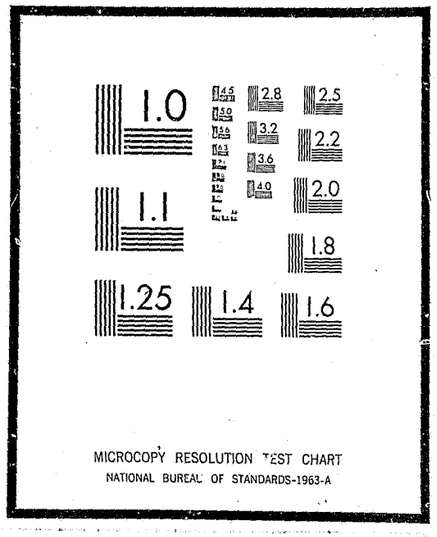

LAW ENFORCEMENT STANDARDS PROGRAM

PHOTOGRAPHIC TERMS AND DEFINITIONS

prepared for the
National Institute of Law Enforcement and Criminal Justice
Law Enforcement Assistance Administration
U. S. Department of Justice

by

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FOREWORD

Following a Congressional mandate[1] to develop new and improved techniques, systems, and equipment to strengthen law enforcement and criminal justice, the National Institute of Law Enforcement and Criminal Justice (NILECJ) has established the Law Enforcement Standards Laboratory (LESL) at the National Bureau of Standards. LESL's function is to conduct research that will assist law enforcement and criminal justice agencies in the selection and procurement of quality equipment.

In response to priorities established by NILECJ, LESL is (1) subjecting existing equipment to laboratory testing and evaluation and (2) conducting research leading to the development of several series of documents, including national voluntary equipment standards, user guidelines, state-of-the-art surveys and other reports.

This document, LESP-RPT-0307.00, "Photographic Terms and Definitions," is a law enforcement equipment report prepared by LESL and issued by NILECJ. Additional reports as well as other documents are being issued under the LESL program in the areas of protective equipment, communications equipment, security systems, weapons, emergency equipment, investigative aids, vehicles and clothing.

Technical comments and suggestions concerning the subject matter of this report are invited from all interested parties. Comments should be addressed to the Program Manager for Standards, National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, U.S. Department of Justice, Washington, D.C. 20531.

Lester D. Shubin
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[1]Section 402(b) of the Omnibus Crime Control and Safe Streets Act of 1968, as amended.

PHOTOGRAPHIC TERMS AND DEFINITIONS

INTRODUCTION

Modern police science is relying more and more on photography in both the documentary (investigative) and surveillance phases of police work. The net result is a marriage of necessity between these overlapping fields. This glossary of photographic terms and definitions is intended to help bridge the communications gap between the broad photographic field and the police profession.

This material was compiled from many sources, including dictionaries, glossaries, technical publications, and the professional literature. It is not an exhaustive treatment, but attempts to list the terms most often encountered in both the written and spoken vocabulary. Accepted definitions were used as found, rewritten into simpler language, or modified to conform to current usage by the photographic community.

It is hoped that these definitions will help police officers in their use of photography as a tool in law enforcement.

TERMS AND DEFINITIONS

ABERRATION — A defect in the optical characteristics of a lens which affects image quality.

ABRASION MARKS — Scratches on negatives and prints caused by rubbing the emulsion before or during development.

ABSOLUTE TEMPERATURE — The temperature of a body expressed on a scale with zero being the lowest possible temperature. On the Kelvin absolute temperature scale, the one usually used in photography, the freezing point of water is 273.15 K. See also *KELVIN*.

ACCELERATOR — The alkali added to a developing solution to increase the activity of the developing agent.

ACCESSORY SHOE — A metal device, fitted to the top of a camera to allow attachment of items, such as a flash unit, view finder, exposure meter, etc.

ACCOMMODATION — The ability of the human eye to automatically focus on objects at varying distances by changing the focal length of its lens.

ACETATE FILM — See *SAFETY FILM*.

ACETIC ACID — A relatively weak acid used in photographic processing solutions. Chemically, it is the same as strong white vinegar.

ACETONE (DIMETHYL KETONE) — A powerful solvent used in motion picture film cement, lacquers, etc.

ACHROMATIC — A type of lens which has been corrected for chromatic (color) aberration for two colors of light.

ACID FIXING BATH — Photographers' "hypo," which "fixes" film by removing the undeveloped silver halides and thereby makes it insensitive to light.

ACTINIC LIGHT — Light that is capable of producing a specific effect such as the exposure of photographic film. Not all wavelengths (colors) of light affect film.

ACTIVATOR — A solution or agent which increases the activity of a developer by increasing its alkalinity. Examples are sodium carbonate and borax.

ACUITY, VISUAL — The resolution or sharpness of human vision.

ACUTANCE — A quantitative measure of the ability to record images of sharp edges.

ADAPTATION — In the human eye, the involuntary change in the diameter of the pupil (which controls the amount of light entering the eye) and the sensitivity of the retina, with variations in the brightness of the scene viewed. It is analogous to automatic exposure control in cameras.

ADAPTER (ADAPTOR) — A device which permits the use on a camera of an otherwise noncompatible attachment, such as a filter, a roll film back, or an accessory lens.

ADDITIVE COLOR — The color process in which the visual effect is caused by the addition of the three colors: red, green, and blue. This is the process used in a color TV set, where the screen is covered with tiny red, green, and blue phosphor dots.

AERIAL IMAGE — A real image existing in space; it can be received on a ground glass, film, or other surface, or picked up by another lens system. See also *REAL IMAGE*.

AERO — Photographic equipment intended for aerial use.

AFFINITY — The chemical attraction of one substance for another.

AFOCAL — An optical system whose object and image points are at infinity.

AGITATION — Shaking or moving the film or the processing solutions to achieve even development.

AIR BELLS — Small bubbles of air which attach to the surface of a film emulsion, leaving a small area unaffected by the solution. They can be removed by vigorous agitation.

AIRBRUSH — A small spray gun used for retouching photographic negatives or prints.

AIRY DISC — The image of a point source at an infinite distance, as formed in the focal plane of a lens. Due to the wave nature of light, this image is never

simply a point, but a small disk, no matter how perfect the lens corrections. The airy disc appears as a round, bright patch of light, surrounded by a series of alternating dark and light rings of increasing diameter and rapidly decreasing brightness.

ALKALI — A chemical used in photo processing solutions to accelerate developer action.

ALUMINUM POTASSIUM SULFATE — A chemical used in photo processing solutions to harden the emulsion. Commonly called alum.

AMBIENT LIGHT — See *AVAILABLE LIGHT.*

ANAMORPHIC — A lens or optical system in which the magnification is different in the horizontal and vertical directions. Used in wide screen movie processes to condense a wide image onto standard film and to expand it when projected onto a wide screen.

ANASTIGMAT — A lens which has been corrected for astigmatism, and therefore focuses vertical and horizontal lines in the same plane with equal brightness and definition.

ANGLE OF FIELD — See *FIELD OF VIEW.*

ANGSTROM UNIT (Symbol Å) — A unit of length equal to 1/10 of a millimicrometer = 1/10 of a nanometer. There are 254,000,000 angstroms in an inch. Used as a unit of measure for atomic distances and the wavelength of light.

ANHYDROUS — Free from water. An anhydrous salt is one that contains no water of crystallization.

ANNEALING — The process of relieving unwanted stresses within a material by means of suitable heat treating.

ANSI — American National Standards Institute; formerly ASA.

ANTIABRASION COATING — A clear overcoating applied to the emulsion or back side of film or paper to reduce scratches and abrasion.

ANTICURL COATING — A gelatin coating applied to the back side of some photographic films to counteract the tendency of the film to curl when exposed to a very dry atmosphere or processing solutions.

ANTIFOGGANT — See *FOG INHIBITOR.*

ANTI-HALATION BACKING — A coating, usually gelatin, on the back of film, containing a dye or pigment for the purpose of absorbing light rays, thus reducing reflection from the back surface of the film base.

ANTIREFLECTION COATING — A thin coating applied to a lens surface to reduce reflection. This improves the image quality by preventing ghost images from light reflections inside the lens. The light transmission of the lens is also improved.

APERTURE — The unobstructed central portion of a camera lens. The aperture is usually variable, by means of an iris diaphragm, and regulates the amount of light which passes through the lens. See also *f-NUMBER* and *f-STOP.*

APOCHROMATIC LENS — A lens which is corrected for chromatic aberration for three wavelengths of light rather than for two, as is the achromatic lens. Generally used by photoengravers and color photographers for very precise color-separation work.

ARCHIVAL QUALITY — The quality of being able to withstand deterioration due to age.

ARC LAMP — A light source, often used for projectors, consisting of a pair of carbon electrodes between which an arc is formed by an electric current.

ARTIFICIAL LIGHT — Illumination provided by incandescent, gaseous discharge, or flame sources as distinguished from light from sources natural to the subject.

ASA — American Standards Association; now ANSI.

ASA SPEED — Film speed rated by the American Standards Association (now called American National Standards Institute or ANSI) method. See also *DIN.*

ASPECT RATIO — The ratio of width to height of an image.

ASPHERIC — Lens surfaces which are not sections of spheres.

ASTIGMATISM — A lens defect resulting in vertical and horizontal lines being focused at different distances from the lens.

AUTOFOCUS — Certain enlargers in which the

image is mechanically kept in focus when the magnification is changed.

AUXILIARY LENS — A lens element which is attached to a camera lens to change its focal length.

AVAILABLE LIGHT — The natural or artificial illumination existing in a scene, with no light added by the photographer.

A-WIND — Single perforated motion picture film wound with perforations along the left edge as seen from the base. Motion picture film with an image that reads correctly when viewed through the emulsion. Film perforated on the opposite edge is called B-wind. See also *B-WIND.*

AXIS, OPTICAL — The optical centerline. The line formed by the coinciding principal axes of a series of optical elements comprising an optical system. It is the line passing through the centers of curvatures of the optical surfaces.

BABY SPOT — A small spotlight using low wattage lamps.

BACK FOCUS — The distance from the rear nodal point of a lens to the focal point. See also *NODAL POINTS.*

BACKGROUND — That part of the picture which surrounds or is more distant from the camera than the principal object.

BACKING — A light-absorbing layer on the back of film or plates to prevent halation.

BACKING CLOTH — An adhesive fabric, used to strengthen a photographic print.

BACKING PAPER — A protective strip of paper to which roll film is attached. Numerals, which can be viewed through a camera window to determine which frame is being exposed, are printed on the side away from the film.

BACKLASH — Looseness or "play" between mating pairs of gears or screw threads.

BACK LIGHT — Illumination from behind the subject.

BAFFLE — To use one or more shields at locations within an optical system to trap or block unwanted and reflected light rays.

BALANCE — Scales used for weighing materials.

BALANCED LIGHTING — Manipulation of the illumination on a subject so that the ratio of shadow to highlight (luminance) does not exceed the range of the photographic material being used. See also *COLOR BALANCE.*

BALL-AND-SOCKET HEAD — A tripod head in which the attaching screw extends from a sphere that is clamped into a mating socket. This allows the camera to be tilted from side to side and front to back, and locked into position.

BARNDOOR (Slang) — Folding wings used in front of studio spotlights to aid in directing the light, and to shade portions of the subject from direct illumination.

BARREL DISTORTION — A lens defect which causes the image of parallel lines to bulge outwards from the center. Also known as negative distortion.

BARREL MOUNT — A tube in which a lens is mounted. Without a shutter, but an iris or other type of diaphragm may be included.

BARRIER-LAYER CELL — A type of photovoltaic (i.e., light generating an electric voltage) cell used in exposure meters and other light measuring instruments. These photocells do not require a battery.

BARYTA — Barium sulphate, applied as a coating to the surface of photographic paper, prior to the application of the emulsion, to increase light reflectance.

BASE DENSITY — The optical density of a film base alone, not including any contribution from the emulsion layer.

BASE LIGHT — Uniform, diffuse illumination approaching a shadowless condition that may be supplemented by other lighting.

BASE PLUG FOG DENSITY — The optical density of a film which has not been exposed, but which has been developed and fixed.

BAS RELIEF — A printing technique resulting in a two-dimensional photograph which gives the appearance of having three dimensions. A negative is bound slightly off register together with a positive transparency of itself. A print made from this combination gives the bas relief effect.

BAYONET BASE — A lamp base which is held in place in a socket by either pins or a flange, rather than the threads used in typical household lamps. Only part of a revolution is required to install or remove the lamp.

BAYONET MOUNT — A lens mount for quickly attaching or removing a lens from a camera by turning through only part of a revolution.

BEADED SCREEN — A surface, used for viewing projected images, made of a white base with a surface of small glass beads.

BEAM LIGHT VIEWFINDER — A system used on some cameras, usually identification, to align camera to subject. A small beam of light is projected from the camera and positioned on the subject's face, eliminating the necessity of sighting through a viewfinder.

BEAM SPLITTER — An optical device for dividing a light beam into two parts. It consists of a partially transmitting mirror.

BEHIND-THE-LENS SHUTTER — A shutter that operates between the lens and the film. (Not normally applied to focal-plane shutters.)

BELLOWS — A folding cloth or leather tube providing a flexible, light-tight enclosure between the lens and the sensitive material.

BELLOWS FACTOR — A numerical factor expressing the decrease in illumination of the film due to the increase in the image distance when the camera is focused on near objects.

BENZOTRIAZOLE — A chemical used as a restrainer or antifoggant in developer solutions.

BETWEEN-THE-LENS SHUTTER — A shutter whose blades operate between two elements of the lens (differentiated from focal-plane, behind-the-lens, and front shutters).

BIG BERTHA — A long-focus camera used for making close-up photographs from a considerable distance.

BINDING TAPE — A heat resistant adhesive tape used to bind two slide cover glasses together with a transparency between them.

BINOCULAR — Having two eyepieces, and therefore permitting the observer to view with both eyes.

BIOCULAR — Having an eyepiece large enough so that both eyes can look through the same lens, rather than through separate ones as in a binocular system.

BLACK-AND-WHITE — Monochrome photographs or processes in which all tones and colors are reproduced as black, various shades of gray, and white.

BLACK-AND-WHITE NEGATIVE — A photographic image on film, plate, or paper, in which light tones are rendered dark and dark tones appear light.

BLACK-AND-WHITE POSITIVE — A photographic image on film, plate, or paper, in which light tones appear light and dark tones are rendered dark.

BLACK LIGHT — Radiant energy lying outside the visible range, in the near ultra violet region of the spectrum.

BLACKOUT — A photoflash lamp having a visually opaque coating transmitting only infrared radiation and used for photography in total darkness.

BLEACH — A chemical compound used to remove silver in reversal, toning, and color processing.

BLIMP — A soundproof housing for a motion picture camera or projector.

BLISTERS — Small areas where emulsion has separated from a film or paper base; caused by developer being carried into a warm stop or fixing bath, wash water falling directly on prints, or too strong an acid stop bath.

BLOCKED UP — Having highlights which are so overexposed or overdeveloped that no detail is visible.

BLOCKING OUT — Painting out undesired background areas on a negative.

BLOWBACK — An enlargement made from microfilm or microfiche.

BLOW-UP (Slang) — Enlargement.

BORIC ACID — A white, crystalline compound used as a buffer in certain developing and fixing solutions.

BOUNCE LIGHT — Flash or tungsten light reflected off ceilings or walls to give the effect of natural or available light.

BOX CAMERA — A simple, fixed-focus roll film camera without bellows, usually with a box-like shape.

BRIGHTNESS — The visual sensation by which an area appears to emit more or less light. The psychological correlate of the physical quantity of luminance.

BRIGHTNESS RANGE — The difference between the maximum and minimum brightness of the field or object from a single point of observation.

BRILLIANT PRINT (OR NEGATIVE) — A photographic print with a bright clear image having good definition and a large brightness range displaying strong shadows and highlights.

BROAD — A type of open, box-shaped reflector containing one or more large incandescent lamps.

BROMIDE DRAG — A processing defect caused by insufficient agitation during development.

BROMIDE PAPER — Paper having an emulsion composed essentially of silver bromide. Generally, fast enlarging paper.

BUCKLE — (1) The jamming of film in a motion picture camera due to improper threading, damaged perforations, or defective mechanism; also applied to motion picture film warped as a result of storage at improper humidity. (2) The bulging of a sheet of film in an enlarger or of a transparency in a projector due to overheating.

BUFFER — A chemical system which tends to maintain a constant acidity (or basicity) in a solution.

BULB EXPOSURE — A camera exposure setting which allows the shutter to remain open as long as the shutter release mechanism is depressed.

BULLSEYE — A type of condensing lens, generally double-convex or plano-convex, used in spotlights and microscope illuminators.

BURNED OUT (Slang) — Over-exposed, and lacking in highlight detail.

BURNING IN (Slang) — A method of darkening parts of a print in which certain parts of the image are given extra exposure while the rest of the image is protected from the light. See also *DODGE*.

B-WIND — Single perforated motion picture film wound with perforations on the right as seen from the base. Also, motion picture film with an image that reads correctly when viewed through the base. See also *A-WIND*.

CABLE RELEASE — A flexible encased wire that is attached to the camera shutter to operate it without causing camera movement or vibration.

CADMIUM SULFIDE CELL — A photoconductive photocell. It requires a battery for operation. Light striking the cadmium sulfide causes the electrical resistance to decrease.

CAMERA ANGLE (Slang) — The position of the camera with respect to the subject.

CAMERA CHAIN — The entire system required to produce a TV signal; i.e., video camera, amplifiers, scanning circuits, and output mixing circuits.

CAMERA MOTION — The movement of a camera during exposure, usually resulting in blurred images.

CAMERA MOUNT — Any device used to anchor a camera.

CAMERA OBSCURA — Originally, a light-tight chamber or tent with a lens or a small aperture in one wall. Now, a small camera with a tracing-paper holder at the back on which the image may be drawn or sketched.

CAMERA, PINHOLE — A camera which has a pinhole aperture in place of a lens.

CANADA BALSAM — An adhesive formerly used to cement optic elements. Sometimes used as a generic name for the newer synthetic optical adhesives.

CANDELA — The unit of luminous intensity. The luminous intensity of 1/600,000 of a square meter of a blackbody at 2045 K.

CANDID CAMERA — Any camera that can be

used to photograph people without their knowledge. The term is usually applied to pictorial photography, not crime surveillance photography.

CANDLEPOWER — The luminous intensity of a source expressed in candelas.

CAPACITANCE — A measure of the electrical energy which can be stored in a capacitor.

CARTRIDGE — A light-tight container which can be loaded with film in the dark and placed in the camera in daylight.

CASSETTE — A film cartridge.

CATADIOPTRIC LENS — A lens containing image-forming reflective elements and usually refractive elements as well. Sometimes called a mirror lens.

CATCHLIGHTS — The small reflections of a light source, found in the eyes of a portrait subject.

CELLULOID (Cellulose Nitrate) — A flammable material, used as a photographic film base in the earlier days of photography, which was replaced by cellulose acetate and most recently by polyester bases.

CELSIUS (Symbol °C) — A temperature scale used in scientific work and most of Europe. One degree Celsius equals one degree Kelvin (K). 0°C is the ice point and 100°C is approximately the boiling point of water. To convert temperature from the Fahrenheit to the Celsius scale, subtract 32 and multiply by 5/9. See also *KELVIN*.

CENTIGRADE — Obsolete term for the Celsius temperature scale.

CENTIMETER (cm) — A measure of length equal to 1/100 of a meter. 1 inch = 2.54 cm.

CHALKY — Having insufficient detail in the lighter portions of the print.

CHANGING BAG — A lightproof bag, fitted with elastic sleeves, in which film holders or developing tanks may be loaded in daylight.

CHANNEL — (1) A complete sound recording, including microphone, amplifier, and recorder. (2) Any one of two or more sound tracks on a movie film and/or the associated equipment.

CHARACTERISTIC CURVE — The curve produced by plotting optical density as a function of the logarithm of the exposure, for a particular sensitive material and development process.

CHEMICAL FOG — Unwanted overall film density caused by excessive development temperature or faulty processing.

