavor, the recording of quality photographs at the scene of a fire is extremely important.

To conclude, I hope that *Advanced Crime Scene Photography* provides students, photographers, and investigators with the knowledge and skills necessary to record meaningful photographic images. Quality crime scene photographs do not just happen. They must be planned by a detail-minded photographer. Taking the time to plan and execute a photographic task is extremely important. *Point and shoot* is not an effective philosophy for crime scene photographers. Investigators should be telling the camera how to record an image, not the other way around. I am confident that readers will find *Advanced Crime Scene Photography* helpful in achieving their photographic goals.

Acknowledgments

Maturing into a confident and valuable crime scene investigator and/or photographer occurs over time and through training, education, and experience. The process of improving one's skills is made much easier with the help of investigators who preceded the novice. Lieutenant Alton "Glen" Riddle preceded me and has been my inspiration by setting the bar so high. I could not have had a better role model. Today that bar is set by my peers. Two of the finest investigators I know are Christine Ramirez and Celestina Rossi, crime scene investigators with the Montgomery County (TX) Sheriff's Office. Christine has also provided me countless opportunities to teach all around Texas through our positions with Texas A&M University. Not only do investigators need a role model, they need support as well. My support comes from my current lieutenant, Ronald Walker. Lieutenant Walker supports all the investigators assigned to our unit by encouraging their continued growth and knowledge in the field of crime scene investigations.

A single investigator cannot do it all. It takes a team to be successful and the team I work with at the Houston Police Department is truly outstanding. My first on-the-job trainer was Jay Hammerle. Jay is about to finish up his 28-year career this summer and we all wish him the best in his retirement. I could not have completed this book nor do my full-time job without the assistance of my coworkers: Andrew Taravella, Ernest Aguilera, Daniel Nunez, Alton Holmes, and Mike Perez. I am truly blessed to work with some of the sharpest and knowledgeable crime scene investigators anywhere around.

I have been a member of the International Association for Identification (IAI) since 2001 and I have been blessed with the opportunity to serve the association in a number of capacities. A superior photographer in his own right, past IAI president Phil Sanfillipo, has always supported my efforts, and I appreciate the confidence he has in me. Longtime IAI member Laura Tierney also has been a huge supporter for my work. In fact, she was the first one to encourage me to offer a presentation at one of our yearly educational conferences. It was those teaching experiences that initially led to being asked to write the first edition of *Advanced Crime Scene Photography.* Therefore, I owe Laura a great deal of appreciation and gratitude. Another recently retired friend and colleague, Curtis Klingle, was a big help in the writing of this text. Curtis and I have exchanged a number of techniques and photographic solutions over the years, as well as having worked together on forensic-related writings.

Taking on the challenge of completing the second edition of this work was monumental and much more than I expected. Finishing all the rewriting and editing of the text could not have been completed without the support of my loving wife, Rhonda. She worked just as hard, if not harder, taking care of the home and our two wonderful children, Wynn and Miranda. The second edition was certainly a team effort, all the way around. And that team would not be complete without the folks at CRC Press. I must thank Taylor & Francis Group for having the confidence in my work to ask for a second edition. Of course, none of

this writing would ever have come to light without Becky McEldowney Masterman, senior acquisitions editor, and David Fausel, project coordinator.

My ultimate goal is to encourage investigators to make the extra effort necessary to capture truly outstanding crime scene photographs and to avoid permitting arbitrary computer chips or checklists to determine what, which, and how photographs are recorded. I hope this book starts the creative juices flowing in all of us and that investigators seek out new techniques to record difficult evidentiary subjects. *Advanced Crime Scene Photography* should not be taken as a singular guide for crime scene photography, but as an invitation to crime scene photographers and investigators to take a more active role in their current photographic work. I hope that the readers will find this book informative and encouraging. I further hope that every investigator continues to seek the truth in all that he or she does.

