

Suggested Readings

Ang, Tom

2012 **Digital Photographer's Handbook**. 5th ed. ISBN: 978-0756692421. DK Adult Publishing, New York.

Athearn, Frederic J.

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1972 **Illustrated Dictionary of Photography**. Fountain Press, Watford, England.

Banta, Melissa, and Curtis M. Hinsley

1986 **From Site to Sight: Anthropology, Photography and the Powers of Imagery**. Harvard University Press, Cambridge, Massachusetts.

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2009 Photography and Illustration. In: **The Archaeologist's Field Handbook: North American Edition**, pp. 289–341. AltaMira Press, Lanham, Maryland.

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1987 Metallic Powder as an Aid to Stone Tool Photography. **American Antiquity** 52(4):768–772.

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1998 **Kodak Professional Photoguide**. 6th ed. Sterling Publishing Co., New York.

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2010 **Crossroads of Culture: Anthropology Collections at the Denver Museum of Nature & Science**. University Press of Colorado, Boulder.

Comer, Douglas C., and Michael J. Harrower

2013 **Mapping Archaeological Landscapes from Space**. Springer Briefs in Archaeology, Archaeological Heritage Management. Springer, New York.

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2007 **Mastering Digital Black and White: A Photographer's Guide to High Quality Black-and-White Imaging and Printing (Digital Process and Print)**. ISBN: 978-1598633757. Thomson Course Technology PTR, Boston, Massachusetts.
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1985 **Conservation of Photographs**. Kodak Publication No. F-40, Eastman Kodak Co., Rochester, New York.
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1991 **Joy of Photography**. 3rd ed. Addison-Wesley, Reading, Massachusetts.
- Foster, Giraud V., and Norman J. Barker
1996 Close-up Photography of Archaeological Objects. **Journal of Field Archaeology** 23(3):369-375.
- Fredlund, Glen, and Linea Sundstrom
2007 Digital Infra-red Photography for Recording Painted Rock Art. **Antiquity** 81(313):733-742.

Gerster, Georg

- 2005 **The Past From Above: Aerial Photographs of Archaeological Sites.** Edited by Charlotte Trümpler. J. Paul Getty Museum, Los Angeles, California.

Gold, Dan

- 1981 **How To Use Your 35mm Camera.** Alfred Publishing Co., Van Nuys, California.

Harp, Elmer, Jr. (editor)

- 1975 **Photography in Archaeological Research.** School of American Research Books. University of New Mexico Press, Albuquerque.

Hauser, Kitty

- 2007 **Shadow Sites: Photography, Archaeology, and the British Landscape 1927–1951.** Oxford Historical Monographs. Oxford University Press, Oxford, UK.

Hedgecoe, John, and Ron Van Der Meer

- 1986 **The Working Camera: The World's First Three-Dimensional Guide to Photography Made Easy.** Harmony Books, New York.

Howard, William G., Douglas J. Hamilton, and Kathleen L. Howard

- 2006 **Photographing Mesa Verde: Nordenskiöld & Now.** Mesa Verde Centennial Series. Durango Herald Small Press, Durango, Colorado.

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- 1995 **A Practical Guide to Archaeological Photography.** 2nd ed. UCLA Institute of Archaeology, Archaeological Research Tools, Volume 6. Los Angeles, California.

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- 2004 **Mastering Digital Printing.** 2nd ed. ISBN: 1592004318. Thomson Course Technology PTR, Boston, Massachusetts.

Keegan, M. K., and Frontier Photographers

1990 **Enduring Culture: A Century of Photography of the Southwest Indians.** Clear Light Books, Santa Fe, New Mexico.

Kelby, Scott

2013 **The Digital Photography Book, Part 1.** 2nd ed. ISBN: 978-0321934949. Peachpit Press, Berkeley, California. [This is the first in a series covering a wide range of photography topics; Kelby published four other volumes/parts in 2008, 2009, 2012, and 2014]

Leiter, Eldon, Jerry Jacka, David S. Whitley, and Steven Wall

2001 Photographing Archaeological Sites. **American Archaeology** 5(1):21–28.

Lezano, Daniel

2012 **The Photography Bible: A Complete Guide for the 21st Century Photographer.** 3rd ed. David & Charles, Newton Abbot, UK.

Long, Ben

2014 **Complete Digital Photography.** 8th ed. with companion web site at www.completedigitalphotography.com. ISBN: 978-1305258723. Cengage Learning PTR, Course Technology, Boston, Massachusetts.

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1968 **Photography in Archaeology and Art.** John Baker, London, England.