CHLORIDE PAPER — A photographic printing paper in which the sensitive material is largely silver chloride. Usually, chloride papers are printed by contact and require comparatively longer exposures than bromide or chlorobromide papers.

CHLOROBROMIDE PAPER — A photographic printing paper used basically for enlarging. Its emulsion contains a mixture of silver chloride and silver bromide.

CHROMA — The attribute of color which describes its purity (strength or saturation). Pink is a low chroma red color.

CIE NORMAL OBSERVER — See *NORMAL OBSERVER*.

CINCH MARKS — Longitudinal scratches on the surface of photographic roll film or paper caused by abrasive particles which scratch the surface when movement occurs between adjacent layers.

CINE CAMERA — Motion picture camera.

CINEMATOGRAPHY — Motion picture photography.

CINEPHOTOMICROGRAPHY — Motion picture photography through a microscope.

CIRCLE OF CONFUSION — The image of a point source, formed by light passing through a lens, on a plane behind the lens. The size of the circle of confusion will be a minimum at the focal plane, and will increase with distance from the focal plane in either direction. For a diffraction limited (effectively perfect) lens, the acceptable circle of confusion could be taken as the size of the airy disc. The term circle of least confusion is used to describe the best focus of an astigmatic lens.

CLAW — A device that moves the film in motion picture cameras and projectors, providing intermittent motion. Also used in some makes of still cameras to advance the film the correct distance for the next exposure.

CLICK STOP — A detent position on an aperture, shutter speed, film speed or other control, which provides a positive and repeatable setting by the use of a spring mechanism which locks the control into one of a series of notches.

CLOSE-UP — A photograph or a motion picture scene taken at very close range; in motion pictures, usually a shot showing only a small area or part of an object or subject.

CLOTH-BACKED — Mounted on linen to make it stiffer and stronger.

CLUMPING — The effective increase in the grain size in an emulsion due to the partial overlapping of the grains of silver.

C MOUNT — A standard threaded lens mount for TV and 16 mm motion picture camera lenses, having 32 threads per inch, a nominal thread diameter of 1.000 inch and a shoulder-to-film distance of 0.690 ± 0.001 inch. (American National Standards Institute).

COATED LENS — See *ANTIREFLECTION COATING*.

COINCIDENCE — Agreement as to position. In a coincidence rangefinder, the two images of a distant object are in "coincidence" when they are in exact alignment.

COLD TONE PRINTS — Photographic paper images that are predominantly blue black as distinguished from neutral black or warm (olive or brown) toned prints.

COLLAGE — A composite photograph made by pasting a number of individual prints to the same background.

COLLIMATE — To produce parallel rays of light by means of a lens or a concave mirror.

COLLIMATOR — (1) A device which produces a beam of parallel light rays. (2) An optical device that makes a target appear to be an infinite distance away. Useful for checking camera focus.

COLOR — The visual sensation produced by light of different wavelengths. Light with a wavelength of 450 nanometers appears blue, of 510 nanometers green, of 575 nanometers yellow, and of 630 nanometers red.

COLOR BALANCE — The relationship between the three images composing a color negative or positive which provides accurate (or, more generally, the desired) reproduction of the natural colors.

COLOR BLIND — See *NON-COLOR-SENSITIZED*.

COLOR COMPENSATING FILTER — A filter used to change the overall color balance of photographic results obtained with color films and to compensate for deficiencies in the quality of the light when printing color films.

COLOR CORRECTION — A lens design feature which enables the lens to bring different wavelengths of light to focus at the same point.

COLOR CORRECTION FILTER — A filter used to correct the color rendering of a negative by matching the color balance of the film to the color quality of the lighting.

COLORIMETER — An instrument used to measure the color of a sample.

COLOR NEGATIVE — A negative record of the color values of the original object.

COLOR SENSITIVITY — The response of a photographic emulsion to light of various wavelengths.

COLOR TEMPERATURE — The color temperature of a light source is the temperature, in Kelvins, to which a blackbody radiator must be heated in order to produce light of the same color as that from the light source.

COLOR TEMPERATURE METER — An instrument for measuring the color temperature of a light source.

COMBINATION PRINT — A composite print made from several negatives.

COMMERCIAL PHOTOGRAPHY — Photography for business, sales, and advertising purposes.

COMPLEMENTARY COLORS — Colors of pigments which, when mixed, produce dark gray or black; colors of light which, when mixed, produce white light. See also *MINUS COLOR*.

COMPOSITE PHOTOGRAPH — A print of two

or more negatives made to appear as a single photograph. See also *MONTAGE* and *COLLAGE*.

COMPOSITION — The arrangement of subject matter in a photograph to produce the desired effect.

CONCAVE LENS — A divergent lens; thicker at its edge than at its center.

CONDENSER — A lens (usually of low f-number) used in an enlarger or a projector to collect the light rays from the source and direct them through the negative or the slide and into the objective lens.

CONDENSER ENLARGER — A photographic enlarger using a condenser lens.

CONJUGATE — The corresponding positions of the object and image points of a given lens. For every possible object point, there is a corresponding (or conjugate) image point.

CONTACT PAPER — Sensitized paper, generally low in speed, used for making photographs by contact printing methods.

CONTACT PRINT — A print made by placing a sensitized emulsion in direct contact with a negative and passing light through the negative.

CONTACT PRINTER — A box or machine providing a light source and a means for holding a negative and the printing paper in contact while they are exposed to the light source.

CONTACT PRINTING — A printing technique giving final images the same size as the original master transparency or negative.

CONTACT-SPEED ROOM LIGHT MATERIALS — Photographic materials which are slow enough to be handled under conditions of ordinary room light for a reasonable period of time without being affected by the ambient light.

CONTINUOUS CONTACT PRINTERS — A printing device that uses raw stock in roll form for contact printing on film or paper.

CONTINUOUS CONTACT PRINTING — A method of printing in which the negative and the unexposed printing stock, in close contact, move at the same speed past a light source.

CONTINUOUS PROCESSOR — An automatic machine that incorporates a conveyer system to transport units of exposed sensitized material consecutively through the processing steps.

CONTINUOUS PROJECTOR — A motion picture projector capable of using a loop of film which runs continuously.

CONTINUOUS TONE — Having the detail and tone values of the subject reproduced by a continuous gradation of gray densities between white and black.

CONTRAST — (1) The maximum difference between tones in a photograph. Where the difference is slight, the photograph is said to be soft; where the difference is marked, it is said to be contrasty. (2) Subject contrast is the difference between the reflection of various areas of a subject. (3) Lighting contrast is the difference in intensities of light falling on various parts of a subject. (4) Inherent emulsion contrast is the possible difference between the maximum and minimum densities of the silver deposits with a minimum variation of exposure. (5) Development contrast is the gamma to which an emulsion is developed. It is controlled by the time, temperature, and agitation during development.

CONTRAST FILTER — A color filter used to make a subject stand out very sharply from surrounding objects.

CONTRAST GRADES — The papers of various contrasts available to match the contrast of the negative being printed. The grades run from 0 (very soft, used for printing contrasty negatives) through 2 (for normal negatives) to 6 (very contrasty, for soft negatives).

CONTRAST PAPER — Photographic paper having a contrasty emulsion used to produce good prints from soft negatives or prints of maximum contrast. Also called hard paper.

CONTRASTY — Having a great difference between tones; sometimes applied to a print having mostly black and white, lacking in middle tones, correctly called chalky.

CONTROL STRIPS — Strips of film that are exposed to a photographic step wedge under controlled conditions. They are processed and measured to evaluate a particular development process, material, or technique. Also known as gamma strips or sensistrips (slang).

CONVERGENT LENS — See *CONVERGING LENS*.

CONVERGING LENS — A lens which bends rays of light passing through it toward its axis. Parallel incident light rays converge at a point of focus. Also known as a convergent, convex or positive lens.

CONVERTIBLE LENS — A lens containing two or more elements which can be used individually or in combination to give a variety of focal lengths.

CONVEX LENS — See *CONVERGING LENS*.

COPPER SULFATE — A chemical used in the toning of bromide papers and in reducing solutions.

COPY — (1) Any document or photograph to be reproduced. (2) The results of such reproduction. (3) The act of reproducing a document.

COPY BOARD — A board or easel to which photographs or other originals are fastened while being copied.

COPYHOLDER — Any device, such as a spring or an arm, used to prevent the movement of material being photographed.

COPYING — The photographic reproduction of original material or prepared art work.

COPYING CAMERA — A camera used for copying. See also *PROCESS CAMERA*.

COPYING FILM — A sensitized material of slow speed, fine grain, and high resolution used to reproduce the finest details and tonal range of the material being copied. See also *LINE FILM*.

CORE — An unflanged, cylindrical device on which sensitized material is wound. The center hole is often keyed to fit a specific type of mandrel.

CORRECTED LENS — A lens designed so that one or more aberrations are minimized.

CORRELATED COLOR TEMPERATURE — See *COLOR TEMPERATURE*.

COUNTER — An automatic device, incorporated in some cameras, printers, synchronizers, recorders, etc., to record the number of exposures made or the footage used or remaining.

COUPLED DIAPHRAGM — An interlocking device that locks a set f-stop and shutter speed so that shifting either one alters the other automatically in such a way as to maintain a constant exposure on the film.

COUPLED RANGEFINDER — A camera-mounted rangefinder, the mechanism of which is linked to the focusing adjustment of the camera, so that the action of finding the distance to a subject also focuses the camera upon the subject.

COUPLER — A chemical compound in a color developer or dispersed in the emulsion which can react with the oxidized developing agent in the sensitized material to form a dye.

COVERAGE — The portion of the total subject included in the lens or camera field. When applied to a camera, coverage is an expression of the angular size of the field which can be imaged on the film.

COVER GLASS — A thin glass plate used to protect the emulsion of a lantern slide or transparency.

COVERING POWER — The maximum area over which a lens can form a sharp image on a plane. This may be expressed as film size for a particular lens.

CRITICAL FOCUS — The point at which a lens gives the sharpest reproduction of a subject.

CROP — To trim or cut away the unwanted portions of a print in order to improve the composition.

CUBIC CENTIMETER — A unit of volume; the volume of a cube one centimeter on each side.

CURTAIN APERTURE — The slit in a focal plane shutter which permits the light to reach the film. The slit size may be either fixed or variable.

CURVATURE OF FIELD — A lens aberration in which the image is formed on a concave surface instead of on a plane; thus, the entire image cannot be brought into critical focus on a flat film or plate.

CURVILINEAR DISTORTION — A lens aberration in which straight lines are imaged as curves.

CUT FILM — See *SHEET FILM*.

CUTOFF — An obstruction of light rays to the

lens, either by the sunshade, the camera bed, or an adjacent lens on a turret.

CUTOUT MOUNT — A mount for a print with an opening through which the print is viewed.

DAGUERREOTYPE — A photograph produced on a silver plate sensitized by fuming with iodine and developed with mercury vapor (obsolete).

DARK ADAPTATION — The increase in sensitivity of the eye that makes vision possible at very low light levels. Eyes may take as long as 35 minutes to dark-adapt. See also *ADAPTATION* and *SCOTOPIC VISION*.

DARKROOM — A room from which all light which could affect undeveloped sensitized material has been excluded. It is used for loading unexposed material and for the unloading and processing of exposed film or paper.

DARKROOM CAMERA — A precision process camera mounted in a darkroom wall so that the copyboard is in a white light area and the camera back is in the photographic darkroom.

DARKROOM LOADING — The process of loading sensitized material under conditions of total darkness or specified safelight, to avoid fogging.

DARK SLIDE — The light-proof cover, removable by a sliding motion, covering sensitized material in some magazines, holders, or cassettes.

DAYLIGHT — Light consisting of skylight or a combination of sunlight and skylight. The spectral quality of daylight varies widely with atmospheric conditions and the position of the sun. In clear weather, with the sun about 40° above the horizon, the correlated color temperature of daylight is approximately 5500 K.

DAYLIGHT LOADING — Cameras, film magazines, or developing tanks which permit the insertion of film in daylight, without the use of a darkroom or a changing bag.

DAYLIGHT TANK — A tank for processing film which is loaded in darkness but which may be charged with solutions and drained in normal light.

DECKLE EDGE — A rough or irregularly trimmed edge on a sheet of paper, simulating the natural edge of handmade paper.

DEFECTS, BEAUTY — Imperfections on optical surfaces that are visible, but do not impair performance.

DEFINITION — Distinctness or clarity of reproduction in a photograph.

DEGREE — (1) A unit of temperature. (2) A unit of angle 1/360 of a circle.

DEHUMIDIFY — To remove moisture from a material or from the air in an enclosed space.

DELAYED ACTION UNIT — A device on the shutter of a camera which permits the shutter to trip about 10 seconds after it is released. Also known as a self-timer.

DENSE — Very dark; a negative transparency which is overexposed, overdeveloped, or both.

DENSITOMETER — An instrument designed to measure the optical density of a negative or print.

DENSITY, DIFFUSE — The optical density of a material measured under specified conditions of highly diffuse light, as opposed to non-diffuse or specular light.

DENSITY, OPTICAL — The negative logarithm of the transmission of a photographic negative, or the reflectance of a photographic print.

DENSITY WEDGE — A strip of paper or film that has graduated known densities or tones from white to black.

DEPTH OF FIELD — The distance between the points nearest to and farthest from the camera which are in acceptably sharp focus. See also *CIRCLE of CONFUSION*.

DEPTH OF FIELD SCALE — A scale indicating the depth of field of a lens, at specific distance and aperture settings.

DEPTH OF FOCUS — The allowable tolerance in lens-to-film distance within which an acceptably sharp image of the subject focused upon will still be obtained, at the particular lens aperture used.

DESENSITIZATION — A technique by which the sensitivity of a photographic material to subsequent exposure is greatly reduced without destroying the latent image.

DESICCATE — Extract the water from a substance.

DETECTIVE CAMERA — An early name for what is now called a candid camera.

DEVELOPED IMAGE — The visible image resulting from the processing (development) of an exposed sensitized material.

DEVELOPED SILVER — Silver produced by the reduction of the light sensitive silver halide through a development process.

DEVELOPER — A solution used to make visible the latent image in an exposed emulsion.

DEVELOPING AGENT — A chemical compound possessing the ability to change exposed silver halide to black metallic silver, while leaving the unexposed halide unaffected.

DEVELOPING-OUT PAPER — A sensitized photographic printing paper which forms a latent image when exposed to light and requires chemical processing for this image to become visible. Abbreviated D.O.P.

DEVELOPMENT — The process by which a latent image on exposed sensitized material is converted to a visible image.

DEVELOPMENT BY INSPECTION — The development of negatives or prints based on the operator's judgment as to when development is complete. (Done under a safelight.)

DIAPHRAGM — An adjustable aperture used to vary the effective diameter of a lens, thus allowing the amount of light passing through it to be varied. The most common type is the iris diaphragm.

DIAPHRAGM STOP — The aperture opening of a diaphragm.

DIAZOTYPE — A photographic printing process, such as Ozalid, based on the bleaching of certain diazonium compounds by light.

DICHROIC COATING — Usually a multilayer film, applied to glass, which has the property of selective transmission or reflection. Also a coating on a lens, although this coating is designed to be non-selective. See also *ANTIREFLECTION COATING*.

DICHROIC FOG — A form of chemical fog in which the fog deposit appears red by transmitted light and green by reflected light.

DIELECTRIC — An electrically insulating material such as the insulation between the plates of a capacitor.

DIFFRACTION — The minute bending of a light ray at the edge of an opaque barrier. The limiting factor in determining the smallest detail which light can record.

DIFFRACTION DISC — See *AIRY DISC*.

DIFFUSE ENLARGER — A photographic enlarger that has a diffused light source. It usually produces lower image contrast than a condenser enlarger and minimizes scratches and other imperfections in the negative.

DIFFUSE LIGHT SOURCE — A large area source which emits light in all directions. The shadows of objects illuminated by such a source, if present, are not sharply defined.

DIFFUSER (DIFFUSION SCREEN) — A device attached to a lens to soften the outlines and details of the reproduced image. Also, translucent fiberglass, gauze, or other material introduced into a lighting setup to increase the dispersion and reduce the harshness of the lighting on the subject.

DIFFUSE REFLECTION — The type of reflection obtained from a non-glossy surface in which the reflected rays are scattered in all directions.

DIFFUSION — The softening of sharp lines in an image by means of special lenses or lens attachments. Also, the scattering of light rays from a non-glossy surface or the transmission of light through a translucent medium.

DIMENSIONAL STABILITY — The ability of photographic materials to maintain constant dimensions and shape when subjected to the effects of temperature, humidity, processing, aging, or mechanical force.

DIMMER — A rheostat, transformer, or other device used to adjust the intensity of an incandescent light source.

DIN — European system of measuring film speed, analogous to the ASA system.

DINKY-INKIE — A miniature spotlight using a 150- or 200-watt lamp.

DIOPTER — A measure of lens magnifying power; the reciprocal of the focal length of the lens in meters.

DIRECT FINDER — A viewfinder through which the subject is seen directly without optical elements, such as a wire finder or a spot finder.

DIRECTIONAL PROJECTION SCREEN — A screen that concentrates much of the reflected light into one general direction and will therefore appear brighter in the direction of concentration and proportionally darker as the angle of viewing increases from the chosen direction. Beaded, lenticular, and some metallic screens have directional properties.

DIRECT POSITIVE PROCESS — A technique for producing a positive image directly from a positive master or from the subject itself.

DISPERSION — The variable deviation, as a function of wavelength, of light passing at an angle through a surface between two transparent media of different densities; the separation of white light into a spectrum, as by a prism.

DISSOLVE — (1) To make a solution, as to dissolve a solid in a liquid. (2) In motion pictures, to fade out one scene and simultaneously fade in the next, so that one scene appears to melt into the other.

DISTANCE METER — An instrument used for measuring the distance to a particular object. Also known as a range finder.

DISTILLED WATER — Water which has been purified by being converted into steam and condensed into water again. Used for making solutions when impurities in the normal water supply render it unsatisfactory.

DISTORTION — An incorrect rendering of the shape of a subject caused by lens imperfections.

DIVERGENT LENS — A lens which bends the rays of light away from its axis. Also called a negative lens.

D-LOG E CURVE — See *CHARACTERISTIC CURVE.*

DOCUMENT WEIGHT PAPER — See *LIGHTWEIGHT PAPER.*

DOCUMENTARY — A motion picture that depicts a factual presentation of a certain period, phenomenon, or event.

DODGE — To shade a portion of the paper during printing to lighten the corresponding area. See also *BURNING IN.*

DOLLY — A rolling platform for a camera or other heavy equipment.

DOUBLE EXPOSURE — The accidental or deliberate superimposition of two or more images on sensitized material.

DOUBLE EXTENSION — A camera or bellows which may be extended to twice the focal length of its lens.

DOUBLE FRAME IMAGE — The normal 35mm still camera image, which measures 24 x 36mm (1 x 1 1/2 inches), equivalent to two full frames of standard 35mm motion picture film. See also *HALF-FRAME.*

DOUBLE IMAGE — A blurred picture caused by movement of the camera or the subject during exposure.

DOUBLE PRINTING — Printing from two or more negatives to make one picture; for example, to use a second negative to print clouds into a landscape.

DOUBLE SYSTEM — A motion picture sound recording technique employing a separate camera and sound recorder which are synchronized electronically.

DOUBLET — A compound lens consisting of two elements. If the inner surfaces are cemented together, it is called a "cemented doublet," otherwise an "air-spaced doublet."

DOUBLE WEIGHT PAPER — Heavier weight photographic paper, with an average thickness within the range of 0.282 to 0.483 mm (0.0111 to 0.0190 in).

DOWSER — A light shutter, either manually or electrically operated, attached to the front of a projector lamphouse, between the condenser lens and the film gate.

DROP BED — A camera bed which may be lowered to avoid interference with the view of a wide-angle lens.

DROP FRONT — A type of lens board which permits lowering the lens below the center of the film.

DRY MOUNTING TISSUE — A thin sheet of paper, impregnated with shellac or other thermoplastic resin, used to attach prints to album leaves or mounting boards by the application of heat.

EASEL — A device used to keep sensitive paper flat while enlarging; also used to hold photographs flat while they are being copied.