Author

Christopher (Chris) D. Duncan is a senior police officer with the Houston Police Department and has been assigned to the Identification Division, Crime Scene Unit, since 1997. Prior to transferring to the Identification Division, he was assigned to patrol duties, including spending two years as a Gang Task Force Officer. He began his career with the Alexandria Sheriff's Department just after graduating from George Mason University with a BA in history. In 2007, he earned his MA in criminology from the University of Houston–Clear Lake. In regards to crime scene investigation, he has over 2100 hours of training specific to the documentation, collection, and processing of physical evidence. As part of his professional education, he attended and graduated from the National Forensic Academy (Knoxville, Tennessee) in 2003.

Chris is a member of the International Association for Identification (IAI), which is the premier organization of crime scene investigation specialists. He is board-certified by the IAI as a Senior Crime Scene Analyst, a Bloodstain Pattern Analyst, and a Forensic Photographer. He is currently a member of the IAI's Editorial Review Committee for the *Journal of Forensic Identification* and serves on the Science and Practices Committee for Bloodstain Pattern Analysis. Chris previously served the IAI as a member of the board of directors and the Science and Practices Committee for Forensic Photography. He is recognized as a *distinguished member* of the IAI and has won the yearly Forensic Photography contest five times. He is also a member of the Chesapeake Bay Division and the Texas Division of the IAI. Chris is a member of the International Association of Bloodstain Pattern Analysts (IABPA). He has written a number of articles, mostly on photography, for the IAI, IABPA, and several of the state IAI organizations. He has also taught at numerous educational conferences hosted by these organizations, at numerous police and sheriff academies, and currently instructs for the Texas Engineering Extension Service, a member of the Texas A&M University System.

Contents

Introduction 1

The complete and accurate photographic documentation of crime scenes is the cornerstone of any criminal investigation. The faithful portrayal of a crime scene demands that investigators and photographers thoughtfully and purposefully record true and accurate depictions of the location and evidence. Photographs provide a link between evidence recovered at a crime scene and the identification of a defendant in a court of law. The systematic and complete photographic recording of all aspects of an investigation helps bridge the gap between an individual piece of evidence and the processing of that evidence, which can lead to the identification of a suspect. Consequently, crime scene photography is an important and required task that must be accomplished with dedication and skill.

All too often, investigators feel they must operate in a robotic or automated mindset, which requires them to record a specific set of images, all with the camera set to the *Program* mode and recorded as if to checkmark some hypothetical box on some crime scene to-do list. Investigators who operate in such an automated mode, with rigid parameters, miss the opportunity to inspire and excite the photographic images' viewers. Not only should investigators document a scene as true and accurately as possible, they should also strive to create a lasting impression with the viewers, especially those viewers charged with deciding between guilt and innocence in a jury's deliberation room. Creating powerful evidentiary images that make a statement and have the greatest impact on the viewers should be a goal of all crime scene photographers. Documenting a crime scene is so much more than fulfilling the requirements found on some arbitrary checklist. It is an opportunity to show one's dedication and professionalism to the jury, prosecutors, and other investigators. Creating a lasting impression with a jury will go a long way during their deliberations. Typically, the first pieces of evidence seen by a jury are the crime scene photographs recorded by the investigator. If those photographs are poorly exposed, out of focus, or poorly composed, then the rest of the investigator's testimony may be questioned by a jury. On the other hand, by starting off one's testimony with professional looking, quality photographs, one's body of work will only serve to support the investigator's testimony and credibility on the witness stand.

Frequently, the fear of venturing too far away from a camera's *Program* or automatic mode settings comes from a lack of confidence. Investigators are afraid of making mistakes in exposure or composition and therefore rely too heavily on the camera to make all the decisions. The mistake actually being made is relying upon the camera to do all the work. One can possess the latest and greatest camera, having all the bells and whistles imaginable, but if the command dial is never moved off the automatic mode, one may as well be documenting the scene with a disposable point-and-shoot camera. The photographer, not the camera, is responsible for taking the picture. Cameras can be easily fooled into capturing under- and overexposed images. A photographer must learn to recognize what the camera is looking at and know how to compensate for difficult compositions, something even the best of photographic equipment cannot do. In addition, composing and orienting

a subject with the camera are just as important to obtain a proper exposure evaluation, and cameras are not able to make compositional decisions.