McBrinn, Maxine E. (editor)

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1989 **Photography of Mineralogical, Paleontological and Archaeological Specimens.** Denver Museum of Natural History, Denver, Colorado.
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2004 **Colorado: A History in Photographs.** Revised ed. University Press of Colorado, Boulder.
- Szegedy-Maszak, Andrew
1989 Picturing the Past. **Archaeology** 42(4):38–47.
- Weide, David L., and Gary D. Webster
1967 Ammonium Chloride Powder Used in Photography of Artifacts. **American Antiquity** 32(1):104–105.

Wilhelm, Henry

2013 **The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures.** PDF/A edition. Originally published in 1993, Preservation Publishing Co., Grinnell, Iowa. [All or individual chapters of this book can be downloaded for free at www.wilhelm-research.com]

Wilson, D. R.

2000 **Air Photo Interpretation for Archaeologists.** 2nd ed. Tempus Publishing, Ltd., Stroud, Gloucestershire, England.

Internet Resources

Archival products & storage: www.usa.canon.com/cusa/home
 www.epson.com
 www.lineco.com
 www.shopping.hp.com
 www.inksupply.com
 www.lexmark.com
 www.lightimpressionsdirect.com
 www.pfile.com
 www.wilhelm-research.com

Films & digital products: www.fujifilmusa.com
 www.ilfordphoto.com/home.asp
 www.kodak.com

Archiving Digital Images

Archival inks: Canon LUCIA Pigment <www.usa.canon.com/cusa/home >
 Epson DURABrite Ultra Pigment <www.epson.com>
 Epson PictureMate Pigment <www.epson.com>
 Epson UltraChrome K3 Pigment <www.epson.com>
 HP Vivera Pigment <www.shopping.hp.com>
 Kodak No. 10 Pigmented <www.kodak.com>
 Lexmark Evercolor2 Pigment <www.lexmark.com>

NOTE: in general, pigment-based inks are superior to dye-based inks, regardless of brand

Photo CDs & DVDs: Delkin Devices Archival Gold <delkin.com>
Mitsui MAM-A Gold Archival <www.mam-a.com>
Verbatim UltraLife Gold Archival <www.verbatim.com>

Photo print papers: Canon Pro Platinum PT-101 <www.usa.canon.com>
Epson Ultra Premium <www.epson.com>
Fujicolor Crystal Archive < www.fujifilmusa.com>
HP Premium Plus <www.shopping.hp.com>
Kodak Ultra Premium <www.kodak.com>
Lexmark PerfectFinish <www.lexmark.com>

Glossary

Aperture: Opening, specifically of the lens, and expressed as a fraction of the focal length; the f/ number such as is printed on the aperture ring of a manual lens.

ASA: The American Standards Association, now the American National Standard Institute. A system of film speed rating once used in the United States. See ISO.

Available Light: The light condition that the photographer finds existing at the subject position. The term usually implies an indoor or nighttime light condition of low intensity requiring fast film, large lens aperture, and slow shutter speed.

Back: That portion of the camera which contains the film; specifically, the complete assembly attached to the rear standard of a view camera which includes the focusing screen, and which accepts the film holders.

Bit: Describes how color information is stored in a digital photograph. The bits mapped to each pixel in a color graphic display determine the pixel's color; the more bits, the better the range of colors represented.

Bracketing: Taking additional photographs slightly underexposed and overexposed from a metered reading, to insure that at least one frame of your subject represents the best lighting possible.

Cable Release: A long flexible cloth or metal braid-covered plunger which screws into a special threaded socket on the shutter or camera body. Compressing the plunger with thumb and finger pressure will release the shutter without much danger of camera movement or vibration.

Camera: Literally, “room” in Latin from Greek *kamara* (vault). The instrument with which photographs are taken consisting, at least, of a light-tight box, a lens which admits focused light, and some device or provision for holding the film in position.

Cartridge: The disposable metal or plastic container in which lengths of film are sold and used. Sometimes called a cassette.

CCD: “Charge Coupled Device”—a light sensor in a digital camera, functionally equivalent to the built-in light meter of typical 35 mm film cameras.

Close-up Photography: The techniques and practice of using supplementary lenses, extension tubes, bellows units, etc. to take pictures at closer ranges than the normal focusing adjustment of an ordinary hand-camera will allow.

CompactFlash: See media card.

Contact Print: A printed photograph, often 8" × 10", of an entire roll of film, used to evaluate the quality of each frame for printing at full size.

CMYK: The cyan, magenta, yellow, black printing/imaging color model. CMYK “four color process” printing creates the appearance of photographic or full color.

Depth of Field: The region of acceptable sharp focus around the subject position, extending toward the camera and away from it, from the plane of sharpest focus. The boundaries of the depth of field are referred to as the near limit and the far limit.