EFFECTIVE APERTURE — The diameter of the lens diaphragm as measured through the front lens element.

EFFICIENCY — The relationship, expressed as a percentage, between the length of time a shutter is fully open and the length of time from the start of opening to fully closed.

EFFICIENCY OF A LENS — See *TRANSMITTANCE.*

ELECTRIC DISCHARGE LAMP — A lamp in which light is produced by the passage of electricity through a metallic vapor or a gas enclosed in a tube or bulb. Also known as a gas discharge lamp.

ELECTRIC EYE — A detector, or detector system, by which exposure settings on a camera are automatically or semi-automatically set. A photoelectric cell.

ELECTROMECHANICAL SHUTTER — A mechanically operated shutter using electronic means for controlling the exposure duration. A shutter of this type can be coupled directly to a photoelectric light sensing element for automatic exposure control.

ELECTRONIC FLASH — A light source for photographic illumination that produces a high intensity flash of short duration (1/1000 second or less) by means of an electrical discharge through a gas in an enclosed tube. The device is capable of repeated use.

ELECTRONIC FLASH METER — An exposure meter which is used to measure the total light output of a flashtube or of a photoflash lamp.

EMULSION — The light-sensitive coating on films, plates, or papers, consisting of a mixture of silver salts and other chemicals emulsified in gelatin.

EMULSION BLISTERS — Tiny bubbles in a film or paper coating caused by chemical action.

EMULSION LAYER — Any film coating which contains light sensitive material, as distinguished from the backing, base, substratum, or filter layers.

EMULSION NUMBER — A number used by photographic film, plate, and paper manufacturers to identify the coating data. Film lot number.

EMULSION SIDE — That side of photographic film, paper, or plates on which the emulsion has been coated.

EMULSION SPEED — See *FILM SPEED.*

ENLARGED NEGATIVE — A negative made from a smaller one.

ENLARGEMENT — A print made from a smaller negative through a projection process.

ENLARGEMENT RATIO — The ratio of the length of an object in an enlargement to the length of that object in the negative.

ENLARGER — An optical projector for forming an enlarged image of a negative on sensitized paper.

ENLARGING — The process of producing, by projection printing, an image or a copy larger than the intermediate or original.

ENLARGING LENS — A lens, used for projection printing, which produces good images at the short object distances used in enlarging.

ENLARGING PAPER — A fast photographic paper which is exposed by projecting a divergent light beam through a negative onto the paper emulsion.

EQUIVALENT FOCAL LENGTH — The focal length of a group of lenses considered as a single lens.

ESTAR (Trade name) — See *POLYESTER FILM.*

ETCH — To scrape away some of the density of a negative (during retouching) by means of a knife.

ETHYL ALCOHOL — Grain alcohol; ethanol.

EVEREADY CASE — A camera carrying case with a cover that is easily removed to permit operation of the camera.

EXHAUSTION — The process of using up the active materials in a solution until it becomes inactive.

EXISTING LIGHT — See *AVAILABLE LIGHT.*

EXPIRATION DATE — A date indicated on a photographic product, after which the characteristics of the product may have changed sufficiently to degrade its performance.

EXPOSURE — (1) The amount of light incident on a sensitive emulsion. (2) The shutter speed and f-number used to take a particular picture.

EXPOSURE GUIDE — A tabulation of data useful for calculating the correct exposure for a given film, subject, and illumination. See also *FILM SPEED.*

EXPOSURE INDEX — A rating of the light sensitivity of a photographic film, used in conjuction with an exposure meter to determine the proper shutter speed and f-stop for taking a picture.

EXPOSURE INDICATOR — A means for indicating the number of exposures made or still available.

EXPOSURE LATITUDE — The range of exposures on a film that will result in satisfactory photographs.

EXPOSURE METER — An instrument for measuring light and determining correct exposure.

EXPOSURE NUMBERS (ROLL FILM) — Consecutive numbers or sets of numbers printed on the outside of the backing paper, which serve to determine the spacing of the exposures as these numbers are successively brought into position in the window of the camera.

EXPOSURE TIME — The length of time the shutter is open.

EXTENSION TUBE — A tube which may be inserted between a lens and a camera to permit focusing on very close objects.

EYE-LEVEL — Applied to viewfinders which are designed for direct viewing, as opposed to those having reflecting type optics for viewing above or below eye level.

EYE LIGHT — A light source placed to produce a specular reflection from the eyes of a portrait subject. See also *CATCHLIGHTS.*

EYEPIECE — The lens group in an optical device which is nearest the eye and with which the image formed by the preceding elements is viewed.

EYE SHIELD — A shield on the viewfinder or eyepiece of an optical device, to prevent stray light from reaching the eye of the observer and to maintain proper eye distance from the lens system.

FADE — (1) Deterioration in a finished positive or negative image. (2) A controlled gradual lightening or darkening at the beginning or end of a motion picture scene.

FAHRENHEIT — A temperature scale in which the freezing point of water is taken as 32 degrees and its boiling point as 212 degrees. Fahrenheit temperatures may be converted to Celsius temperatures by the following formula: °C = 5/9 (°F-32).

FARMER'S REDUCER — A solution of potassium ferricyanide and sodium thiosulfate, invented by Howard Farmer, which lowers the density of developed negatives and prints and which tends to increase their contrast.

FAR POINT — The farthest object from the camera whose image is still acceptably sharp when the camera is focused at a given distance. See also *DEPTH OF FIELD.*

FAST — Having a high photographic speed. Applied to a photographic process as a whole, or any element in such a process, such as the optical system, emulsion, or developer.

FAST FILM (OR FAST EMULSION) — A photographic material of high sensitivity to light, having a high exposure index or ASA rating.

FAST LENS — A lens which has a large relative aperture, or small f-number; for example, f/1.2. See also *LENS SPEED.*

FEED SPOOL — A spool which contains unexposed film or paper.

FERROTYPE PLATE — A sheet of thin enameled metal, chromium plated steel or stainless steel, on which prints are dried face down to produce a high-gloss finish.

FIELD — The area covered or "seen" by a camera or lens.

FIELD LENS — A positive lens, located near the focal point of the objective lens, used to increase the size of the field that can be observed at full intensity.

FIELD OF VIEW — The angle of view covered by a lens. A wide angle lens sees more of the field around a subject than a narrow angle or telephoto lens.

FILAMENT — That part of an incandescent lamp, composed of resistance wire, which becomes luminous when heated by the passage of electric current.

FILL-IN LIGHT — Secondary illumination directed to illuminate shadow areas and avoid excess brightness range. Also known as a fill light.

FILM — A transparent flexible material coated with a light sensitive emulsion on one or both surfaces. It comes in sheets and perforated and non-perforated rolls.

FILM ABRASION — Physical damage to film by wear.

FILM ADVANCE — The mechanism which moves the film in a camera.

FILM BACKING — Any coating placed on the back or non-emulsion surface of sensitized film to prevent curl, eliminate halation, or for other purposes.

FILM BASE — The transparent material on which an emulsion is coated.

FILM CARTRIDGE — A light-tight container for film, with an opening that permits the film to be pulled through it.

FILM CEMENT — A solution of cellulose acetate or nitrate in a volatile solvent, used to join strips of motion picture film.

FILM CLEANER — A liquid used to remove dirt, dust, and grease from a film without injuring the base or the emulsion.

FILM CLIP — (1) A clamp used to hold film while it is processed or dried. (2) a short motion picture sequence.

FILM GATE — The aperture unit of a still, microfilm or motion picture camera, which determines the size and shape of the recorded image.

FILM HANGER — A frame of non-corrodible material on which film is suspended for processing.

FILM HOLDER — A light-tight photographic film container used for transporting film before and after exposure and for positioning it in the camera. Mechanical variations are the sheet film or cut film holders, film pack holders, and roll film holders (the latter two are sometimes called adapters).

FILM JACKET — A transparent plastic single or multiple sleeve or pocket made to hold and protect processed film.

FILM LEADER — The part of a film roll preceding the first picture, used to thread the film into the exposing, processing, printing, or projection apparatus.

FILM LOADER — A device to aid in inserting sensitized film into cassettes, holders, magazines, etc., prior to exposure or processing.

FILM MAGAZINE — A light-tight, rigid, sometimes reloadable container for holding film either in or out of the camera.

FILM PACK — A daylight loading unit containing eight or more films attached to paper tabs, so that the films can be successively exposed in the focal plane of a camera and then withdrawn to the rear of the pack.

FILM PACK ADAPTER — A holder which permits a film pack to be used in a camera designed for plates or sheet film.

FILM PERFORATIONS — The regularly and accurately spaced holes that are punched throughout the length of some films and are engaged by the teeth of various sprockets and pins by which the film is transported and positioned as it travels through cameras, processing machines, projectors, and other film handling devices.

FILM PLANE — The plane within a camera, normal to the optical axis, at which the emulsion side of the film is positioned.

FILM SLIDE MOUNT — A frame of cardboard, metal, plastic, or glass holding a film transparency for use in projection equipment.

FILM SPEED — A number assigned to a photographic film to indicate its relative sensitivity to visible light or other radiant energy under controlled conditions of exposure and development.

FILM STRIP — A series of positive transparencies on a continuous length of film, for use in a one-frame-at-a-time projector.

FILM STRIP PROJECTOR — A projector designed for projecting film strips. May include sound, to which the strip pictures are synchronized.

FILM TANK — A light-tight container, used in film processing, which holds the solutions in which the films are immersed.

FILM TENSION — The amount of pull, continuously applied to film during operation within a machine, which keeps the film tracking properly and prevents it from sagging against surfaces which might scratch it.

FILM TRANSPORT MECHANISM — The mechanical system of a camera, processor, printer, or projector which moves the film.

FILM TRIMMING GUIDE — A metal form which guides one in cutting the ends of film correctly for loading magazines.

FILTER — A piece of glass, plastic or gelatin having the property of selectively absorbing light of different wavelengths or of different polarizations.

FILTER FACTOR — The number by which the unfiltered correct exposure must be multiplied to obtain the same exposure with the filter. It varies with the light and the film, for the same filter.

FILTER HOLDER — A device to hold a glass or gelatin filter in front of a lens.

FILTER PAPER — A porous paper used to strain solid impurities from solutions.

FILTER, ULTRAVIOLET — A light filter which transmits ultraviolet and absorbs visible light.

FINDER — A viewer through which the scene to be photographed may be seen.

FINE GRAIN — Film emulsion in which the grain is small. Important for those pictures that will be greatly enlarged.

FINE GRAIN DEVELOPER — A developer of low potential, which does not result in the clumping of silver into coarse grains with a consequent loss of detail in the picture.

FINGERPRINT CAMERA — A fixed-focus camera with built-in lights, used to photograph fingerprints, stamps, and other small objects.

FIRE SHUTTER — A device in a motion picture projector which protects the film when it is standing still or moving too slowly with the light source turned on. It may be entirely opaque or may transmit a safe amount of light (heat).

FIRST GENERATION COPY — A copy made directly from an original, as opposed to second, third, or higher generation copies made from copies.

FISH EYE — An extremely wide angle lens, having an angle of view of 180 degrees or more, which produces a circular image in which vertical and horizontal straight lines are distorted into curves away from the center of the image.

FIX — To preserve a developed photographic image by removing any remaining light-sensitive material, thus avoiding further chemical reaction resulting from exposure of the photograph to light.

FIXED-FOCUS — Focused for a specific distance at the time of manufacture and having no provision for changing the focus.

FIXING AGENT — A chemical which dissolves the unused silver halide, thus preserving the developed image from further chemical reaction upon subsequent exposure to light. See also *HYPO*.

FLANGE — (1) A metal ring used to fasten a lens and/or a shutter to the front of a camera. (2) The part of a lens barrel used as a locating surface in coupling the lens to a camera body. When the lens is mounted on the camera, the camera flange and lens flange are in contact. Not all cameras or lenses have flanges.

FLANGE FOCAL DISTANCE — The distance from the locating surface of the lens mount to the focal plane.

FLARE — Ghost images produced by internal reflections in the lens, lens mount and camera body, caused by light from a bright source incident on the external surface of the lens.

FLASH BULB — See *PHOTOFLASH LAMP*.

FLASH CUBE — A cubical device containing four small photoflash lamps, each with its own reflector mounted on a plastic base. The entire assembly is enclosed in a sealed plastic cover.

FLASH DURATION — The time interval from the instant the flash reaches one third of its peak intensity to the instant it decays to the same value.

FLASH EXPOSURE — A camera exposure using a light flash for the main light source.

FLASH GUIDE NUMBER — A numerical value associated with a given photoflash lamp and film speed, to assist in determining exposure. The guide number, divided by the distance to the subject in feet, gives the required f-number.

FLASH GUN — The battery case, lamp socket, and reflector used with photoflash lamps.

FLASH LAMP — See *PHOTOFLASH LAMP*.

FLASH SYNCHRONIZER — A device for synchronizing the shutter of a camera with a flash-type source so that the shutter is fully opened when the lamp reaches its peak or near maximum intensity. See also *SYNCHRONIZED SHUTTER*.

FLASHTUBE — The light source of an electronic flash unit, which produces a high intensity flash of short duration (1/500 second or less) by means of an electrical discharge through an atmosphere of gas (usually xenon) in an enclosed tube. The tube is capable of repeated use.

FLAT — Lacking contrast, in a print or negative.

FLAT LIGHTING — Photographic illumination that minimizes contrast and shadows, such as front, diffused, or bounce lighting.

FLATNESS OF FIELD — The quality of a lens which produces sharpness of focus both at the edges and at the center of the image.

FLOATING LID — A cover designed to fit loosely within the walls of a solution container. It floats on the surface of the solution to lower the evaporation rate of the water and prolong the working life of the solution by minimizing the air-solution surface area.

FLOOD LAMP — A lamp or lighting unit producing a broad beam or flood of light. Colloquially used as a contraction for photoflood lamp.

FLUORESCENCE — The process by which a substance absorbs electromagnetic radiation at one wavelength and emits visible light at a longer wavelength. The excitation producing the visible light can be in forms other than electromagnetic radiation, such as high speed electrons.

FLUORESCENCE PHOTOGRAPHY — The photographic recording of visible light emitted from an object irradiated with ultraviolet light.

FLUORESCENT LAMP — A lamp in which the radiant energy (ultraviolet light) from an electric discharge is transformed by suitable materials (phosphors) into visible light, giving higher luminance.

f-NUMBER — The ratio of the focal length of a lens to the diameter of the lens opening. It is written as the lower case f followed by a slash, followed by the numerical ratio. For example, if the diaphragm of a lens is set so that it is 5mm in diameter, and its focal length is 40mm, the f-number is 8 and is written f/8.

FOAMING — The formation of bubbles on the surface of processing solutions as a result of agitation or chemical reaction. Foaming can be reduced by the use of an antifoam agent.

FOCAL LENGTH — The distance from the second (image) principal plane of a lens to the focal plane, for an object at infinity. For the simple case of a thin lens, this is the distance from the center of the lens to the point at which an infinitely distant object is focused.

FOCAL PLANE — The plane containing the focal point, perpendicular to the lens axis.

FOCAL-PLANE SHUTTER — A shutter which operates immediately in front of the film (which is at the focal plane). A shutter of this type usually consists of a fixed or variable-width slit in a curtain of cloth or metal, which travels across the film to make the exposure.

FOCUS (FOCAL POINT) — (1) The point at which converging rays of light from a lens meet. (2) To adjust the distance between the lens and the film for maximum image sharpness at a particular object distance.

FOCUSING CLOTH — An opaque black cloth used to shade the focusing screen of a camera and the eyes of the photographer, so that he can more easily see the image on the ground glass.

FOCUSING HOOD — A collapsible tube which shades the focusing screen of a camera.

FOCUSING MAGNIFIER — A lens through which the image on the focusing screen of a camera is viewed for critical focusing.

FOCUSING MOUNT — A spirally threaded tube in which a lens is mounted. Focusing is accomplished by rotating the mount, which moves the lens closer to or further from the film.

FOCUSING NEGATIVE — A negative containing sharply defined geometrical patterns, which is used as an aid in focusing an enlarger or a projector.

FOCUSING SCALE — A graduated scale on a lens barrel or a camera, permitting focusing on a given subject by estimating its distance from the camera and setting a pointer to that distance.

FOCUSING SCREEN — The ground glass or other translucent surface on which camera images are visually focused.

FOG — Non-image photographic density. The defect is due either to the action of stray light, to improperly compounded processing solutions, or to improperly stored or outdated photographic materials.

FOGGING AGENTS — Substances which reduce the silver halide in a silver sensitized system without exposure to light.

FOG INHIBITOR — A chemical used in photographic processing solutions to minimize chemical fog.

FOLDER — A type of photo mount, usually of the slip-in type, with folding cover.

FOLDING CAMERA — A camera having a collapsible bellows so that it may be closed for carrying.

FOOTAGE COUNTER — A device on a motion picture camera, bulk film magazine, and some types of projectors, to indicate either the amount of film used or remaining unexposed.

FOOTCANDLE — A unit of illumination (one lumen per square foot). The light falling on a surface placed one foot distant from a point light source of one candela.

FOOTCANDLE SECOND — A unit of light that may be used in specifying photographic exposure. The number of footcandle seconds is equal to the product of the illumination in footcandles and the time in seconds.

FOOTLAMBERT — A unit of luminance, equal to one lumen per π square foot. Note that this unit is used for light coming from a surface and footcandle is used for light incident on a surface.

FORCING — The technique of using overdevelopment to produce greater optical density in sensitized material.

FOREGROUND — That part of a scene closer to the camera than the main subject.

FORMAT — The size and shape of the opening or aperture within the camera, usually square or rectangular, which frames the film, allowing it to be exposed within that area only.

FORMULA — (1) A list of ingredients and quantities necessary to compound a photographic solution. (2) The mathematical relationship between the elements in a compound.

FRAME — One individual picture on a strip of film.

FRAME-LINE — The narrow, unexposed area between adjacent frames on a strip of film.

FRAMER — The adjustment on a projector to center the frame within the aperture.

FRAME SIZE — The dimensions of a given picture area.

FRAMES PER SECOND — The number of individual exposures made in a motion picture camera during one second, or projected by a motion picture projector during one second.

FREE APERTURE (FILM APERTURE) — The mask inside the camera determining the boundaries to which the film will be exposed. This determines the format.

FREQUENCY — A rate of oscillation or vibration. For light and other electromagnetic waves, the rate of oscillation of the electromagnetic field propagating the waves. The frequency of the light determines its color.

FRESNEL LENS — A relatively thin lens consisting of a series of concentric stepped rings, each one being a section of a curved surface. The combined effect of all the rings is the same as that of a simple lens with the same diameter and curvature.

FRICTION HEAD — A camera mount for tripods or other supports, which provides a smooth frictional resistance to camera movement in order to minimize irregularities of movement in panning.

FRILLING — The detachment of film emulsion from its support around the edges, most often caused by too much alkali or too high a temperature in the developer.

FRONT LENS — (1) The first element of a lens system; that through which the ray enters. (2) Sometimes used by lens manufacturers as a designation for a supplementary lens to be placed in front of a lens system.

FRONT LIGHTING — Illumination on the subject coming from near the camera position.

FRONT SHUTTER — Any shutter other than a focal-plane shutter. May also be designated as between-the-lens, before-the-lens, or behind-the-lens shutter.

FRONT SURFACE MIRROR — A mirror on which the reflecting material is applied to the front instead of to the back surface of the glass.

f-STOP — The setting, usually indicated on the lens barrel, which gives a particular f-number.

F-TYPE FLASHBULB — A flashbulb which produces its maximum light output very quickly after the igniting current is supplied.

F-TYPE SYNCHRONIZED SHUTTER — A shutter mechanism designed for F-type flash lamps. (M type flash lamps can also be used with this shutter at relatively slow shutter speeds.) Fixed focus cameras usually have this type of shutter synchronization. The time delay to complete the circuit and fire the flash lamp is from two to five milliseconds.

FULL APERTURE — The maximum opening of a lens or lens diaphragm.

FULL FRAME — Photographs which use the negative area as originally photographed, without cropping.