Advanced Crime Scene Photography is designed for those crime scene investigators and photographers comfortable with the operation of their cameras and who have a basic understanding of apertures, shutter speeds, ISO values (film speed), *stops* of light, and basic exposure calculations. Countless books and general photography classes cover basic photography concepts. Applying those fundamental concepts to the thorough documentation of a crime scene is the next step in a photographer's maturation and is one goal of this text.

Basic light evaluation and camera operation is all based on combining an ISO value, an aperture, and a shutter speed. Because everything in photography is about give and take, photographers must decide which exposure variable is most important for each composition and which exposure value can be sacrificed. The ISO value sets the camera's sensitivity to light, and lower ISO values offer the best color and image sharpness (Figure 1.1). The choice of aperture is primarily about depth of field. Larger apertures limit the image's zone of sharp focus, while smaller apertures extend the depth of field (Figure 1.2). The final variable is shutter speed and shutter speed control motion. The motion can come from subject movement, as well as the photographer's movement. Crime scene photographers should be comfortable with long exposures, just as much as they are with quick exposures (Figure 1.3). Quality photography begins with taking control of the process, which will most likely require the camera to be moved off of the *Program* mode. By moving to the *Manual* mode or one of the *Priority* modes, the photographer can choose the exposure value or values most important to them and record better overall compositions. This concept of selecting exposure variables for a specific purpose will be a key theme throughout this text.

The photographic skills of an investigator will naturally improve with time. Common failures among investigators include developing tunnel vision and failing to record a sufficient number of photographs in order to connect individual pieces of evidence with the overall crime scene. Subjects need to be oriented within the entire crime scene, shown in relationship to other pieces of evidence, and be properly photographed in close-up detail. Simply recording one or two images prior to an item's recovery is not conducive

Figure 1.1 Lower ISO values provide the sharpest images, with the best color. The ISO value of 100 is often recommended for any evidentiary photograph that is used for comparison and analysis. This composition was recorded at ISO 100, f/8, for 30 s.

Figure 1.2 Apertures primarily affect a composition's depth of field. The zone of sharp focus extends throughout this entire composition and was achieved with an aperture value of f/22 (ISO 100, 4 s).

(a)

(b)

Figure 1.3 Shutter speeds can be just a fraction of a second to several minutes long; (a) was recorded at 1/2500th of a second and was able to stop the explosive action of a bomb. (Photographed by Ernest Aguilera, Crime Scene Investigator, Houston Police Department, Houston, TX); (b) was recorded over the course of 45 min and recorded the movement of stars across the nighttime sky.

to achieving a full understanding of the evidence and its meaning within the context of the crime scene. Taking a thoughtful approach and actively participating in the crime scene photographic process will result in more stunning photographs and more valuable evidentiary images. When in doubt about a composition's success, always record another photograph. The cost of film (or digital image storage space) never outweighs the value of completeness.

Review of Basic Photographic Concepts

A fundamental understanding of basic photographic concepts is necessary in order to appreciate the ideas presented in this text. Therefore, a review of the general concepts of light evaluation and exposure principles is appropriate to ensure that everyone is speaking the same language. Capturing photographic images is all about the recording of light onto film or a digital imaging chip. A photographer can set his or her camera up in a completely dark room, open the shutter for hours, and not capture a single piece of information. However, a photograph can be taken during the daytime in a 1000th of a second under the right circumstances. Finding the correct exposure between a fraction of a second and an extended time exposure is based upon the amount of light illuminating a subject and the camera settings (ISO value, aperture, and shutter speed) chosen by the photographer. At times, the range of camera settings may be limited by the equipment, but the fundamental concepts remain the same regardless of whether one is using an older, fully manual film camera or the latest and greatest digital single-lens reflex (SLR) camera.