Diaphragm: The assembly of thin metal leaves, usually incorporated into the lens barrel or shutter assembly, which can be adjusted to control the size of the lens aperture.

Digital Image: Any image created by a source such as a digital camera; can be converted to view on a computer or television screen.

Digital Zoom: A type of image magnification on some digital cameras that mimics optical zoom lenses. The digital zoom captures an entire scene but saves only a portion of it, or expands part of it by adding pixels. The result is an image not as sharp as that photographed using an optical zoom lens.

DIN: “Deutsches Institut für Normung e.V.”; film speed rating formerly used in Europe. See ISO.

Download: The process of copying images from a digital camera to a computer; also means transferring any other digital data such as a text document from any source to a computer.

DPI: “Dots per inch”; a measure of resolution in printed images from a digital camera. The higher the dpi number, the better the image resolution.

Electronic Flash: A photographic light source that produces a brilliant flash of light by the discharge of electricity through a gas-filled glass or quartz flash tube. The flash duration is very short, usually less than 1/500 second, and there is no firing delay. Electronic flash is commonly referred to as “strobe light”.

Exposure: The act of subjecting a photosensitive material to the action of light.

File Format: Organization of data in a computer file that enables a program to process it. Examples of “positive” formats for digital photographs are JPEG and TIFF. Whenever a digital photograph is captured, it must be saved in one of these formats, or in one of the unprocessed RAW formats.

Film: Generally, the familiar light-sensitive material used in cameras in the practice of photography. It normally consists of a flexible, thin transparent sheet or strip of acetate or polyester plastic coated on one side with a light-sensitive emulsion, and on the other with a dyed layer of gelatin to reduce curl and halation.

Film Speed: The relative sensitivity of film to light.

Filter: A sheet or disk of plastic, glass or other material, usually colored, which can be used to absorb selected components of transmitted light.

Fish-Eye Lens: A type of super wide-angle lens, or lens attachment, capable of covering a field of about 180°. Fish-eye images are circular if the whole image appears on the film, and are notable for their barrel distortion.

Flash: General name for any photographic light source which produces a very brilliant, very brief pulse of light.

Flash Memory: See memory card.

f/Number: The numerical expression of the aperture diameter of a lens as a fraction of the focal length; the larger the f/number, the smaller the aperture diameter. For example, a lens setting of f/5.6 allows more light to reach the film or digital sensor (i.e., larger aperture diameter) than a setting of f/22.

Focal Length: On a lens, the distance from the sensor or film plane to the center of the lens.

Focus: To adjust a camera, for example, so that an image is formed precisely on the film plane. Also, a term applied to the adjustment of instruments such as binoculars and microscopes so as to provide a visual impression of sharpness in the image.

Frame: To adjust the position and angle of the camera with respect to the subject for the purpose of containing or composing the image within the boundaries of the viewfinder. Also, the useful area and shape of the film or digital image; the “picture.”

Glossy: A print with a mirror-like luster.

Grain: The visible granular texture of the silver [film] image, visually comparable to a “pixelated” digital image.

Granularity: The degree to which a photograph appears to be composed of granules or grains; the distribution of grains in photographic material that has been uniformly exposed and processed.

Image-Editing Program: A computer program that enables the photographer to view, edit, and print digital images. An example is Adobe® Photoshop® Elements.

Interchangeable Lens: A lens that can be removed from the camera body as a complete unit and replaced by another.

ISO: “International Organization for Standardization”; presently used rating system for film speed, replacing ASA & DIN. Digital cameras have a feature with the same label that likewise relates to light sensitivity.

JPEG: “Joint Photographic Experts Group”; a file format often used with digital photographs, denoted by the suffix *.jpg. Because this format compresses the digital image (i.e., taking up less space in digital memory), it is a popular format for sharing digital photographs via e-mail or on web sites.

LCD: “Liquid Crystal Display,” the type of viewing monitor on a digital camera that displays the image; also used on other devices for displaying messages.

Lens: A disk of transparent glass, plastic or other material whose opposite faces are ground into spherical, non-parallel surfaces having a common central axis and capable of forming either a real or virtual image. In photography, the term “lens” usually refers to the complex composite structures of two or more glasses as used in a camera.

Light Meter: An instrument that measures light intensity. If supplied with a suitable computing scale, it becomes an exposure meter. The term is commonly used interchangeably with exposure meter.

Macro-lens: Also occasionally Micro-lens. A term used to describe lenses specially corrected for use at short subject distances, and generally applied only to those supplied for small cameras.

Media Card: See memory card.