FULL OF HOLES (Slang) — (A photograph) having many small dark areas lacking in detail.

FULL STOP — A change in the f-stop setting of a lens aperture which increases or decreases the amount of light which can pass through the lens by a factor of two. To accomplish this, the f-stop and thereby the diameter of the aperture must be changed by a factor of 1.4, (i.e., the square root of two). Thus, a full stop change from a setting of f/2.8 would be either f/2.0 or f/4.0.

FUZZY — Soft, out of focus.

GAMMA — A measure of the contrast properties of film, equal to the slope of the straight line portion of the characteristic curve, which represents the density versus the logarithm of the exposure. A gamma of one in a negative means that the range of density in the negative is approximately the same as the range of light, on a logarithmic scale, in the subject photographed.

GAMMA INFINITY — The maximum contrast to which an emulsion can be developed.

GAS BELLS — Bubbles which force an emulsion from its support, caused by strong chemical action and resulting in minute holes in the emulsion.

GELATIN — A transparent, colloidal material used as a medium in which silver salts are suspended for coating on photographic film and paper.

GELATIN FILTER — A light filter consisting of a gelatin sheet in which the light absorbing pigment or dye is incorporated. When maximum durability is required, the gelatin filter may be cemented between sheets of optically flat glass.

GHOST IMAGES — Spurious images due to the reflection of light by a bright subject, by the elements of the lens, or by its mounting. See also *FLARE*.

GLACIAL ACETIC ACID — Highly concentrated acetic acid, usually 99 percent.

GLASS FILTER — A light filter consisting of an optically flat galss containing light absorbing pigment.

GLASS PLATE — A thin sheet of emulsion-coated glass for use in photography.

GLOSSY — Applied to photographic papers which are heavily coated with gelatin so that they can be ferrotyped.

GLOSSY PRINT — A photograph whose surface has been ferrotyped to a hard, shiny appearance.

GLOW-LAMP — A partially evacuated, gas-filled lamp having two electrodes, which emits light on application of the proper voltage to its terminals.

GLYCERIN — A clear viscous liquid, which mixes readily with water and alcohol, used to improve gloss and to prevent the cracking of emulsion surfaces during and after the ferrotyping of prints.

GLYCERIN SANDWICH — A scratched or damaged negative placed between glass plates coated with glycerin, which temporarily fills in the scratches, in order to reduce visible scratches in the projected image or prints made of the image.

GRADATION — The rate of increase of density with exposure (one factor of contrast).

GRADIENT — As applied to the characteristic curve, the slope of any chosen part of the curve, distinguished from gamma, which refers to the slope of the straight-line portion of the curve only.

GRADUATE — A container for liquids marked off to measure various volumes.

GRAIN (gr.) — (1) A unit of weight, in the avoirdupois system, 437.5 grains equal one ounce. (2) A small particle of the silver halide in gelatin which makes up photographic emulsion or of the metallic silver in the developed negative.

GRAININESS — A mottled effect in a negative due to clumping of the silver particles which form the image. Controlled by emulsion, development conditions, and developer type.

GRAM (g) — A metric unit of mass (or weight), equal to approximately 15.4 grains. There are 453 grams in one pound avoirdupois.

GRANULAR — (Dry chemicals) in the form of grains or tiny lumps, resulting from the breaking up of crystals in manufacture.

GRAY — The colorless shade formed by blending black and white in any proportion.

GRAY SCALE — A strip of paper or film having a graudated series of tones from white to black, used in controlling the contrast of photographic reproductions. Also known as step wedge, step tablet, etc.

GROUND GLASS — A sheet of glass with a rough grained or matte, translucent surface used as a focusing screen, diffusing screen, etc.

GROUND GLASS SUBSTITUTE — A liquid coating which dries to a frosted effect on ordinary glass.

GUIDE NUMBER — A value assigned to a photographic flood or flash lamp in accordance with ANSI Standard PH2.4 to characterize its light output in terms useful in exposure calculations. The guide number for a particular lamp used with a particular film is divided by the distance in feet from the lamp to the subject to find the f-number for proper exposure (diaphragm stop).

GYRO HEAD — A tripod head using the inertia of a flywheel driven by the head movement to insure smooth camera movement during panning.

HALATION — A fog or halo around brilliantly lighted objects, due to light which has passed completely through the emulsion and is subsequently reflected back into the emulsion by the film base.

HALF-FRAME — A 35mm still camera image which is half the area of the full 24 x 36mm frame size.

HALFTONE — (1) A photomechanical process for reproducing continuous tone pictures. (2) A middle, or grey tone lying between the shadows and highlights.

HALF STOP — A change in the f-stop setting of a lens aperture which increases or decreases the amount of light which can pass through the lens by a factor of 1.5. To accomplish this, the f-stop, and thereby the aperture diameter, must be changed by a factor of 1.2 (i.e., the fourth root of two). Thus, a half stop change from a setting of f/2.8 would be either f/3.4 or f/2.3.

HALIDE — Any simple compound of iodine, bromine, chlorine, or flourine in combination with a metallic element. In photography, the word refers principally to silver bromide, silver iodide, or silver chloride.

HALOGEN — The chemical family name for the elements iodine, bromine, chlorine, and flourine.

HALOGEN LAMP — See *QUARTZ HALOGEN LAMP.*

HALVING LINE — The line dividing the two half images in a split field rangefinder. The rangefinder is focused by bringing the two half images to a point where they match or are aligned at the halving line.

HAND CAMERA — A camera whose weight and size is such that it can be used without a tripod for support.

H AND D CURVE (HURTER AND DRIFFIELD) — See *CHARACTERISTIC CURVE.*

HANGER — A device to hold one or more pieces of sensitized material during processing.

HARD — Having high contrast.

HARDENER — A chemical which makes the gelatin of an emulsion insoluble and prevents it from softening in hot weather or a warm developer. Some commonly used hardeners are aluminum chloride, aluminum potassium sulfate, chromium potassium sulfate, and formaldehyde.

HAZE — An atmospheric condition in which objects seen at a distance are obscured by fogginess.

HEAD SCREEN — A small diffuser used in portraiture to soften the light falling on the subject's head.

HEAT FILTER — A filter, generally glass, which absorbs radiant energy of long wavelengths (infrared) without absorbing light from the visible range. Used to reduce buckling and overheating of the film in enlargers, printers, and projectors.

HELICAL MOUNT — A spirally threaded lens mount which permits focusing by rotating the movable part of the lens tube.

HIGH ANGLE SHOT — A scene photographed with a camera placed above the action and aimed at a downward angle.

HIGH CONTRAST — Having highlights and shadows represented by extreme differences of density.

HIGH HAT — A very low camera stand or mount.

HIGH-KEY — A print with the majority of its tones consisting of light grays and white.

HIGHLIGHTING — Lighting used to emphasize the central point of interest in a scene.

HIGHLIGHTS — The brightest parts of the subject, represented by the denser parts of the negative and by the light gray and white tones of the print.

HIGH RESOLUTION EMULSION — An emulsion capable of recording very fine detail.

HIGH SPEED MOTION PICTURES — Motion pictures taken at a large number of frames per second. The playback of such film at normal speed (18-24 frames/sec.) permits observing the motion slowed down by factors from 10 to 1000.

HIGH SPEED PHOTOGRAPH — A photograph of stopped motion taken at a shutter speed faster than 1/1000 second.

HOLD BACK — To shade portions of an image while printing, in order to avoid excessive density. See also *DODGE.*

HORIZONTAL ENLARGER — An enlarger which travels on a horizontal track; used very little except for photomurals and similar large prints.

HORIZONTAL SWING — Pivots permitting movement of the camera back or the lens board around a vertical axis.

HOT SPOT — A small area in a scene which has received an excessive amount of light.

HUE — The characteristic of a color which distinguishes it from gray or another color.

HUMIDITY — The water vapor content of the atmosphere. See also *RELATIVE HUMIDITY.*

HUMIDITY COEFFICIENT OF EXPANSION & CONTRACTION — The change in the length of a substance for each one percent change in relative humidity, at a given temperature.

HYDRATE — A chemical compound containing water of crystalization; for example, sodium carbonate comes in anhydrous form and two hydrated forms, the monohydrate (containing 1 molecule of water) and the decahydrate (containing 10 molecules of water).

HYDROMETER — An instrument used to measure the specific gravity of liquids.

HYGROSCOPIC — Having the ability to extract

moisture from the air. Glycerin and calcium chloride are common examples.

HYPERFOCAL DISTANCE — The distance from a camera such that, if an object at that point is in sharp focus, then all objects from one-half that distance to infinity give satisfactory definition on the film.

HYPERSENSITIZING — Resulting in an increase in the sensitivity of an emulsion; for example, fuming or bathing with ammonia, fuming with mercury, etc.

HYPO — (1) Sodium thiosulfate (incorrectly called sodium hyposulfite), a chemical used in fixing baths. (2) The complete fixing bath, containing sodium thiosulfate and various acids, hardening agents, etc.

HYPO CLEARING BATH — A solution used between the fixing bath and the washing of prints and negatives to reduce the time necessary to wash out the hypo.

HYPO TEST — A method of checking the completeness of washing by putting the drippings of wash water from the film or print into a test solution.

IDENTIFICATION CAMERA — A camera used to photograph the head and shoulders of a subject, leaving space within the frame area for a data card.

ILLUMINANCE — A non-preferred term for *ILLUMINATION*.

ILLUMINANCE SCALE — The ratio of the greatest to the least illuminance on the image plane.

ILLUMINANT C — A standard light source defined by the Commission International de l'Eclairage (CIE). This source is often used to simulate average north sky daylight. The color temperature is 6500 K.

ILLUMINATION — The luminous flux per unit area incident on a surface. Common units are lumen per square foot (footcandle) and lumen per square meter (lux).

ILLUMINATION LEVEL — The amount of light falling on a surface, measured in footcandles, meter candles, lumens per square foot, lumens per square meter or lux.

IMAGE — A representation of an object produced by means of light rays. An image-forming optical element forms an image by collecting light rays diverging from object points and converging them toward image points.

IMAGE AREA — The area of a sheet of sensitized material occupied by the image.

IMAGE BRIGHTNESS — The apparent brightness of the image seen through an optical system. This brightness depends on the brightness of the object, and on the transmission, magnification, distortion, and diameter of the exit pupil of the instrument.

IMAGE DISTANCE — The axial distance between the image and the second principal point of a lens.

IMAGE MOTION — The blur or loss of sharp detail in a photograph recording a moving object.

IMAGE PLANE — The plane in which the image lies or is formed. A real image formed by a converging lens would be visible upon a screen in this plane. When the image plane coincides with the film plane in the camera, the camera is in focus.

IMAGE QUALITY — The fidelity with which an image represents the object.

IMAGE SAFETY TIME — One-half the maximum time an exposed, unprocessed sensitized material can be exposed to a specified darkroom safelight illumination without noticeable change in image density.

IMBIBITION PROCESS — A process for making prints by the selective absorption of dyes on a gelatin or similar surface.

INCANDESCENT — Glowing with heat, such as the tungsten filament in a common light bulb.

INCIDENT LIGHT — The light which strikes an object, distinguished from the light reflected from or transmitted by the object.

INCIDENT LIGHT METER — An exposure meter which determines the correct exposure from the amount of light falling on the subject, as opposed to that reflected from the subject.

INDEX OF REFRACTION — A measure of the light bending power of a transparent medium, equal to

the ratio of the speed of the light in a vacuum to that in the medium.

INDICATING STOPBATH — A stopbath containing a sensitive dye which changes color when the acidity of the bath falls to a predetermined point.

INDIRECT LIGHTING — The illumination of a subject by reflected light. Also known as bounce, soft, or flat lighting.

INERTIA — The exposure indicated by the intersection of the straight-line part of the characteristic curve with the log exposure axis. It is an inverse measure of the speed of the film.

INFINITY — A distance from the camera sufficiently great that light rays from that point appear to reach the lens in parallel rays. With most photographic equipment, any distance beyond 100 feet could be considered infinity. The symbol, ∞, represents the camera focusing scale marking for infinity.

INFRARED FILM — Film coated with an emulsion especially sensitive to infrared radiation.

INFRARED FILTER — A filter that transmits only infrared light.

INFRARED LIGHT — Light whose wavelength is longer than that of the red of the visible spectrum and therefore beyond the receptive power of the human eye. Light of wavelengths longer than 780 nanometers.

INFRARED PHOTOGRAPHY — The production of an image by the photographic action of infrared radiation on infrared sensitized films or plates.

INHERENT CONTRAST — A condition in which the contrast of a given sensitized material is fixed in manufacturing and cannot be significantly altered by changes in exposure and processing.

INSTANTANEOUS — The snapshot marking on a single speed shutter, indicating that exposures will be timed automatically at about 1/25 second. See also *BULB EXPOSURE* and *TIME EXPOSURE*.

INTENSIFICATION — A chemical process for the increase of the density or contrast, or both, of underdeveloped or underexposed negatives.

INTERLEAVING PAPER — Paper sheets placed between sheet films in packaging to protect them from damage and deterioration before use.

INTERMITTENCY EFFECT — The failure of several short exposures to give the same photographic effect as a continuous exposure of the same total duration. See also *RECIPROCITY LAW*.

INTERMITTENT MOVEMENT — The manner in which a mechanical device moves and stops motion picture film for exposure or projection.

INTERMITTENT PROJECTOR — Any motion picture projector in which the film and optical parts are motionless while the shutter is open, and the film moves one frame at a time while the shutter is closed.

INTERNATIONAL SYSTEM OF UNITS (SI system) — The international metric system of measurement units. Any physical quantity can be expressed in terms of these base units: the meter (length), kilogram (mass), second (time), ampere (electric current), Kelvin (temperature), mole (amount of substance), candela (luminous intensity), radian (plane angle) and steradian (solid angle).

INTERPUPILLARY DISTANCE (IPD) — The distance between the centers of the two eye pupils, when the subject is viewing distant objects.

INTERVAL TIMER — (1) A clock mechanism to turn a device on for a specified period of time. (2) An enlarger timer.

INVERSE SQUARE LAW — A physical law which states that illumination varies inversely with the square of the distance from a point source of light.

INVERTED — Turned upside down. The usual effect of a lens upon the image.

INVISIBLE RAYS — Electromagnetic rays which are not visible to the human eye and which have wavelengths either shorter than about 400 or longer than about 780 nanometers.

IRIS DIAPHRAGM — A device used to control the size of the aperture in a camera lens so that the amount of light passing through the lens can be varied. This device is composed of a series of overlapping leaves operated by a revolving ring. The opening is approximately circular. So called because of its functional similarity to the iris of the human eye.

IRIS LENS MOUNT — A heavily built iris diaphragm used to clamp lenses of various sizes to the

front of a camera.

IRRADIANCE — The radiant energy per unit area incident upon a surface. See also *ILLUMINATION*.

JAMMING — Piling up of film in a camera, cassette, or magazine due to a film transport malfunction. Also known as buckling.

JUMP IMAGE — The displacement of a projected image due to mechanical difficulties in the camera or the projector.

KELVIN (K) — The unit of temperature difference on the Kelvin absolute temperature scale, equal to one degree Celsius (°c). The Kelvin temperature scale is used to characterize the color temperature of light sources. See also *ABSOLUTE TEMPERATURE*.

KEY — The prevailing tone of a photograph, as high-key (light), low-key (dark) or medium-key.

KEY LIGHT — The main source of illumination on an object.

KEY SLOT — A slot, in the flange or hub of a film spool or cassette, which is engaged by the film winding key of camera. Also known as turning slot.

KILOGRAM (kg) — A unit of mass; 1000 grams; equal to approximately 2.2 lb.

KILOWATT (kW) — A unit of power; 1000 watts.

KINESCOPE — The picture tube, or cathode ray tube, on which the received image is formed in a television receiver.

KINESCOPE RECORDING — A motion picture film of a television broadcast, made by photographing the image on the face of a kinescope.

KLIEGLIGHT (OR KLIEG LIGHT) — A large arc lamp used in motion picture photography. Sometimes applied incorrectly to any photoflood lamp.

LABORATORY PACKING — Unexposed motion picture film which is wound on a plain hub, not on a daylight-loading spool.

LAMBERT — A unit of luminance (photometric brightness) equal to $1/\pi$ candela per square centimeter.

LANTERN SLIDE — A positive transparency prepared for projection in a slide projector. Standard sizes are 3 1/4 by 4 inches and 2 by 2 inches.

LAP MARKS — A processing defect which is characterized by longitudinal marks along the length of the film and which is usually caused by defective rollers.

LATENSIFICATION — Intensification of a latent image by a uniform low intensity pre-exposure, or by chemical means before development.

LATENT IMAGE — An image recorded by light in a sensitive emulsion, which remains invisible until developed.

LATENT IMAGE FADING — The regression of a latent image which is not developed immediately after exposure. The fading depends on time, temperature, humidity, and type of emulsion.

LATITUDE OF EXPOSURE — The amount by which a negative may be overexposed or underexposed without appreciable loss of image quality.

LAY UP — Placing material to be copied on the copyboard of a copying camera.

LEADER — A strip of film or paper at the beginning of a roll of film which is used for loading the camera or projector.

LENS — An optical element, usually glass, with curved surfaces, that has the property of forming images. A camera lens is normally a combination of several glass elements. The term is also applied to a lens in its housing, which may contain the diaphragm and even the shutter.

LENS BARREL — The mechanical structure supporting the elements or components of a lens. See also *BARREL MOUNT*.

LENS BOARD — The plate, usually removable, in which the lens is mounted in large format cameras and enlargers.

LENS CAP — A protective cover for the end of a lens barrel.

LENS COATING — A transparent mineral layer, of carefully controlled composition and thickness, evaporated onto the surfaces of lenses and other optical parts to reduce their surface reflections and thus increase the brightness and quality of the photographic image.

LENS FLARE — Scattered light, resulting from reflections at optical surfaces or from imperfections in the optical system, which reaches the image plane and produces ghost images.

LENS SHADE — A camera accessory used to shield the lens from extraneous light.

LENS SPEED — The maximum effective light-gathering power of a lens, which dictates the minimum object illumination and exposure requirements. Lens speed is inversely proportional to the f-number squared and is directly proportional to the area of the lens aperture.

LENS STOP — A lens setting which determines the size of the aperture and hence the amount of light passing through the lens.

LENS SYSTEM — Two or more lenses arranged to work in conjunction with one another.

LENS TISSUE — A grit-free, soft, lintless paper especially prepared for cleaning the surfaces of lenses and other optical elements.

LENS TURRET — A revolving plate carrying several lenses attaching to the front of a camera in such a way that any lens may be placed in position for use by revolving the plate.

LENTICULATIONS (LENTICULES) — Minute optical elements having the form of cylindrical or spherical lenses embossed on the back side of a photographic film. These lenses form a part of the optical system used in certain additive color processes. Lenticules are also used on projection screens to concentrate the reflected light.

LIGHT — In general, electromagnetic radiation at wavelengths longer than X-rays and shorter than microwaves. Specifically, visible light is electromagnetic radiation capable of producing a visual response in the human eye, usually considered to be in the wavelength range of 400 to 780 nanometers.

LIGHT BOX — A box with a diffusing glass top, illuminated from within, used for photographing transparent objects or to provide a white shadowless background.

LIGHT FOG — The fog produced over an image by accidental exposure of film or paper to extraneous light.

LIGHT METER — An instrument for measuring illumination and determining exposure.

LIGHT PIPE — A conduit through which light is conducted from one end to the other by means of reflections at the walls.

LIGHT POLARIZER — See *POLARIZING FILTER*.

LIGHT RAY — The path of travel of a photon or the normal to the wave front of a light wave, indicating its direction of travel.

LIGHT SCATTERING — Diffusion of light by reflection from a matte surface so that light rays travel in random directions. Light scattering can also take place by reflections from particles of moisture or solid matter suspended in the atmosphere.

LIGHT-STRUCK — Film that has been fogged either accidentally or on purpose.

LIGHT TABLE — A work table with a translucent top illuminated from below, used in the retouching of negatives.