The photographic principles and concepts an investigator might have learned in order to use his or her film camera are just as applicable in today's world of digital imaging. Although film photography is not dead, digital cameras have become the primary recording media for law enforcement and the world as a whole. Film will still have its place in the art world and for photography purists, but the benefits offered by digital imaging to the law enforcement community from capture and processing to the dissemination of images are too great to ignore. Digital imaging will continue to improve with time, and the cost of digital equipment will become more and more affordable. In addition, digital imaging continues to provide tremendous advantages to the science of photography as the capabilities of digital photography continue to expand. The benefits of immediate gratification, simplicity of distribution, and the ease of image processing make digital photography especially favorable for crime scene investigators. However, whether an agency or individual photographer is using film or digital capture, the concepts of light, exposure, and composition are largely the same.

To begin, all cameras evaluate light, and light is broken down into *stops* or fractions of a stop. A full stop of light is equal to one-half or twice as much light as the next full stop. Therefore, if one increases an exposure by one stop, then effectively twice as much light is added to that particular composition. If one decreases an exposure by one stop, then one-half the amount of light is subtracted from the composition. The idea or concept of a stop allows one to compare apples to oranges. In regards to the camera, the apples and oranges refer to the camera's settings for ISO values, apertures, and shutter speeds (the exposure triangle). By breaking light down into stops, the photographer is able to compare equal amounts or values of light among ISO values, apertures, and shutter speeds. Eventually,

these values can be adjusted in order to fine-tune an exposure by making reciprocal changes in an exposure's calculation. As an example of reciprocity, if an accurate exposure can be made with the camera set to ISO 100 (sensitivity of media to light), f/8 (aperture or lens size), for 1/250 of a second (shutter speed) and one desires to increase the depth of field by decreasing the aperture's size to f/16, then a reciprocal change(s) in the other values must be made to balance the two-stop loss of light (f/8 to f/11 to f/16). Possible adjustments in the exposure could include the following:

- ISO 100 (constant), f/16 (–2 stops), at 1/60th of a second (+2 stops)
- ISO 400 (+2 stops), f/16 (–2 stops), at 1/250th of a second (constant)
- ISO 200 (+1 stop), f/16 (–2 stops), at 1/125th of a second (+1 stop)

The basic principle of light and stops of light should already be understood by the reader before progressing any further into this text. A multitude of books explain light evaluation, but anyone with a camera should already own such an explanatory text—it is the camera's instruction or owner's manual. The instruction manual does offer most readers a basic understanding of how one's camera evaluates an exposure and how their particular camera model breaks down light into stops. Commonly, cameras are able to break down light evaluations into half-stops or third-stops. As a refresher, full stops of light are typically identified as follows, although this list is far from all inclusive:

- ISO values
  - 100, 200, 400, 800, 1600, 3200, 6400
- Apertures
  - f/1.4, f/2.0, f/2.8, f/4.0, f/5.6, f/8.0, f/11, f/16, f/22, f/32
- Shutter speeds
  - 1/1000, 1/500, 1/250, 1/125, 1/60, 1/30, 1/15, 1/8, ¼, ½, 1 s

The ISO value is determined by the choice of film inserted into the camera or by the digital camera's particular ISO range. The choice of an ISO value will set the camera's sensitivity to light and will be the base from which the aperture and shutter speed choices will combine to create an exposure. The range in aperture choices is determined by the particular lens attached to the camera. Therefore, not every photographer will have the same flexibility in exposure adjustments because of the variety of lenses and their capabilities. If one is using a point-and-shoot style of camera, then the aperture range is likely to possess a very narrow gamut of available apertures. The range of available shutter speeds typically offers the greatest flexibility or greatest range of available values and will be determined by the camera's capabilities. SLR cameras typically have a range of shutter speeds from 30 s to 1/4000th of a second. Point-and-shoot cameras may or may not have as much versatility. Crime scene photographers are much more likely to employ slower shutter speeds, especially when working in low-light conditions. Therefore, the faster shutter speed values are not used as frequently. Crime scene investigators should also possess a camera capable of B (bulb) or T (time) exposures. This feature allows the camera's operator to keep the lens open for as long as the photographer desires. Understanding exposure evaluations and how one's camera meters light must be possessed by the photographer in order to get the most out of *Advanced Crime Scene Photography*.