Megapixel: One million pixels; a unit of measure used in digital cameras to describe the maximum resolution of a digital image. The larger the megapixel number, the higher the (potential) quality of a digital photograph. For instance, images taken with a 9-megapixel camera at its highest quality setting should be sharper than those made with a 5-megapixel camera.

Memory Card: A removable storage card used in digital cameras. Among the types of memory cards for use in digital cameras are: CompactFlash (CF and CFast 2.0), Memory Stick Duo (MS), MultiMediaCard (MMC), Secure Digital (SD), Micro SD (SD), Secure Digital High Capacity (SDHC, including UHS-1 standard), Secure Digital Extra Capacity (SDXC), and Extreme Digital Picture (xD). Memory cards also may be referred to as flash memory, media cards, or memory sticks, and are the digital equivalent of film in a traditional camera.

Multi Media Card: See memory card.

Negative: Any photographic image in which the subject tones have been reversed. Specifically, the reversed-tone image resulting from the simple development of film exposed in the camera in the conventional process of taking a picture. Digital photos also can be viewed or changed into reversed-tone images via editing software.

Normal Lens: Any lens whose focal length is approximately equal to the diagonal measurement of the film frame. The angular coverage of a normal lens is usually about 55° across the film frame diagonal. The equivalent lens on a digital camera captures an image of about the same scale as that perceived with the naked eye.

Optical Zoom: A lens on either a film or digital camera with a changeable focal length. These lenses change the range of space captured by camera while keeping the image in focus. Such images are sharper (higher quality) than those captured using a digital zoom.

Parallax: An apparent change in the direction of an object, caused by a change in observational position that provides a new line of sight. This is a problem inherent in all cameras without through-the-lens viewing, as your line of sight through the viewfinder is different from that through the lens.

Pixel: Shorthand for “picture element,” referring to the tiny dot of light that is the basic unit of measurement for images made with a digital camera or viewed on a computer screen.

PPI: “Pixels per inch,” a measure of resolution used with scanned images. The higher the ppi number, the better the image resolution.

Print: In photography, commonly used to identify an image on paper, produced by photographic means. It is usually understood to mean a positive image, and implies a final image rather than an intermediate one in some longer process.

Provenience: Location; the position of an artifact or feature defined in three dimensions, and that should be recorded in the caption/log of a photograph.

RAW: any image file format in a digital camera containing minimally processed data from the camera sensor (also in image scanners and motion picture film scanners). Raw files cannot be directly printed or edited until the image is processed and converted to a “positive” file format such as TIFF or JPEG. Thus, in a sense raw files are digital negatives comparable to true negatives in film photography. There are nearly as many raw formats as there are models of digital cameras and film scanners. Because raw files can be converted into uncompressed formats, they are a suitable way to capture images that can be published in technical journals, magazines, or made into enlarged prints.

Reflector: A surface used to reflect light. Photographic reflectors are usually sheets of cardboard, plywood, masonite, or stretched fabric painted white or covered with metal foil. They are useful for reducing the contrast between bright light and shadow.

Resolution: A measure of the quality of a digital image. For scanners, resolution is measured in ppi, while for printers the resolution is measured in dpi. With digital cameras, resolution is measured in megapixels. Higher dpi, ppi, or megapixel numbers generally indicate higher resolution (i.e., better image quality).

RGB: The red, green, blue printing/imaging color model; RGB is additive primary colors. Video displays use RGB to create screen images.

Shadow Area: Any region of a photograph that corresponds to an area of shade or shadow in the original subject. Loosely, any dark area of a positive, or light area of a negative, image.

Sharpness: The subjective impression of clarity of definition and crispness of outline in the rendering of the detail and texture of the photographic image.

Shutter: The mechanism, sometimes electronically controlled, which opens and closes to admit light to the film chamber of a camera and controls the length of the exposure internally.

Slide: A transparency mounted in cardboard, metal, plastic or glass for projection onto a viewing screen.

Soft: Describes an image that is not sharp; that is, one which is blurred, diffused, or not accurately focused.

Stop: The aperture or f/number setting of a lens.

Stop Down: To reduce the size of the aperture of a lens.

Subject: The thing or view photographed.

TIFF: “Tagged Image File Format”; a file format often used with digital photographs, denoted by the suffix *.tif. Because this format does not compress the digital image (i.e., taking up more space in digital memory), printed or published photographs may be significantly sharper than JPEG files. Therefore, it is a popular format for digital photographs to be used in technical journals, magazines, or made into enlarged prints.

USB: “Universal Serial Bus,” a type of connection port widely used to connect scanners and digital cameras to a computer.

[definitions in this glossary are mostly from *Photography* by Philip Davis, Wm. C. Brown & Co., 1976; and *Create and Share Digital Photos* by Gateway, Inc., 2002]