LIGHT TRAP — (1) A system of staggered passageways or double doors such that a darkroom may be entered or left without light being admitted. (2) A narrow passage lined with black velvet, permitting the passage of film but not light in a cassette, film magazine, or holder.

LIGHTWEIGHT PAPER — Photographic paper with an average thickness within the range of 0.109 to 0.150 mm (0.0043 to 0.0059 in). Also known as standard weight and document weight paper.

LIMITING ANGLE OF RESOLUTION — A measure of the image quality of an optical system. The angular separation of two points (or a pair of parallel lines) which are just far enough apart to permit them to be distinguished as separate by the system.

LINEAR FIELD — The width of the field of view at any specified distance.

LINEAR MAGNIFICATION — The ratio of a linear dimension in an image to the corresponding linear dimension in the object.

LINE COPY — Original material to be copied, containing only black and white areas or lines, without intermediate grays, such as printing or line drawings.

LINE FILM — High contrast black and white film especially designed for use in line and screen work. See also *COPYING FILM*.

LINE LIGHTING — A type of lighting for portrait photography in which a profile shows an edge of light. Sometimes erroneously called Rembrandt lighting.

LINE NEGATIVE — A transparency consisting of only black and white, without intermediate grays.

LINEAR PERSPECTIVE — The impression of depth or distance in a photograph due to the diminishing of the size of objects in proportion to their distance from the camera.

LINE SPREAD FUNCTION — The irradiance in the image of a narrow illuminated slit, plotted as a function of the distance normal to the length of the image. One measure of image quality.

LIP SYNC — Short for lip synchronization. The process by which picture and sound are accurately synchronized so that, in the case of a speaking actor, the lips move as the appropriate words are heard.

LITER (l) — A unit of volume; 1000 cubic centimeters; equal to approximately 1.06 quarts.

LOAD — To insert film into a camera, film holder, or plate holder.

LOCAL INTENSIFICATION — Increasing the contrast of a portion of a negative by the local application of an intensifier solution.

LOCAL REDUCTION — The reduction of the optical density of a portion of a negative by the local application of a reducer or by rubbing with an abrasive paste.

LOCATING BACK — A plate, operated by either vacuum or air pressure, that holds film flat in the focal plane during exposure.

LONG FOCUS LENS — A lens having a focal length substantially greater than the diameter of the image that it forms.

LONG SCALE — A density scale (or contrast negative) in which the least dense portion will transmit 50 to 100 times more light than the most dense portion. A long scale (or soft) printing paper is one in which the exposure that is required to produce the deepest black is 50 to 100 times that required to produce a barely visible gray.

LOW CONTRAST — A relationship of image tones in which there is relatively little difference between the densities of the highlights and the shadows.

LOW-KEY — Applied to a picture in which the majority of the tones range from dark gray to black.

LUMEN (lm) — A unit of luminous flux. The luminous flux emitted by a point source of 1 candela into a solid angle of one steradian.

LUMEN SECOND — A unit of luminous energy equal to one lumen of luminous flux flowing for one second.

LUMINANCE (PHOTOMETRIC BRIGHTNESS) — The visible light emitted by, transmitted by, or reflected from a surface per unit area and unit solid angle; its unit is the candela per square meter.

LUMINANCE RANGE — The ratio of maximum to minimum luminance.

LUMINESCENCE — Emission of visible light by a process not involving incandescence, and therefore occurring at low temperatures. Normally prefixed by the exciting source, as in electroluminescence, chemiluminescence, thermoluminescence, etc.

LUMINOUS FLUX — The time rate of flow of visible light. Its unit is the lumen.

LUMINOUS INTENSITY — The brightness of a (point) source of light. Its unit is the candela (formerly candle).

MACROPHOTOGRAPHY — (1) Making of enlarged copies of negatives or pictures. (2) Photography of objects at low magnification. See also *PHOTOMACROGRAPHY*.

MAGAZINE — The container holding the film-

feed and take-up spools of a motion picture or still camera. Also, a device for holding and exposing from 12 to 18 sheet films or plates in succession.

MAGNESIUM FLUORIDE — A compound commonly used as an antireflection coating on lens surfaces.

MAGNETIC FILM — Movie film which has had a strip of magnetic material added along one of its edges for recording a sound track. This magnetic material is the same as that used in the magnetic tape recording of sound, and the sound is recorded in the same manner. This strip may be added to the film before exposure or after processing.

MAGNETIC SOUND — Sound which is recorded and reproduced magnetically on magnetic film. Also, sound recorded on a separate magnetic tape recorder.

MAGNIFICATION — The ratio of the linear dimensions of an optical image to the corresponding dimensions of the object. Magnification is usually used to mean lateral magnification where the dimensions are transverse to the optic axis. Magnification is not applied to a camera because magnification varies with distance. Magnification can be applied to a negative or photograph. Longitudinal magnification applies to dimensions parallel to the optic axis, and is only used for relating quantities, such as depths of focus to depth of field.

MAGNIFIER — A lens or lens system forming a magnified virtual image of an object placed between the lens and its front focal point.

MAGNIFYING POWER — 250 divided by the focal length of a microscope or telescope lens in millimeters; alternatively, 10 divided by the focal length in inches.

MARGINAL RAYS — Rays of light passing through an optical element near the edge of its aperture, far from the optic axis.

MASK — (1) A sheet of thin black paper, metal, or plastic used to produce white margins on a photograph. (2) A transparency used with a color negative or positive to secure color correction in printing.

MASKING — (1) Use of a color filter to correct for a spectral absorptive deficiency in pigments, dyes, and emulsions in three color photography. This improves the accuracy of color reproduction. (2) The act of covering with an opaque mask.

MASTER — The original negative or positive from which reproductions are made.

MAT — A cutout mount; a piece of cardboard with an opening cut in it, which is used to outline a mounted photograph.

MATTE — Diffusely reflecting, with little or no gloss.

MATTE BACK — A film without gloss on the reverse side, for easier retouching.

MATTE SCREEN — A glossless projection screen that appears almost equally bright when viewed from different directions.

MEAN SPHERICAL CANDLEPOWER — See *MEAN SPHERICAL INTENSITY*.

MEAN SPHERICAL INTENSITY — The average value of luminous intensity of a source with respect to all directions. The mean value obtained by taking the total luminous flux (in lumens) output of the source and dividing by 4π steradians. The unit is the candela.

MEDIUM-KEY — Applied to a picture in which the majority of the tones are medium grays, with only a small proportion of solid black or pure white.

MEDIUM WEIGHT PAPER — Photographic paper with an average thickness within the range of 0.211 to 0.282 mm (0.0083 to 0.0111 in).

MENISCUS LENS — A positive or negative, crescent shaped lens consisting of one concave and one convex spherical surface.

MERCURIC CHLORIDE TEST — A chemical test method for measuring residual hypo (fixer). Also known as the Crabtree test.

MERCURY VAPOR LAMP — A light source consisting of a tube filled with mercury vapor, which glows on the passage of an electric current.

METALLIC SCREEN — A projection screen with a reflecting surface of smooth or lenticulated metal, or a surface metallized by a covering of aluminum or other metallic paint. Such screens can be made so as not to depolarize light and are used for viewing polarized-light three-dimensional pictures.

METER — A unit of length equal to 39.37 inches.

METER CANDLE (LUX) — A unit of illumination equal to one lumen per square meter.

METER-CANDLE-SECOND — A unit of exposure. One second of exposure to illumination (on the film) of one lumen per square meter.

METHANOL — See *METHYL ALCOHOL.*

METHYL ALCOHOL — A volatile solvent used to prepare developing solutions and for rapid drying of films and prints. It is highly poisonous and can cause blindness or death if taken internally. Also known as wood alcohol.

METOL — A popular developing agent, which is sold under trade names such as Elon, Pictol, and Rhodal, and used in many developer formulas. Its chemical name is monomethylparaminophenol sulfate.

METOL HYDROQUINONE (MQ) — A photographic developer which employs a combination of metol and hydroquinone (quinol) as the developing agent. It is the most commonly used developing agent.

METRIC SYSTEM — A decimal system of measurement based in part on the meter as the unit of length, the kilogram as the unit of mass, and the second as the unit of time. See also *INTERNATIONAL SYSTEM OF UNITS.*

MICRO — A prefix used in the metric system. It signifies one millionth of the designated quantity; 1 microsecond equals .000001 or 10^{-6} second.

MICRODENSITOMETER — An optical instrument that can measure the density of very small image areas on a photographic plate or film.

MICROFICHE — Multiple micro images in a grid pattern on a transparent sheet of film. It usually contains a title which can be read without magnification. It is a common format for presenting microfilm records.

MICROFILM — Multiple small images of document pages recorded on a continuous strip of very high resolution, fine grain film.

MICRON — An obsolete term for micrometer, a millionth of a meter.

MICROPHOTOGRAPHY — The reproduction of copy in a size too small to be read without magnification. See also *PHOTOMICROGRAPHY* (not a synonym).

MICROPROJECTOR — A projector for microscope slides.

MICROSCOPE — An optical instrument for producing enlarged images of small, near objects. Microscopes are of two types: "simple" and "compound." A simple microscope produces but one image of an object; in a compound microscope, an objective lens first forms an image, and this primary image is further magnified by an eyepiece.

MICROSCOPIC COPY — Reproduced copy requiring magnification before becoming readable or usable.

MIDTONES — The range between highlights and shadows of a photograph.

MIL — 0.001 inch.

MILKY — Having the appearance of milk. A term applied to the appearance of incompletely fixed films or plates, and to incorrectly prepared fixing baths.

MILLI — Prefix meaning 1/1,000.

MILLILAMBERT — A unit of luminance equal to 0.001 lambert.

MILLILITER — A unit of volume; 0.001 liter; 1 cubic centimeter.

MILLIMETER — 1/1,000 of a meter; 25.4 millimeters is exactly equal to one inch.

MILLIMICRON — Properly called nanometer; equal to .001 micrometer (10^{-9} meter). The wavelength of light is often given in millimicrons.

MILLIPHOT — A unit of illumination; one milliphot equals 10 lux or 0.929 footcandles.

MILLISECOND — A unit of time equal to 0.001 second.

MINIATURE CAMERA — Any small handheld camera, particularly one using 35mm film. Smaller cameras are frequently termed sub-miniature.

MINIMUM DENSITY — The lowest density obtainable in a film system.

MINUS BLUE — Yellow, or a filter which transmits green and red but not blue light.

MINUS COLOR — A color that is complementary to another. The complementary color is absorbed by an object while other components of the spectrum are reflected or transmitted to produce the color perceived.

MINUS GREEN — Magenta, or a filter which transmits blue and red but not green light.

MINUS RED — Cyan, or a filter which transmits green but not red light.

MIRED — a contraction for Micro-Reciprocal Degrees Kelvin. Thus, a color temperature of 3000 K may be expressed as $10^6/3{,}000$ or 333.3 mireds.

MIRED FILTER — A filter which raises or lowers the color temperature of a light source. The mired value or mired shift value of a filter is given by $(1/T_1 - 1/T_2)\ 10^6$, where T_1 is the color temperature in Kelvins of the light source and T_2 is the apparent color temperature in Kelvins of the light source viewed through the filter.

MIRROR — A smooth, highly polished surface for reflecting light. It may be plane or curved. Usually a thin coating of silver or aluminum on glass constitutes the actual reflecting surface. When this surface is applied to the front face of a glass, the mirror is known as a front surface mirror.

MIRROR IMAGE — The reversed image of an object as seen in a mirror.

MIRROR LENS — See *CATADIOPTRIC LENS.*

MIXED REFLECTION — The simultaneous occurrence of specular and diffuse reflection.

MODELING — The representation of the third dimension in a photograph by the controlled placement of highlights and shadows.

MODULATION TRANSFER FUNCTION (MTF) — A measure of the quality of the image produced by an optical system, or the ability of a photographic (or other) system to record information. It is the ratio of the system output to its input for sinusoidal test patterns, plotted as a function of spatial frequency in the image. Also known as sine wave response. See also *OPTICAL TRANSFER FUNCTION.*

MOIRE PATTERN — A periodic pattern produced by superimposing two similar periodic patterns slightly out of register. Specifically, a pattern of squares or other shapes formed when two halftoned screens are superimposed. The screens may be of the same spacing but slightly out of register or of slightly different spacing.

MOLECULAR WEIGHT — The sum of the atomic weights of the atoms making up a compound.

MOLECULE — The smallest amount of a chemical substance which can exist and still retain its characteristics.

MONOBATH — A single solution processing bath that contains both the developing and fixing chemicals.

MONOCHROMATIC — Containing light of only one wavelength or color.

MONOCULAR — Pertaining to one eye.

MONOHYDRATED — Containing one molecule of water per formula unit.

MONOPOD — A one-leg camera support.

MONORAIL — A single rail supporting a large format camera.

MONTAGE — A composite picture made by having a number of exposures on the same film, by projecting a number of negatives to make a composite print, by cutting and mounting a number of prints and subsequently copying them to a new negative, or by any of a number of similar processes. See also *COLLAGE.*

MORDANT — A chemical which absorbs and holds dyes.

MOSAIC — An assemblage of photographs, the edges of which have been matched to form a continuous photographic representation. Particularly applied to photographs of a portion of the earth's surface.

MOTION PICTURE CAMERA — A camera designed to produce a sequential series of pictures which produce an illusion of object motion when projected onto a screen. The camera includes a spring or electric motor which drives an intermittent or continuous film advance mechanism in synchronism with the shutter mechanism. The shutter permits light to

enter as each frame of film is positioned for exposure.

MOTION PICTURE FILM — A thin flexible ribbon of transparent plastic having perforations and bearing one or more sensitized layers capable of producing photographic images in a motion picture camera.

MOTION PICTURE PROJECTOR — A mechanical device for projecting motion picture film, silent or sound, on a screen. Sound projectors can reproduce optically printed and/or magnetic sound tracks.

MOTTLING — Random light and dark areas which appear on negatives or prints which have not been sufficiently agitated during processing.

MOUNT — The cardboard or paper support to which a print is fastened for display.

MOUNTING TISSUE — Thin paper coated with a heat-sensitive adhesive, used for fastening prints to their mounts.

M-Q DEVELOPER — See *METOL HYDROQUINONE.*

M-TYPE SYNCHRONIZED SHUTTER — An internally synchronized front shutter with a time delay from 13 to 17 milliseconds between the closing of the electrical contacts and the full opening of the shutter. It is designed for operation with M-type flashlamps.

MUG SHOT — A photograph showing head and shoulders, both side and front views.

MULTI-CAMERA INSTALLATION — Three or more cameras mounted so as to provide a small amount of image overlap between adjacent cameras for the purpose of providing extended lateral coverage with long focal length, large scale cameras.

MULTILAYER — Containing two or more layers, such as a film or glass plate coated with two or more layers of emulsion of differing characteristics. These include double-coated plates for reduction of halation effects, and 2- or 3-layer films for color photography.

MULTIPLE CAMERA — A camera which makes a number of small photographs on a single large film or plate.

MULTIPLE EXPOSURE — (1) Two or more adjacent exposures of the same image as made by a multiple camera. (2) Several exposures of the same film. See also *DOUBLE EXPOSURE.*

MULTIPLE FLASHLAMP HOLDER — A flashgun having three separate reflectors. The mechanical arrangement permits individual ignition of each flashlamp or the ignition of all three at one time.

MULTIPLYING BACK — A sliding back for view cameras designed to make a large number of negatives in rows on a single plate or film.

MUNSELL NOTATION — The quantitative designation for a color in the Munsell system.

MUNSELL SYSTEM — A method of classifying and designating opaque surface colors.

MYLAR (Trade name) — See *POLYESTER FILM.*

NANO — Prefix meaning one-billionth (1/1,000,000,000).

NANOMETER — The preferred name for millimicron. A unit of length equal to 10^{-9} meter.

NANOSECOND — A unit of time equal to 10^{-9} second (0.001 microsecond).

NATIONAL FORMULARY (N.F.) — A listing of official standards of the American Pharmaceutical Association. A quality designation for chemicals similar to U.S.P.

NEAR POINT — 1) The nearest object to a camera which is still acceptably sharp when the camera is focused for a given distance. 2) The point nearest the eye which can be sharply focused on the retina.

NEGATIVE FILM — Film used primarily for the making of original photographic records. Processing negative film produces a negative image which through the process of printing or enlarging produces the positive. Such films are usually characterized by higher speed than positive films.

NEGATIVE IMAGE — A photographic image in which the values of light and shade of the original subject are inverted. In a negative, light objects are represented by high densities and dark objects are represented by low densities. In color negatives, not only are densities inverted, but the colors are represented by their complementary colors.

NEGATIVE LENS — A diverging lens; that is, a lens which is thinner at the center than at the edge, and which can form only a virtual image of the subject.

NEGATIVE PAPER — Ordinary printing and enlarging paper is negative, but negative paper usually refers to a special paper used by photoengravers in photo-offset work. The paper is placed inside the camera for exposure and is usually called a paper negative.

NEGATIVE SIZE — The outside dimensions of the negative made by a camera (such as 2-1/4 x 2-1/4 inches).

NEUTRAL — (1) Without color; gray. (2) Neither acid nor alkaline; usually applied to solutions.

NEUTRAL DENSITY FILTER — A filter which absorbs all colors equally, thus reducing the intensity of the light transmitted without changing its chromaticity. Used to reduce the exposure when a lens cannot be stopped down sufficiently.

NEW COCCINE — A red, water-soluble dye, having an affinity for gelatin. Used in low concentrations for local exposure control in printing from thin negatives.

NEWTON'S RINGS — Irregular light and dark rings seen when two optically smooth surfaces are in near contact, caused by the interference of the light rays reflected from the upper surface with those reflected from the lower surface. The light ray reflected from the lower surface travels further than the one reflected from the upper surface. If the extra distance traveled is a whole number of wavelengths, the interference is constructive and the observer sees light. If the extra distance traveled is 1/2 of a wavelength further than a whole number of wavelengths, the interference is destructive and the observer sees no light. Variations in the separation of the polished surface of the order 1/2 wavelength cause fringes to appear, which often take the form of rings. The same effect occurs with transmitted light.

N.F. — See *NATIONAL FORMULARY.*

NIGHT FILTER — A filter devised to produce night effects in daylight on black and white film.

NITRATE BASE — A film base comprised largely of cellulose nitrate. It burns violently, emitting large quantities of toxic nitrogen oxide gases, degrades with age and may ignite spontaneously. Cellulose nitrate was used as a film base for professional movie film in the United States as late as 1951 and is still occasionally encountered in old films.

NITROGEN BURST — A method of agitation in which nitrogen gas is released under the surface of photographic chemical solutions to agitate the solutions.

NODAL PLANES — Two planes, perpendicular to the optical axis of a thick lens, which contain the nodal points.

NODAL POINTS — Two unique points on the optical axis of a thick lens or a multi-element lens. A ray of light entering the lens at an angle to the optical axis, directed toward the first nodal point, will leave the lens from the second nodal point, parallel to its original direction. The nodal points of a photographic lens are located on each side of the center of the lens, and coincide with the principal points. The focal length of a thick lens is measured from the principal (nodal) point, rather than from the center of the lens, which is the point from which the focal length of a thin lens is measured.

NONACTINIC LIGHT — Light of wavelengths which do not affect the particular sensitized material involved within a reasonable length of time.

NON-COLOR-SENSITIZED — A photographic emulsion sensitive only to blue, violet and near ultraviolet light. Same as color blind.

NONCURL BACKING LAYER — A layer, usually made of gelatin, applied to the side opposite the emulsion layer of a photographic film or paper to reduce curl.

NONSILVER PROCESSES — The techniques and processes involved in producing images which do not use silver halides.

NORMAL — (1) A line perpendicular to a surface or to another line. It is used as a basis for determining angles of incidence, reflection, and refraction. (2) An average or standard value of a characteristic, used for reference.

NORMAL COLOR VISION — The ability to distinguish all hues in the range of variation of most human sight.

NORMAL CONTRAST — The contrast of sen-

sitized material, correctly exposed and processed to produce a finished image utilizing the full tonal scale of the chosen material.

NORMAL INCIDENCE — Incident at 90 degrees to the surface, i.e., perpendicular incidence.

NORMAL OBSERVER — The CIE normal observer is a series of three curves that define the average spectral response of the normal human eye to three imaginary primary colors and form the basis for the CIE system of colorimetry.

NOTCH — A shallow depression cut in the edge of a piece of film, used to mark a particular frame, to cue a change or automatic operation, or to identify the emulsion. See also *NOTCHING CODE.*

NOTCHING CODE — One or more notches of characteristic shape, placed by the manufacturer in one edge of a sheet of photographic film to identify the emulsion side and the emulsion type. Normally placed in the upper right hand corner, when facing the emulsion.

NUMERICAL APERTURE (N.A.) — The sine of half the angular aperture, used as a measure of the effective aperture of a microscope objective.

OBJECT — The figure viewed through or imaged by an optical system.

OBJECT DISTANCE — The distance of an object from the eye or from an optical system. Usually measured from the front nodal point of a lens.

OBJECTIVE — The optical component which receives light from the object and forms the first or primary image. In cameras, the image formed by the objective is the final image. In telescopes and microscopes, when used visually, the image formed by the objective is magnified by means of an eyepiece.

OBJECTIVE APERTURE — That part of the objective which can pass light. Since this area is usually circular in shape, its size may be indicated by its diameter.

OBJECT PLANE — That plane normal to the optical axis of a lens that contains the object.

OPACITY — The light-stopping power of the silver deposit in a negative. It is usually measured as optical density.

OPAL GLASS — A highly diffusing translucent glass having a nearly white or light gray appearance. Flashed opal glass is a thin layer of opal glass on one or both surfaces of clear glass. Used as a diffusing medium in enlargers and other devices.

OPAQUE — 1) Not capable of transmitting light. 2) A red or black pigment used to block out portions of a negative.

OPAQUE — (1) Not capable of transmitting light, (2) A red or black pigment used to block out portions of a negative.

OPEN FLASH — A flash technique in which the camera shutter is opened manually before the flash and then closed.

OPTICAL AXIS — An imaginary line passing through the centers of curvature of all the lens elements in a compound lens.

OPTICAL BRIGHTENING AGENTS — Chemicals which fluoresce in visible or ultraviolet light to give the appearance of increased brightness. They can be incorporated into the paper base, emulsion, or both, or into the paper processing solution.

OPTICAL CEMENT — A transparent adhesive used to bond optical elements to each other or to holding devices. Canada balsam is the classic optical cement, although it is being replaced by modern synthetics, such as methacrylates, caprinates, and epoxies.

OPTICAL CENTER — For a thin lens, that point through which a ray of light passes without deviation. This point is situated on the optic axis and is the geometrical center of a thin lens.

OPTICAL CONTACT — A condition in which two clean surfaces are fitted so closely as to merge optically. If the two media are the same, there is no reflection from the surfaces in contact. If the two media have different indices of refraction, the surfaces reflect as a single surface.

OPTICAL DENSITY — See *DENSITY, OPTICAL.*

OPTICAL FLAT — A thick plate of glass or fused quartz with one highly polished, optically flat surface.

OPTICAL GLASS — A glass which is carefully controlled during manufacture with respect to its composition, melting, heat treatment, and other processing, in order that it be optically homogeneous, have maximum transmission of light, and that its optical

characteristics have the values required for the application for which it is to be used.

OPTICALLY FLAT — A plane surface that has been ground and polished flat to within a fraction of a wavelength of light.

OPTICAL PRINTER — Any printer in which an image-forming optical system lies between the film bearing the image to be printed and the film receiving the image to be printed.

OPTICAL SOUND TRACK — A narrow stripe on movie film in which the sound information is present as variations in optical density.

OPTICAL SYSTEM — All the optical elements designed to contribute to the formation of an image.

OPTICAL TRANSFER FUNCTION — The fourier transform of the line spread function. A measure of the quality of an imaging system.

OPTIMUM EXPOSURE — An exposure of the correct irradiance and duration to produce a negative or positive reproduction of best quality.

ORIGINAL — The material which is to be reproduced.

ORTHOCHROMATIC FILM — A film which is sensitive to blue, green and some of the yellow, but not to red.

OSCILLOSCOPE CAMERA — A still or motion picture camera designed or modified to photograph the image on cathode ray oscilloscope screens. The camera may be equipped to record supplementary data on the same frame as the image.

OUNCE (oz.) — A unit of mass in the avoirdupois system, equal to approximately 28.3 grams.

OVERCOATING — A thin layer of material applied over the emulsion surface of a film to act as a filter or to protect the emulsion from abrasion.

OVERDEVELOPMENT — The result of permitting film or paper to remain in the developer too long, or having the developer too hot, resulting in excessive contrast, density, or grain.

OVEREXPOSURE — The result of too much light being permitted to act on film, caused by either too large a lens aperture, too slow a shutter speed, or both.

OVERHEAD CAMERA — A type of process camera construction used for very large equipment, in which the copy board and lens board are suspended from an overhead track for movement.

OVERHEAD (OVERHEAD PROJECTION) — A projection device for large transparencies.

OXIDATION — The loss of activity of a developer due to contact with the air.

OYSTER SHELLING — Concentric semicircles on the surface of a glossy print that has been improperly ferrotyped.

OZALID (Trade name) — See *DIAZOTYPE.*

PACIFIER (Slang) — A mixture of water and glycerin used to avoid curling of prints.

PAN — (1) An abbreviation for panchromatic. (2) In motion pictures, to move the camera in a horizontal plane while photographing a scene.

PANCHROMATIC — Black and white film sensitive to all visible colors of light.

PANORAMA — A photograph of a large group or a wide expanse of terrain. May be made with a special rotating camera.

PANORAMIC CAMERA — A camera designed to take a partial or complete panorama of the terrain. In some, the camera rotates as the film advances so that the image and the film are moved together at the same speed.

PANORAMIC HEAD — A revolving tripod head, so graduated that successive photographs may be taken which can be joined into one long panoramic print.

PAPER — A support material containing a sensitized emulsion coating and used in the reproduction processes to carry the final reproduced image.

PAPER NEGATIVE — See *NEGATIVE PAPER.*

PARALLAX — The apparent displacement of objects in a scene viewed from different points. Commonly encountered in photography as the difference between the image seen in the viewfinder and in the photograph.

PARALLAX ADJUSTMENT — Tilting a view

finder so that its field is the same as that of the camera for a given distance.

PARFOCALIZED LENSES — A group of lenses of different focal lengths, mounted so that as they are interchanged on the lens mount, the distance for which they are focused remains constant. A normal requirement for microscope objectives.

PASSE-PARTOUT — A method of framing a photograph by sealing it to a sheet of glass of the same size by means of gummed tape around the edges.

PASTEL — The color resulting from the addition of white to a pigment. Also known as tint.

PEAK LUMENS — The total luminous flux produced by a source at the instant of maximum intensity. Usually applied to the varying light output of a pulse source such as a photographic flash lamp.

PELLICLE — A thin film or membrane stretched optically flat and used as a beam splitter. It does not have the double reflection characteristic of a thicker glass plate.

PENCIL OF LIGHT — A very narrow bundle of light rays diverging from a point source or converging toward an image point.

PERFORATED FILM — Roll film having accurately located holes on one or both edges used to transport and position the film for successive exposures.

PERFORATION PITCH — The distance from the bottom edge of one perforation to the bottom edge of the next perforation, measured along the length of the film.

PERMANENT CURL — Curvature remaining in a film or print which has come to equilibrium.

PERSISTENCE OF VISION — The apparent retention of a short-lived image on the retina of the eye. Motion picture projection depends on this phenomenon.

PERSPECTIVE — The relative size and alignment of objects as recorded on a plane surface to produce the illusion of three dimensions.

PERSPECTIVE CENTER — A point to which all principal lines in the object appear to converge.

pH — The acidity or alkalinity of a solution, expressed in terms of the negative log of the hydrogen ion concentration. A neutral solution has a pH of 7.0; an acid solution has a lower pH; and an alkaline solution a higher one.

PHANTOM ILLUSTRATION — (1) A photographic reproduction in which minor details are depicted in an indistinct or ghostlike manner, sometimes by double exposure. (2) Masking in order to focus attention on the main subject or parts of the illustration.

PHOSPHOR — A material that has the property of absorbing electromagnetic energy from high energy photons or kinetic energy from electrons or ions and re-emitting the energy in the form of visible radiation. The wavelength of the emitted light is always longer than that of the absorbed radiation. See also *FLUORESCENCE* and *PHOSPHORESCENCE*.

PHOSPHORESCENCE — Luminescence which is caused by exposure to visible light or other forms of radiation and continues after the exposure has ceased.

PHOTOACTIVE — Susceptible to change upon exposure to light, such as a photographic emulsion, a photoelectric cell, or a photochemical.

PHOTOCHEMICAL ACTION — Chemical action induced by exposure to light.

PHOTOCONDUCTIVE — A material whose electrical resistance (conductivity) changes when exposed to light.

PHOTODRAWING — A combination of photographic and drawing details in a finished reproduction.

PHOTOELECTRIC CELL — A detector which produces an electrical signal upon exposure to light.

PHOTOELECTRIC COLORIMETER — A device which employs three or more combinations of source, filter and detector to measure the color of a sample in terms of its reflectance for lights representing three primary colors.

PHOTOELECTRIC DENSITOMETER — A photoelectric device for measuring optical density.

PHOTOENGRAVING — A method of producing etched printing plates by photographic means.

PHOTOFINISHING — The commercial processing of photographs on a highly automated basis.

PHOTOFLASH LAMP — A light bulb filled with fine metallic wire or foil in an atmosphere of oxygen. The heating of the filament ignites the primer which in turn fires the metal, giving a short brilliant flash of light.

PHOTOFLOOD LAMP — An electric lamp designed to be operated at higher than normal filament temperature, giving brilliant illumination at the expense of lamp life.

PHOTOFLOW — See *WETTING AGENT*.

PHOTOGENIC — (1) Having the characteristic of producing or emitting light (usually biologically). (2) Subjects which photograph well.

PHOTOGRAMMETRY — The production of maps based on aerial photographs.

PHOTOGRAPH — Any image recorded on photographic sensitized material.

PHOTOGRAPHIC BLEACH — A chemical compound used to remove the metallic silver image from a photograph.

PHOTOGRAPHIC EDGE — The boundary in a photograph between two sharply divided areas of different uniform densities.

PHOTOGRAPHIC EMULSION — A suspension of a light-sensitive silver salt, such as silver chloride or silver bromide, in a colloidal medium, usually gelatin, used for coating photographic film, plates, or papers.

PHOTOGRAPHIC FILM — A flexible, usually transparent material, the surface of which is coated with a sensitized photographic emulsion.

PHOTOGRAPHIC GRADE CHEMICALS — Chemicals whose purity makes them suitable for use in photographic processing; specifically, chemicals which meet the relevant requirements of the American National Standards Institute.

PHOTOGRAPHIC PAPER — A paper base, one side of which is coated with a sensitized photographic emulsion.

PHOTOGRAPHIC PRINTING — The production of a positive print from a negative or positive transparency.

PHOTOGRAPHIC SENSITOMETER — An instrument with which a photographic film is given a graduated series of exposures to light of controlled quality, intensity, and duration. The film is then processed and its density is measured and plotted as a function of exposure to produce the characteristic curve of the emulsion for the specific process used to develop it.

PHOTOGRAPHIC TONER — A chemical solution used to impart a color or tint to a photographic print.

PHOTOGRAPHIC WEDGE — A variable density wedge made on a photographic film or plate and used to vary the amount of light transmitted as a function of position along the wedge. It has a continuously varying density, in contrast to the step-wedge or gray scale.

PHOTOGRAPHY — The art and science of producing images on sensitized material through the action of radiant energy.

PHOTOMACROGRAPHY — Enlarged photography of small objects by the use of a long-bellows camera and a lens of short focal length.

PHOTOMETER — An instrument or device for measuring luminance. When used with suitable attachments, it can also be used for measuring luminous intensity or illumination. When combined with a suitable calculator, it can be used as an exposure meter.

PHOTOMETRIC FILTER — A light filter which is used to raise or lower the color temperature of a light source. There are two principal types: (1) bluish photometric filters, used to raise color temperature; and (2) yellowish photometric filters, used to lower color temperature. See also *MIRED FILTER*.

PHOTOMETRY — The science of measuring light in terms of its visual effect. If total energy is measured, radiometry is the correct term.

PHOTOMICROGRAPHY — Photography through a microscope.

PHOTOMONTAGE — See *MONTAGE* and *COLLAGE*.

PHOTOMURALS — Greatly enlarged photographs used as wall coverings.

PHOTOPIC ADAPTATION (OR VISION) —

Adaptation of the human eye to high levels of illumination, above ten lux. See also *SCOTOPIC VISION and ADAPTATION.*

PHOTOREGRESSION — The gradual disappearance of the latent image which occurs between exposure and development.

PHOTOSENSITIVE — Material which is chemically or physically changed by the action of light.

PHOTOSTAT — A former trademark, now the generic name for a photographic method for producing copies of documents, drawings, etc.

PHOTOTHEODOLITE — A photographic instrument used to measure angles in surveying, meteorology, missile tracking, etc.

PHOTOTUBE — A photocell in which light falling on an electrode causes it to emit electrons, which are drawn to a second electrode by a potential difference, resulting in a photocurrent.

PHOTOVOLTAIC — Producing a voltage when subjected to incident light. A properly filtered photovoltaic cell, when calibrated, can be used to measure illumination levels.

PINCUSHION DISTORTION — A type of lens distortion in which straight lines near the edge of the image are bowed inward toward the lens axis. The opposite of barrel distortion. Also called positive distortion.

PINHOLE CAMERA — A camera using a tiny aperture or pinhole in place of a lens.

PINHOLES — Clear spots on negatives or prints caused by dust, air bells, or undissolved chemicals.

PITCH — See *PERFORATION PITCH.*

PLANE OF BEST DEFINITION — That plane in the image space which produces the most sharply defined pictures under a given condition. This is usually the image plane, but this term is used when a distinction is to be made.

PLANO-CONCAVE LENS — A lens which has one side flat and is thicker at the edge than at the center.

PLATE — (1) A rectangular sheet of glass with a light sensitive emulsion coating. (2) Photomechanical reproduction of a photograph on a metal sheet so that it can be further reproduced by means of a printing press.

PLATE BACK — An attachment to roll film cameras which permits the use of plates or sheet film.

PLATE HOLDER — A lightproof holder in which sensitized plates are held for exposure in a camera.

PLATEN — (1) A piece of glass or metal at the focal plane against which film is pressed to keep it flat during exposure. (2) A pressure plate.

PLUS — A term used to denote a converging or positive lens, derived from the focal length, in diopters, of such a lens, which is a positive number.

POINT LIGHT SOURCE — Ideally, a light source with zero dimensions. Practically, a light source whose maximum dimension is very small compared to the distance from which it is viewed.

POLARIZED LIGHT — Light whose vibration is limited to a single plane.

POLARIZING FILTER — A filter that transmits only the component of the incident light which is parallel to its plane of polarization. The plane of polarization of the filter can be rotated to vary the amount of polarized light, such as skylight or light specularly reflected from shiny objects, relative to the unpolarized light diffusely reflected from other parts of the scene which is viewed.

POLYESTER FILM — A type of plastic with high strength and dimensional stability used as a base for films requiring high accuracy, such as mapping (trade names: Estar, Mylar).

PORTRAIT — A photograph of a person done in a stylized manner.

PORTRAIT ATTACHMENT — A supplementary, positive lens which decreases the focal length of a camera lens, thus permitting focus at decreased object distances.

PORTRAIT LENS — A lens of relatively long focal length, often with some degree of image diffusion, specifically designed for making portraits.

POSITIVE — An image in which the tones correspond to those of the original, light objects being light

and dark objects being dark. Opposite of a negative.

POSITIVE REVERSAL PROCESS — The processing of an exposed photographic emulsion consisting of: (1) development, (2) bleaching out the resulting silver deposits, (3) re-exposure to light in order to activate the remaining silver halides, (4) development of the new latent image, (5) fixing. This produces a positive image on the film. Some film can be either positive or negative, depending on the processing.

POWER (OF A LENS) — The reciprocal of the focal length of a lens in meters, expressed in plus diopters for converging lenses and minus diopters for diverging lenses. A lens with a focal length of 10 mm (0.01 m) has a power of 100 diopters.

PRECIPITATE — A solid formed by the reaction of chemicals in solution. Developing is said to precipitate the silver from the silver halide.

PRECISION CAMERA — Any camera capable of giving dimensional and definition results of a high order of accuracy.

PRE-EXPOSURE — Exposure of a sensitized material to light either during manufacture or by the user before exposure in the camera.

PREFOCUSED — A lamp having a special type of base and socket which always aligns the filament in the same position with respect to an optical system.

PREHARDENER — A preprocessing bath used prior to development to permit processing at elevated temperatures without physical damage to the emulsion.

PRERINSE — A solution used prior to development to make sensitized material more receptive to the developing solution.

PRESERVATIVE — The ingredient in a developing solution which prevents its oxidation before use and rapid deterioration during use.

PRESS CAMERA — A large format camera, handheld, usually accepting 4x5 inch sensitized materials. It is equipped with a focusing scale, a rangefinder and a ground glass screen for focusing. It may have a between-the-lens shutter, a focal plane shutter, or both.

PRESSURE PLATE — A flat plate that presses the film into contact with the aperture plate of a camera, insuring that it is flat and in the focal plane during exposure.

PRIMARY COLORS — The three colors, red, green and blue, by mixture of which nearly all colors may be produced. Magenta, yellow, and cyan are the subtractive primaries. See also *SUBTRACTIVE PRIMARY COLORS.*

PRINCIPAL PLANES — In a thick lens, the two planes, perpendicular to the optical axis, which contain the principal points of the lens. The first principal plane is located on the object side of the lens; the second principal plane is located on the image side of the lens. See also *NODAL POINTS.*

PRINCIPAL POINTS — For thick lenses used in air, the same as the nodal points. The principal points do not correspond with the nodal points in oil-immersion systems as used in microscopes. See *NODAL POINTS.*

PRINT — (1) A positive image on opaque material, usually paper. (2) In motion picture work, a print is a positive transparency on motion picture film.

PRINTER — Equipment used for making photographic prints.

PRINTING — The making of positives from a negative. Prints may or may not be the same size as the negative.

PRINTING FRAME — A frame designed to hold a negative in contact with the photographic paper during printing.

PRINTING SPEED — An indication of the sensitivity of the emulsion of a printing material.

PRINT MOUNT — A stiff material to which a photographic print is cemented to keep it flat, to provide protection or enhance its appearance.

PRINT-OUT PAPER — A sensitized photographic printing paper which forms a visible image with exposure to light. It does not require chemical development.

PRINT ROLLER — A rubber roller with a handle used to assure proper contact of prints on a ferrotype plate.

PRINT STRAIGHTENER — A device to remove

the natural curl from emulsion coated papers, generally adding moisture to the emulsion to prevent cracking during the operation.

PROCESS CAMERA — A large camera and copying stand (copy board) used by photoengravers.

PROCESS FILM — A high contrast, sensitized film used in the graphic arts and for copying line or straight black and white originals with no middle tones.

PROCESSED FILM — Film which has been developed and fixed to produce a visible image which is stable and insensitive to light.

PROCESSING — The chemical treatment of exposed film to form a visible stable image.

PROCESSING LABORATORY — A workroom where photosensitive materials are processed and finished.

PROCESS LENS — A highly corrected lens used for graphic arts work and magnification copying.

PROCESS PHOTOGRAPHY — The techniques required for photochemical reproduction.

PROCESS PLATES — Printing plates used in graphic arts reproduction processes.

PROJECTED BACKGROUND — A moving background for motion pictures or television provided by projecting films of the desired scene, usually by back projection, on a large screen behind the actors who are being photographed.

PROJECTED FRAME VIEWFINDER — A viewfinder used on some cameras which optically places a bright line defining the field of the picture in the same plane as the object being photographed.

PROJECTION ANGLE — The angle between the optical axis of a projector and the horizontal axis.

PROJECTION DISTANCE — The distance from the front of the projector lens mount to the screen, measured along the optical axis.

PROJECTION LENS — A lens, usually without a variable aperture, used for projecting pictures.

PROJECTION PAPER — A fast photographic paper which is exposed by projection or enlargement from the negative to be printed.

PROJECTION PRINT — An enlarged or reduced photographic print made by projection of an image of the negative on the sensitized material.

PROJECTOR — (1) An optical device for casting the image of a transparency or a motion picture upon a screen. (2) An enlarger.

PROOF PAPER — A type of paper, usually of the printing-out variety, used to make proofs for approval.

PULL-DOWN — A mechanism for moving a series of film frames into place successively in the camera gate, or at the aperture of a printer or a projector.

PULSE CAMERA — A camera designed to operate a frame at a time in response to a command, such as an electrical pulse.

PUPIL — The opening or "window" of a lens through which light enters or leaves, called the entrance pupil and exit pupil, respectively. Actually, the image of the aperture.

QUARTZ HALOGEN LAMP — An incandescent light source containing a tungsten filament and a trace of iodine or bromine vapor in a quartz envelope. Bulb blackening, common to ordinary tungsten filament lamps, is virtually eliminated, assuring consistent intensity and spectral quality throughout the life of the lamp. The life of such a lamp is greater than that of an ordinary tungsten lamp used at the same output.

QUARTZ LENS — A lens made from optical fused quartz (vitreous silica), used for ultraviolet photography.

RACK — The toothed metal strip with which the focusing gear of a camera engages. It is sometimes also used to operate a rising front.

RACKOVER — A camera arrangement permitting a viewfinder to be moved into the position behind the lens normally occupied by the film.

RADIAN — A unit of measure of plane angles. One radian is $360/2\pi$ or about 57.3 degrees.

RADIOGRAPH — The preferred term for an X-ray picture.

RADIOMETER — (1) A device for the quantitative measurement of the energy or power in a beam of radiation. (2) An assembly of plates mounted on rotation vanes inside a partial vacuum; the plates are black on one side and shiny on the other and rotate when they are heated by radiation.

RADIOMETRY — The science of the measurement of the power of electromagnetic radiation, as distinct from its visual effect, for which the corresponding science is photometry.

RANGEFINDER — An optical device used to determine the lens-to-subject distance and hence the correct distance setting for focusing.

RATIO — Short for magnification ratio. The degree of enlargement or reduction of a photographic copy with respect to the original.

RAW STOCK — Film which has not been exposed or processed.

RAY TRACING — Calculation of the path of a light ray through an optical system, following the laws of geometric optics.

REAL IMAGE — (1) Any image formed by a lens or mirror which can be focused on a screen, plate, film or other surface. Such an image exists in space, as can be proved by blowing smoke across the image space or by placing a diffusing screen at the image. Real images are formed by converging light rays. See also *VIRTUAL IMAGE.*

REAR PROJECTION — The projection of a picture onto a translucent screen from the side opposite to that from which the picture is viewed.

RECIPROCITY FAILURE — All photographic materials fail to follow the reciprocity law at very low and very high light levels. The effect is particularly noticeable with color film where, in addition, the various colors follow the reciprocity law differently as the exposure time is varied, i.e., the slopes of the straight-line portions of their characteristic curves differ from each other. This produces a shift in the color balance.

RECIPROCITY LAW — A law that states that exposure is the product of irradiance and the time of exposure. All materials fail to follow the law at very low and very high light levels, i.e., when they are not on the straight-line portions of their characteristic curves.

RECYCLE TIME — (1) The minimum time between successive flashes of an electronic flash unit. (2) The minimum time between successive pictures in a sequence or pulse camera.

REDEVELOPMENT — A method of toning or intensification in which the image is first bleached and then treated with a solution which redevelops the image to a greater density or a different color.

RED EYE — A phenomenon in flash photography which causes a bright pink reflection to appear in the pupil of the subject's eye, due to the retroreflectance of the eye. It is eliminated by positioning the flash lamp away from the camera axis or increasing the ambient light.

REDUCE — (1) To make a print smaller than the original negative. For example, to make lantern slides from large negatives or to make a print on 16mm motion picture film from a 35mm negative. (2) To decrease the density or contrast of an overexposed or overdeveloped negative or print.

REDUCER — A solution used for decreasing the contrast or density in an overexposed or overdeveloped photograph.

REDUCING GLASS — A viewer that reduces the apparent size of the subject so that an approximate idea of its final printed quality can be obtained. It consists of a negative lens of large diameter.

REDUCTION/ENLARGEMENT RATIO — The linear ratio of the projected image to the printed image of the same object, or vice-versa, expressed in abbreviated form as 16X, 20X, etc.

REFLECTED LIGHT METER — (1) An exposure meter that measures the light reflected from an object. (2) A photometer.

REFLECTION — The redirection of a beam of light from a surface. Reflection can occur at a metal surface or at the interface between two transparent media of differing indices of refraction. In the latter case the incident ray usually divides into a reflected and a refracted ray. Reflection can be specular or diffuse, depending on the surface.

REFLECTOR FLOODLAMP — A floodlight bulb with a self-contained silvered surface which acts as a reflector.

REFLEX CAMERA — A camera containing a reflecting mirror, so positioned that the lens image can

be focused on a screen at the top of the camera.

REFLEX COPYING — A method of contact photocopying in which the exposing light first passes through the base of the sensitive paper and is reflected back to the emulsion by the material being copied.

REFRACTION — The bending (abrupt change of direction) of a ray of light in its passage at an oblique angle across an interface between optical media of different refractive indices.

REFRACTIVE INDEX — See *INDEX OF REFRACTION*.

REGISTER — To superimpose the three colored images making up a color print.

REGISTER MARKS — A set of cross-shaped marks placed just outside the photograph to be copied, in order to facilitate registering the three color images.

REGISTRATION PINS — Positioning pins set close to the gate of a motion picture camera, to engage the film sprocket holes and insure precise location of the film at the aperture.

RELATIVE APERTURE — The ratio between the diameter of the effective aperture of a lens and its focal length: the reciprocal of the f-number. The relative aperture is usually given in terms of the f-number rather than a fraction; e.g., a lens whose relative aperture is 1/4 (focal length is 4 times the diameter) is called an f/4 lens.

RELATIVE HUMIDITY — The ratio of the amount of water vapor present in a volume of air at a given temperature, to the greatest amount it could possibly contain at that temperature, expressed as a percentage.

RELIEF — The discernment of depth or apparent difference in distance that makes the object stand out from its background due to stereoscopic vision. The impression of relief can be obtained from the arrangement of highlights and shadows in a picture.

REPLENISHER — A modified developer solution which is added in small portions to a working developer to replace exhausted chemicals and thus keep its properties constant.

RESIDUAL HYPO — The sodium thiosulfate (hypo) remaining in film or paper after washing. Since residual hypo may cause fading, careful control must be maintained in processing to insure that permissible limits are not exceeded. See also *HYPO TEST*.

RESOLUTION CHART — A chart with vertical and horizontal lines inscribed at various spacings, used to test the resolving power of an optical system. See also *TEST CHART*.

RESOLVING POWER — A measure of the ability of a lens to form separate and distinct images of two objects close together.

RESTRAINER — The ingredient in a developer solution which prevents too rapid development and chemical fog; usually potassium bromide.

RETICLE — A scale, indicator, or pattern placed in one of the image planes of an optical instrument which appears to the observer to be superimposed upon the field of view. Reticles are used to determine the extent of a field of view, its center, for angular measurements within the field of view, etc.

RETICULATION — (1) The wrinkling of the emulsion surface of a film, due to sudden changes of temperature during processing. (2) The scale markings of a reticle.

RETINA — The part of the eye containing the light sensitive cells (called rods and cones). This is where the lens of the eye causes the image to be formed.

RETOUCHING — The alteration of a developed negative by means of a pencil, an abrasive, opaque, etc.

REVERSAL PROCESS — See *POSITIVE REVERSAL PROCESS*.

REVERSING MIRROR — A mirror used on process lenses instead of a prism for lateral reversal of camera images.

REVERTED IMAGE — An image, the right side of which appears to be the left side, and vice versa; mirror image.

REVOLVING BACK — A camera back equipped with a turntable so that it need not be removed when shifting from a vertical to a horizontal position.

RHEOSTAT — A variable resistance, used to change the current in an electrical curcuit.

RINSE BATH — A water bath in which photographic materials may be treated by immersion or spraying to quickly dilute the solution which the photographic material carried upon entering.

RISING FRONT — A lens board which may be moved in a vertical direction.

SAFE EDGE — A mask used around negatives to provide a white border on prints.

SAFELIGHT — Darkroom illumination that will not affect sensitive materials when used at the proper intensity and distance. Information on the proper safelight is usually supplied with the photographic material.

SAFELIGHT FOG — That portion of the developed photographic density that results from exposure to safelight illumination.

SAFETY FILM — Film with a cellulose acetate base, so called because it burns very slowly.

SAFETY SHOT — A duplicate exposure made in case of damage to one negative in processing.

SAFETY SHUTTER — A shutter of metal or heat-absorbing glass which is automatically inserted between the lamp and the film whenever a motion picture projector stops, to avoid burning or blistering the film.

SATURATED SOLUTION — A solution in which the maximum possible quantity of a particular substance is dissolved, at the given temperature.

SATURATION — The degree of purity (chroma) of color, or freedom from dilution by black or white.

SCALE — (1) The entire range of tones of a photographic paper of film. (2) In linear magnification, the ratio of a linear dimension in a photograph to the corresponding dimension in the subject. (3) The markings on a reticle.

SCOTOPIC VISION — Human vision under conditions of very dim lighting (one lux or less), where the eye is dark adapted and where color perception is almost completely absent. See also *PHOTOPIC ADAPTATION*.

SCREEN BRIGHTNESS — The luminance of the projection screen measured with the projector running but without any film or slide in the gate.

SCREW MOUNT — A lens mount which is threaded to fit the front of the camera.

SCRIM — A diffusing medium placed in front of a lamp to reduce its intensity. See also *DIFFUSER*.

SEAMLESS — Extra wide paper used as photographic background. The maximum width is 107 inches, varying from 12 to 50 yards in length.

SEATING SURFACE — The surface of a lens mount which determines the distance the lens is held from the film plane. See also *FLANGE FOCAL DISTANCE*.

SECOND — 1) The basic unit of time. 2) A unit of angular measure, 1/60 of a minute, 1/3,600 of a degree.

SELF-CAPPING SHUTTER — A focal plane shutter in which the slit automatically closes while the curtain is being rewound, to avoid fogging the film.

SELF-TIMER — A device on a camera which permits the shutter to trip about ten seconds after it is released. (May also be a camera accessory.)

SEMI-MATTE — Intermediate in glossiness between matte and glossy.

SENSITIVITY — A measure of the exposure required to produce a satisfactory image under given conditions.

SENSITOMETER — An instrument which exposes a photographic film in a known manner so that its light-sensitive properties may be measured.

SENSITOMETRIC CURVE — See *CHARACTERISTIC CURVE*.

SENSITOMETRIC STRIP — A series of densities in definite steps, ranging from white to black, exposed and processed on a piece of film. Used for processing control.

SEPARATION NEGATIVES — A set of three negatives made through appropriate filters (red, green, and blue) so that each represents one of the primary colors used in color photography.

SEQUENCE CAMERA — A still camera designed to take a series of pictures in rapid succession.

SHARP CUT-OFF FILTER — A filter having a large change in transmission for a small change in wavelength.

SHARPNESS — The distinctness of objects in a photograph. This is related to the distinctness of the sharp edges in the picture and is measured as acutance.

SHEET FILM — An individual film loaded into a separate holder for exposure, usually on a heavier base than roll film and film packs.

SHELF LIFE — The period of time that sensitive material may be stored under normal conditions without significant deterioration.

SHOOT (Slang) — To make an exposure.

SHORT END — The film saved for future use after the exposed part of a roll of movie film is cut off for processing.

SHORT-STOP — An acid solution which is used to neutralize the developer remaining on the negative or print before it is transferred to the fixing bath.

SHOTS — Exposures, pictures.

SHOULDER — The portion of the high density end of the characteristic curve of a photographic emulsion where it departs from the straight-line portion.

SHUTTER — (1) On a camera, a mechanical device which controls the length of time light is allowed to strike the sensitized material. (2) A similar device on a movie projector.

SHUTTER CONTACT DURATION — In flash synchronized shutters, the time from the initial closing of the electrical contacts to their final opening.

SHUTTER EFFICIENCY — The ratio, expressed as a percent, of the time a shutter remains fully open to the total time it takes to go from start of opening to fully closed.

SHUTTER RELEASE — A device to actuate a camera shutter. It may be mechanical, electrical, or pneumatic in nature.

SHUTTER SPEED — The effective length of time a shutter remains open, allowing light to expose the sensitive film in a camera. It is equal to the total amount of light passed by the shutter during its operation divided by the amount of light passed per second when the shutter is fully open.

SHUTTLE — The oscillating tooth which pulls the film down one frame at a time in a motion picture camera or projector. Also called a claw.

SILICA GEL — A chemical used to absorb moisture, frequently used in packing cases or storage containers.

SILICON MONOXIDE — A protective overcoating used on front surface mirrors and coated lenses to protect the more delicate evaporated coatings from abrasion and other mechanical damage.

SILK — (Photographic paper) having a surface texture like finely woven silk.

SILVER HALIDE EMULSION — The light sensitive coating on film, paper and other bases consisting of a mixture of silver halide salts and other chemicals suspended in gelatin.

SILVER RECOVERY — The reclamation of silver from photographic fixing baths, plates and film by chemical, electrical or mechanical means.

SINGLE-FRAME DEVICE — A release or crank on a motion picture camera which permits exposing one frame at a time for animation, stop-motion work, etc.

SINGLE-FRAME IMAGE — (1) An image on 35mm perforated film used in still photography. (2) A film strip frame measuring 24 x 18mm (1 x 3/4 in.).

SINGLE LENS REFLEX CAMERA (SLR) — A camera equipped with a mirror with which it is possible to view the subject being photographed through the lens of the camera rather than through a separate viewfinder. The mirror retracts prior to exposure.

SINGLE SYSTEM — An arrangement for recording original picture and sound simultaneously on the same strip of film.

SINGLE WEIGHT PAPER (SW) — Photographic paper with an average thickness within the range of 0.150 to 0.211 mm (0.0059 to 0.0083 in.).

SKYLIGHT — (1) A large window, usually facing north, used as the principal light source in certain photographic studios. (2) Daylight which reaches the observer indirectly by scattering and reflection, usually from a cloudless sky, as opposed to direct sunlight.

SKY LINE — The horizon (or the terrain features which join the sky) in a picture.

SLAVE FLASH UNIT — An independent, additional light source whose flash is activated by a photoelectric cell triggered by the flash from the main or auxiliary source falling upon the cell.

SLIDE BACK — A camera back which allows the film holder to be moved to either of two positions with respect to the lens. This allows two separate pictures to be made on a single sheet of film.

SLIDE PROJECTOR — A device designed for projecting transparencies.

SLIPPAGE — Any relative movement which occurs between negative and print during exposure on continuous printing equipment; this results in loss of resolution and, in extreme cases, in fuzziness.

SLOPE GRADIENT — The slope of any chosen part of the characteristic curve. This is distinguished from gamma which refers to the slope of the straight line portion of the curve only.

SLOW EMULSION — A photosensitive material having moderate or low sensitivity to light, i.e., having an ASA rating of about 25. Fine grain materials generally have slow emulsions.

SLOW MOTION — (Motion pictures) taken at high speed and projected at normal speed, so as to reduce the apparent speed of objects in motion.

SLUDGE — A muddy precipitate which forms in photographic processing solutions and settles to the bottom of processing tanks or containers.

SNAPPY (Slang) — A photographic negative or print showing brilliant detail and a wide brightness range in the middle tones.

SOFT —(1) A print or negative of relatively low contrast. (2) A picture which is not sharply focused.

SOFT COAT — A soft antireflection coating applied to a lens. Because this coating is not durable, it is normally not used on outside lens surfaces.

SOFT DEVELOPER — A photographic developer which in general produces a low contrast image. Sometimes known as a soft working developer.

SOFT LIGHTING — Diffuse lighting which results in a flat scene in which the luminance differences between highlights and shadows are small.

SOLARIZATION — (1) The reversal of photographic image tones caused by extreme overexposure. (2) A process of partial reversal by deliberate fogging of the film during development.

SOLENOID — An electromagnet with a movable iron core, sometimes used to trip the shutter of a camera in synchronization with a photoflash bulb or for remote control purposes.

SOOT AND WHITEWASH (Slang) — A very contrasty print.

SOUND SPEED — The speed at which a sound motion picture must be run to properly reproduce the sound. This speed is at the rate of 24 frames per second. For 16mm film, this is 36 feet/min; for 35mm, it is 90 feet/min.

SOUND TRACK — The record of sound on a motion picture film, either optical or magnetic. There are two types of optical sound tracks. See also *VARIABLE DENSITY* and *VARIABLE AREA.*

SOUP (Slang) — Developer.

SPECIFIC GRAVITY — The ratio of the weight of a volume of a substance to the weight of an equal volume of pure water.

SPECTRAL — As a function of wavelength.

SPECTRAL DISTRIBUTION — The amount of a quantity, such as radiant flux, per unit wavelength interval, plotted as a function of wavelength.

SPECTRAL SENSITIVITY — The variation in the sensitivity or speed of a photographic emulsion as a function of the wavelength of the exposing light.

SPECULAR REFLECTION — Reflection from a glossy surface or mirror, where the angle of incidence equals the angle of reflection.

SPIDER — A junction box connected to a cable and having multiple electrical outlets.

SPINDLE — A shaft onto which a film reel or spool is mounted during the transport of film from one reel to another.

SPIRAL REEL — A holder for film during development that generally consists of flanges with

spiral grooves on their inside surfaces into which (and along which) the film slides. These flanges are mounted on a hub so that the distance between the flanges may be adjusted to accommodate films of different widths.

SPLICE — A joint made by cementing, taping or welding two pieces of film or paper together so they will function as a single piece when passing through a camera, processing machine, projector or other apparatus.

SPLIT FIELD — The focusing field of a type of rangefinder in which the field is seen as two halves separated by a halving line. When the two halves align to form a single image, the rangefinder is in focus.

SPOOL — A flanged reel on which film is wound for insertion into a camera.

SPOT EXPOSURE METER — A reflected light exposure meter capable of measuring the luminance of a small field, usually 3 degrees or less.

SPOT LAMP (SPOT LIGHT) — A type of electric lamp producing a narrow, concentrated beam of light.

SPOTTING — The removal of small blemishes in photographic negatives or prints.

SPRAY PROCESSING — A technique for processing sensitized materials in which solutions are sprayed on the material from jet orifices to provide maximum agitation and close control over the processing variables.

SPROCKET — A wheel with teeth that engages the perforations in a film to move the film through a camera, printer, processing machine or projector.

SQUEEGEE — A flexible rubber blade that is drawn over the surface of a wet film or paper to remove the surface liquid. Also used to press glossy prints into contact with a high gloss or other surface for drying. Rollers are used for the same purpose. On continuous processing machines, an air squeegee may be used to remove surface liquid by blowing air against the material being processed.

STABILITY — The degree to which negatives or prints resist change by the action of light, heat or atmospheric gases.

STABILIZATION — A quick photographic processing technique which produces, for temporary use, prints and negatives of reasonable durability and resistance to heat, light and moisture. A stabilization bath is substituted for the fixing bath and the undeveloped silver halide is not removed from the film or paper. Such stabilized images can be made permanent by subsequent conventional fixing and washing.

STAIN — A local or general discoloration of negatives or prints.

STANDARD WEIGHT PAPER — See *LIGHTWEIGHT PAPER.*

STATIC — Branching, tree-like marks produced on sensitive materials by discharges of static electricity during handling or winding under very dry atmospheric conditions.

STEP PRINTING — A method of contact printing in which the film being copied and the raw stock are advanced intermittently (frame by frame), being exposed to the printer light only when stationary.

STEP WEDGE — A gray scale. A series of tones in steps of regularly increasing known densities from white to black, on a film base or glass plate. Used for processing and printing control.

STERADIAN — A unit of solid angle. One steradian is defined as the solid angle, with its vertex at the center of a sphere, that subtends an area at the surface of the sphere equal to the radius squared. There are 4π steradians in a sphere.

STEREO — Abbreviation for the word stereoscopic, when referring to three-dimensional photography and projection.

STEREO CAMERA — A camera having two lenses or the equivalent, through which a pair of pictures making up a stereogram may be taken simultaneously.

STEREOGRAM — A picture, or a pair of pictures prepared for use with a stereoscope.

STEREOSCOPE — A device containing lenses, prisms or mirrors through which a stereogram is seen as a single three-dimensional picture.

STILL LIFE — A picture of inanimate objects.

STILLS — Photographs as distinguished from motion pictures.

STOCK — A photograph made and filed for future use. (Newspaper term.)

STOCK SOLUTION — A concentrated solution which is to be diluted with water for use.

STOP — (1) See *FULL STOP.* (2) See *f-STOP.* (3) The aperture or diaphragm.

STOP BATH — See *SHORT-STOP.*

STOP DOWN — To reduce the diaphragm stop of a photographic lens to promote greater sharpness and depth of field in the image, or to decrease the exposure at a given shutter speed. This is done by increasing the f-stop.

STRAIGHT LINE PORTION — In photographic sensitometry, the portion of the characteristic curve which is substantially straight. Along this portion of the curve, equal density increments are produced by equal increments of the log of the exposure. See also *GAMMA.*

STRESS MARKS — Dark streaks or lines on negatives caused by mechanical contact or friction.

STROBE (Slang) — See *STROBOSCOPE.*

STROBOSCOPE — A light source which produces a continuous series of flashes, each a few microseconds in duration, at a repetitious, controllable rate. It is used to study a rapidly moving part by adjusting the flashing rate close to the frequency of motion of the part, thereby slowing or stopping its apparent motion.

STROBOSCOPE EFFECT — The motion picture effect in which the apparent motion is different from the real motion, and may even appear to stop or reverse. This occurs when the frame rate of the camera is nearly equal to some repetition rate in the motion.

STUDIO — An establishment or working space in which photographs or motion pictures are made.

STUDIO CAMERA — A large-format camera used within a studio.

SUBJECT HOLDER — A device with a hinged glass cover which is used to hold documents flat and immobile during photographing.

SUB-MINIATURE CAMERA — A very small, still-picture camera which uses 16mm or smaller film.

SUBTRACTIVE PRIMARY COLORS — The colors (usually magenta, cyan, and yellow) used in three-color subtractive color processes.

SUBTRACTIVE PROCESS — A color photography process which uses the colors magenta, cyan and yellow, in contrast to the additive color process which uses red, green and blue. See also *MINUS COLOR.*

SUNSHADE — A hood placed over a lens to keep stray light from its surface.

SUPER 8 — An 8mm cine film format with a frame size of 5.79mm (0.228 in.) wide by 4.14mm (0.163 in.) high. Also known as 8mm Type S.

SUPERIMPOSED IMAGE RANGEFINDER — A rangefinder which displays two images in the same field, and which indicates focus on the object centered in the rangefinder when the images coincide. Often, one image has a slightly different color for ease in viewing.

SUPER SLIDE — A 50 by 50 mm (2 by 2 inch) slide with a 40 by 40mm transparency (about 1-5/8 by 1-5/8 inches), obtained with size 127 film, as opposed to the more usual 24 by 36mm size (about 1 by 1-1/2 inches) obtained with 35 mm film.

SUPPLEMENTARY LENS — An attachable lens by means of which the focal length of a camera lens may be increased or decreased. See also *PORTRAIT ATTACHMENT.*

SURFACE DEVELOPMENT — A characteristic of some fine grain developers, which tend to develop the image mainly on the surface of the emulsion.

SWING BACK — The back of a view camera which can be tilted on both horizontal and vertical pivots to control the perspective in the image.

SWING FRONT — A lens board on a view camera which can be tilted on both horizontal and vertical pivots to control the perspective in the image.

SYMMETRICAL LENS — A lens combination with identical front and rear elements.

SYNCHRO-FLASH — A flash arrangement in which the flash bulb ignites at the same time that the shutter is opened.

SYNCHRONIZED SHUTTER — A shutter arranged to operate one or more pairs of contacts to

complete an electrical circuit and to fire a photoflash device. Different types of flash units require different time delays. There are three types of synchronization which may exist separately or in combination in any given shutter (designated X, M, or F in accordance with the flash lamp designation). The difference lies in the time delay between the closure of the contacts and the time at which the shutter is fully open; 0 + 1 millisecond for type X, 13 to 17 milliseconds for type M, 2 to 5 milliseconds for type F.

SYNCHRONIZER — A device for synchronizing the shutter of a camera with a flashlamp so that the shutter is fully opened at the instant the lamp reaches its peak intensity.

TAKE — A motion picture recording of a scene.

TAKE-UP — That part of a camera or projector which winds up the film after it has passed through the mechanism.

TAKE-UP REEL — A reel onto which motion picture film is wound after exposure or projection.

TAKE-UP SPOOL — A spool onto which the film is wound after exposure in a still camera.

TAKING LENS — The lens which forms the image on the sensitized material, contrasted with the viewing lens in a twin-lens camera.

TANK — A chemically resistant container to hold processing solutions and film. Hangers, reels or racks are used to hold the material being processed.

TANK DEVELOPMENT TIME — The time required to develop a film in a tank as opposed to a tray. Materials developed in a tray will normally receive more agitation than those processed in a tank, and thus requires shorter processing times.

TANNING — A chemical process which hardens the gelatin in the photographic emulsion in proportion to the amount of silver image present. It is used primarily in bromoil, carbo and carbon, and dye imbition printing processes.

TANNING DEVELOPER — A processing bath containing a developing agent that hardens the gelatin in an emulsion in proportion to the amount of silver image that is developed.

TARGET — See *TEST CHART*.

TELEPHOTO LENS — A lens of long focal length having a separate negative rear element. It is used to form large images of distant objects.

TEMPERATURE COEFFICIENT OF DEVELOPMENT — A numerical indication of the change of developer activity with temperature.

TEMPERATURE CONTROL — A device or technique used to maintain the temperature processing solution within required limits.

TEST CHART — A chart for testing the performance of photographic lenses. The design usually consists of ruled lines or squares of various sizes so arranged that by examining the image of such a chart, the quality of the lens for various parts of the field may be determined. Also known as a *TARGET*. See also *RESOLUTION CHART*.

TEST STRIP — A sheet of sensitized material on which one or several graduated exposures are made to determine the correct exposing and/or processing time. Generally used in printing.

TEXTURE — The surface roughness or smoothness of a photographed object, often portrayed by using light from a direction almost parallel to the surface of the object.

THERMOGRAPHY — (1) A copying process based on the absorption of radiation by an image to form a corresponding heat pattern which, when conducted to a heat sensitive copy sheet, causes formation of a visible image. (2) A process allowing direct visualization of temperature differences in a subject.

THICK (Slang) — Dense or overexposed.

THICK LENS — A lens whose axial thickness is so large that the principal points and the optical center cannot be considered as coinciding at a single point on the axis.

THIN — Lacking detail in both highlights and shadows.

THIN LENS — A lens whose axial thickness is sufficiently small that the principal points, the optical center, and the vertices of the two surfaces can be considered as coinciding at the same axial point.

THIN PAPER — Photographic paper with an average thickness within the range of 0.094 to 0.109 mm (0.0037 to 0.0043 in).

THREADING — Loading film or leader into a photographic device from the supply spool around all idlers, rollers, sprockets, etc., to the take-up reel.

THREE COLOR PHOTOGRAPHY — Any photographic process by which a color photograph is made from three independent records which correspond to three different color aspects of the original scene.

THRESHOLD — The smallest stimulus that can be detected in terms of photographic density.

THROW — The distance between the projector lens and the surface upon which an image is projected.

THUMB MARK — A mark or notch which enables a person to orient a slide or film in the dark without visual examination. A slide should be placed in a projector with the thumb mark on the upper, right hand corner.

TILT — (1) A view camera lens mount which permits rotation of the lens in the vertical plane. (2) A motion picture scene in which the camera rotates to sweep up or down in a vertical plane.

TIME EXPOSURE — A photographic exposure of relatively long duration. With most shutters, the shutter speed is set to "Time" and the exposure is made by two successive actions to open and close the shutter. This is contrasted to "Bulb," in which the shutter remains open as long as the trip lever is depressed.

TIME-GAMMA-TEMPERATURE CURVE — A curve of developing time at a given temperature plotted as a function of developed contrast (gamma). Similar curves made at a number of temperatures constitute the complete time gamma series. The contrast for any given time and temperature may be read directly from the curve or vice versa. The curve applies only for the given developer and emulsion.

TIME-LAPSE PHOTOGRAPHY — Motion picture photography in which a large lapse of time takes place between the exposure of successive frames. Used to secure very rapid motion. For example, to show the growth of a flower in a few minutes.

TIME TEMPERATURE CHART — A table showing the optimum time of development for various photographic materials in a given developer at a number of temperatures.

TIME TEMPERATURE DEVELOPING — The systematic developing of identical sensitized materials at a specific time and temperature, usually that recommended by the manufacturer.

TIME TO PEAK — The time required for a flashlamp to reach its highest intensity after electrical contact has been made. Usually given in milliseconds (1 millisecond = 0.001 second).

TIMER — A special clock for use in darkrooms which gives audible or visible indication of various time intervals, generally in seconds and minutes only.

T-NUMBER, T-STOP — A system which rates lenses and lens apertures in accordance with their actual light transmission rather than by their geometry, as in the f-stop system. The T-number is equal to the f-number divided by the square root of the transmission.

TOE (OF THE CHARACTERISTIC CURVE) — The low density end of the characteristic curve, from the threshold to the start of the straight line portion.

TONE — 1) The degree of lightness or darkness in a processed print. 2) The color of the image in a black and white photographic print (warm, cold, sepia, etc.).

TONING — The process by which the color of the image in a developed print is altered from the normal black toward a brownish-black or brown (sepia toning), a reddish black (copper toning) or a blue-black (blue toning). The toning process generally involves a chemical alteration of the silver grains in the photograph, or replacement of the silver by another metal, usually iron, selenium, copper or gold.

TOOTH — (1) Surface receptivity of film to pencil or ink for retouching purposes. (2) A projection from a sprocket wheel.

TOP LIGHTING — The method of microfilming in which the document is lighted from above.

TRAILER — The blank film at the end of a reel which protects the last few feet of the picture.

TRANSLUCENCY — The extent to which sensitized material will permit the transmission of diffuse light.

TRANSLUCENT — Transmitting light diffusely, so that no image can be formed or viewed through the material.

TRANSMISSION — The passage of radiant energy by a material.

TRANSMITTANCE — The ratio of the light passed through an object to the light falling upon it.

TRANSMITTED LIGHT — Light which as passed through a material.

TRANSPARENCY — A photographic print on a clear base, especially adaptable for viewing by transmitted light.

TRANSPARENCY VIEWER — Viewer for looking at transparencies without using a projector. It may incorporate a means for magnifying the image.

TRANSPARENT — Permitting the passage of light without scattering, so that an image may be formed.

TRANSPARENTISED PAPER — Paper in which the voids between the fibers have been filled with a material having an index of refraction similar to that of cellulose, to increase its light transmission, and greatly reduce scattering.

TRAVEL GHOST — A defect of motion picture projection systems which results in a blurring effect seen on the screen and is evidenced by vertical tails or light streaks added to the projected images of the transparent areas. It is caused by a lack of synchronization between the projector shutter and the intermittent mechanism or the pull-down mechanism, due either to faulty adjustment or faulty design.

TRAY — A shallow dish used as a container for photographic solutions during processing.

TRAY DEVELOPMENT TIME — See *TANK DEVELOPMENT TIME.*

TRAY ROCKER — A device used to move a tray containing a solution, thus providing consistent agitation of the processing chemicals.

TRAY SIPHON — A device for washing prints which projects a stream of water into a tray and simultaneously siphons off an equal amount of hypo-laden water from the tray.

TRICHROMATIC — See *TRICOLOR.*

TRICOLOR — Containing three colors.

TRICOLOR CAMERAS — A camera that is designed to divide the light transmitted by the lens in such a manner as to produce three separate color images in different planes.

TRICOLOR FILTERS — The red, green and blue filters used for the exposure of separation negatives in three color photography.

TRIGGER CORD (Flashgun) — An electrical cable provided with the appropriate connectors for linking a synchronized shutter to a photoflash device.

TRIMMING BOARD — A device used for trimming prints, consisting of a board, a hinged blade, and a rule attached to the board at right angles to the blade.

TRIPLET — A lens comprised of three elements cemented together.

TRIPOD — A three-legged stand used to support a camera.

TRIPOD HEAD — The tripod fitting to which the camera is fastened, which permits horizontal and vertical movement of the camera.

TRIPOD SOCKET — A threaded opening in the base of a camera used to fasten the camera to a tripod head.

TROPICAL DEVELOPER — A developer which contains an antiswelling agent to avoid damage to the film during processing at high temperatures.

TROPICAL PACKING — Moisture-resistant containers for the packaging of film for use in humid climates.

TUNGSTEN — (1) A metallic element of extremely high melting point, used in incandescent lamps. (2) In photography, tungsten refers to artificial incandescent illumination as contrasted to daylight, or fluorescent illumination.

TUNGSTEN HALOGEN LAMP — See *QUARTZ HALOGEN LAMP.*

TUNGSTEN RATING (or TUNGSTEN SPEED) — The speed of the film when it is used with tungsten light to approximately 3150 K.

TURRET — A rotating device holding two or more lenses. It is used on motion picture cameras, enlargers, and some projectors. Stops are used to insure proper alignment of the lens and the film gate (or aperture).

TWIN LENS REFLEX CAMERA — A camera equipped with two lenses; one is used to view and focus on the subject, the other forms the image on the sensitized material.

TWO-BATH FIXATION — A processing procedure used for photographic prints intended as permanent records. After development, the prints are fixed in two successive baths of identical composition, the relatively fresh second bath ensuring more complete removal of the silver halides and reaction products.

ULTRAVIOLET — Radiation whose wavelengths are just shorter than the violet end of the visible spectrum, in the 280 to 400 nanometer region.

ULTRAVIOLET ABSORBING FILTER — A filter that blocks ultraviolet radiation, used for cutting haze in color photography. This avoids excessive blues in color photographs.

UNDERDEVELOPMENT — Insufficient development due to (1) too short a developing time, (2) use of a weakened developer, or (3) too low a developer temperature.

UNIPOD — A single-leg camera support.

UNIVERSAL FINDER — A finder which can be adjusted to show the field covered by various lenses.

VACUUM FRAME — A device which holds the negative and the print or plate material in close contact by means of a vacuum.

VARIABLE AREA — A type of motion picture sound track in which the density of the silver deposit is constant and the width of the track is varied to produce the modulation.

VARIABLE CONTRAST PAPER — A sensitized photographic paper coated with emulsions having contrast characteristics graded from soft to hard depending on the color of the exposing light, as modified by a series of filters supplied for that purpose.

VARIABLE DENSITY — A type of motion picture sound track in which the width of the track is constant and the density of the silver deposit is varied to produce the modulation.

VARIABLE FOCAL LENGTH LENS — A lens whose focal length can be continuously changed by varying the distance between elements. This enables the photographer to obtain long shots, medium shots and close-ups without changing the camera to subject distance. A variable focal length lens does not necessarily remain in focus as its focal length is changed, in contrast to a zoom lens. See also *ZOOM LENS*

VECTOGRAPH — A stereoscopic photograph composed of two superimposed images, slightly out of horizontal register, which polarize light in planes 90 degrees to each other. Viewed through polaroid spectacles whose respective lens axes are parallel to those of the vectograph images, a three-dimensional image is seen.

VEILING GLARE — Non-image-forming light that is scattered more or less uniformly over the entire image plane in a camera.

VERTEX — (1) In a plane angle, the point formed by the intersection of the two lines. (2) In a solid angle, the point of the cone of lines defining the angle. (3) The point formed by the intersection with the optic axis of the lens surface nearest the subject, if the subject is in the center of the field.

VIEW CAMERA — A camera with a ground glass viewing back for composing and focusing. Usually, the back and front are adjustable to various positions for special photographic work.

VIEWFINDER — A device showing the field of view of a camera lens.

VIEWING LENS — The lens on a twin lens reflex camera which is used to view the subject.

VIEWPOINT — The place from which a picture is taken or viewed.

VIGNETTING — Underexposure of the edges of a photograph caused by blocking of the marginal rays by a sunshade or lens mount, or by a lens with inadequate coverage for the film size. Vignetting may be produced intentionally (by dodging) for special effects, as in portraiture. This type of portrait, with no distinct boundary, is known as a vignette.

VIRTUAL IMAGE — An image which has no actual existence in space. It is the image seen in a mirror, through a lens of negative power, or through a positive lens when the object is closer to the lens than its focal length. See also *REAL IMAGE.*

VISCOUS PROCESSING — A processing technique which uses thickened (thixotropic) processing solutions which are spread over the film surface in a thin uniform layer.

VISUAL ACUITY — The human eye's ability to separate details in viewing an object.

VISUAL CONTRAST — The apparent difference between areas of different tonality (background and image areas) as seen by the eye.

VISUAL FIELD — That region of space that can be seen by a motionless eye.

VOLATILE — Having a high vapor pressure, so that it evaporates easily.

WARM-TONED — Having brownish or reddish-black tones.

WASH — A method of providing a color tint to a photograph by uniformly applying a dye over its surface.

WASH-OUT — A print lacking in highlight detail.

WATERPROOF — A photographic paper manufactured from a base material which resists the penetration of process solutions.

WATER SPOT — A defect on film negatives, caused by allowing water drops to remain while the film is drying.

WATT-SECOND — A unit of electrical energy equal to one joule or about 0.738 foot pound.

WAVELENGTH — The distance between successive peaks of the electrical or magnetic fields in an electromagnetic wave.

WEAK — (A negative which is) thin due to underexposure or underdevelopment.

WEDGE — See *STEP WEDGE*.

WETTING AGENT — A chemical added to water to reduce its surface tension. This improves its wetting characteristics and reduces the formation of water spots.

WHITES — The highlights of a print.

WHITE LIGHT — Light without apparent color. Sometimes taken to have the composition of normal noon sunlight. Sometimes considered to be light with a color temperature of 5000 K.

WIDE-ANGLE LENS — A lens of shorter focal length and larger angle of view than a normal lens. In general, a wide-angle lens has a angular field of view greater than 40 degrees.

WORKING DISTANCE — The distance from the object to the front vertex of the optical system.

WORK PRINT — The first positive print made from a motion picture negative for preliminary screening and editing purposes.

WORM'S-EYE VIEW — A photograph taken from a very low angle.

XENON — A gas used in some modern high intensity lamps and flash tubes.

XEROGRAPHY — A dry electromechanical photographic process which uses a charged photoconductive plate to record the image. In exposure, the plate loses its charge in proportion to the intensity of the light. The latent image formed is made visible by treatment with powders which adhere to the charged areas only. The image is transferred to a suitable support and forms a positive print.

X-RAY PHOTOGRAPH — An image produced by passing X-rays through an object and receiving the shadow upon X-ray sensitive photographic material. The preferred name is "radiograph."

X-RAYS — Electromagnetic waves with shorter wavelengths than light or ultraviolet rays. They can pass through many materials which are opaque to light rays.

X-TYPE SYNCHRONIZED SHUTTER — A internally synchronized shutter with a time delay of zero millisecond between the closing of the electrical contacts and the full opening of the shutter. It is designed for use with X-type flash lamps and electronic flash equipment. See also *SYNCHRONIZED SHUTTER*.

YELLOWING — Discoloration of the white areas of a print because of age and exposure to light.

ZOOM LENS — An optical system in which the focal length or magnification is changed by the axial movement of one or more lens components while maintaining focus on a given object. It gives the effect of moving the camera to or from the subject.

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