A GLOSSARY OF COLOR PHOTOGRAPHY*

*The following glossary which has been prepared by the Color Committee contains some two hundred terms used in connection with color photography. Although, for convenience, all the listed terms are arranged alphabetically, it is really made up of two groups of material. One group consists of technical terms useful in the art. This group is composed for the most part of terms for which satisfactory definitions are not easily found in the text-books and dictionaries of the fundamental sciences, or in the general glossary of the Society.** It is not, therefore, intended as a complete technical vocabulary of the subject. The other group (marked by italicized type) contains proprietary names of special processes and equipment. The Committee admits to some uncertainty in connection with this portion. Some processes that are here described may be of no lasting importance; possibly other processes which have been omitted should have been included. In the case of some of the proprietary processes, complete, accurate information is not available; in the case of others the nature of the marketed product is changing from time to time.*

Absorption Band (of a color filter)—A dark zone in a spectrum resulting from the failure of a color-filter to transmit light of wavelengths corresponding to the band.

Acid Dyes—Dyes in which the color resides in the negative ion (anion). Commonly, salts of colorless inorganic bases with colored or potentially colored organic acids.

Additive Mixture—See ADDITIVE SYNTHESIS.

Additive Process—A process for reproducing objects in natural colors by means of the principle of additive synthesis. Usually, black-and-white positives, printed from negatives taken through the primary color filters, are projected or viewed in register by means of light beams of the primary colors.

Additive Synthesis—The formation of a color by mixing light of two or more other colors. *Any* color may be formed by mixing light of three primary colors in the proper proportions. *Some* colors may be formed by mixing light of two other colors.

Agfacolor Process—A 16-mm. adaptation of the lenticulated film principle. (1932)

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Angström Unit—A unit of length generally used for specifying the wavelength of radiation, especially light and radiant energy of wavelengths shorter than light. Numerically equal to 0.0000001 mm. (10^{-7} mm.). The unit more frequently used in colorimetrics is the millimicron.

Aniline Dyes—A term broadly applied to synthetic dyes derived from aniline or other coal-tar products.

Artificial Daylight—Light (visible radiation) having the same (or nearly the same) spectral composition as direct solar radiation plus skylight—in practice produced by selectively absorbing some components of the light emitted by artificial sources.

Autochrome Process—A process for three-color additive photography, plates for which are made by Lumière. The plates carry an irregular mosaic screen of red, green, and blue-violet starch grains with a panchromatic emulsion over-coating. (1907)

Basic Dyes—Dyes in which the color resides in the positive ion (cation). Commonly, salts of colored organic bases with colorless acids.

Beam-Splitter—An optical system so arranged as to reflect or transmit two or more portions of a light-beam along different optical axes. Such a device is frequently used in the production of color-separation negatives.

Bichromated Gelatin—Gelatin sensitized to light by the incorporation of a soluble bichromate, usually ammonium or potassium bichromate.

Bipack—A unit consisting of two superposed films or plates sensitive to different portions of the spectrum, and intended to be exposed one through the other.

Biprism—A prism having a principal section which is a triangle with a very obtuse angle and two equal acute angles, sometimes used as a beam-splitter.

Black—Incapable of reflecting light.

Black Body—1. A body which when heated radiates ideally according to fundamental physical laws (*i. e.*, Wien radiation law) relating energy, frequency, and absolute temperature. The properties of incandescent tungsten or carbon approximate those of a black body. 2. A body which absorbs all light incident upon it.

Bleach—*v. t.* To remove the color by chemical means; in photo-

graphy to remove, by chemical action (usually oxidation), the silver of an image. An image thus treated may be restored by suitable means generally leaving the gelatin film toned and/or tanned. *n.* A chemical reagent used for bleaching.

Bleach-Out Process—A process for making color-prints from a color-transparency, by use of a support coated with a mixture of dyes, each of which is capable of being decolorized by exposure to light in a different portion of the spectrum.

Bleeding of Color—The diffusing of dye away from a dye-image; most noticeable where dark areas adjoin light areas in a picture.

Brewster Process—A subtractive two-color process utilizing a double-coated negative film. A colored negative is printed on double-coated positive film, and the final silver images are bleached and dyed. (1914)

Brightness—The light (luminous power) per unit area, per unit solid angle, emitted from a surface in a given direction; the candle-power per unit area.

Brilliance—The characteristic of a color that expresses the intensity of the sensation.

Busch Process—An additive two-color process. The negative is produced by running 35-mm. film horizontally through the camera. Twin lenses form a pair of images upon a single frame area; image pairs are superposed when projected. (About 1928)

Carbon Printing—A process for making prints in one or more colors by exposure of a bichromated and pigmented gelatin tissue to produce local insolubility of the gelatin, followed by the development of a relief image through the solvent action of warm water.

Carbon Transfer Process—A process in which a relief image, produced in carbon printing, is transferred to another support from the one upon which it was developed.

Chemical Toning—The process of converting the silver of a photographic image into a colored substance, or replacing it by a colored substance through the use of chemical reagents which are not dyes.

Chromatic Aberration—A defect of a lens resulting in a difference in focal length for light of different colors.

Chromaticity—The quality of colors that embraces hue and saturation but excludes brilliance.

Chromoscope—1. A viewing-device for obtaining superposed images of color separation positives. 2. A type of colorimeter using colors produced by the rotary dispersion of quartz as standards.

Ciné Color Process—A subtractive three-color process. Negatives are made with a beam-splitter camera using a single film and a bipack. Double-coated film is used for the red (dye tone) and blue (iron tone) images. The third (yellow) image is added to the film from a matrix by imbibition.

Colloidal Dyes—Dyes the particles of which are submicroscopic in size, but larger than molecules or ions.

Color—1. The general name for all sensations (other than those related to spacial distribution) arising from the activity of the eye and its attached nervous system. Examples of color are the sensations red, yellow, blue, black, white, gray, *etc.* 2. More loosely, as above but excluding the black, white, and gray sensations.

Color Analyzer—1. A colorimeter. 2. An instrument used to determine the relative brightness of light of different wavelengths reflected or transmitted by a substance or emitted by a source.

Color Balance—The adjustment of the intensities of printing or viewing colors (of a color picture) so as to reproduce properly the scale of grays.

Color Blindness—An ocular defect resulting in failure of the eye to distinguish between chromatic colors. In total color blindness all colors appear as grays; the more usual partial color blindness (dichromatism) is marked by inability to distinguish between certain pairs, as, for instance, red and green.

Color Contrast—See CONTRAST, COLOR.

Colorcraft Process—A two-color subtractive process of cinematography. The negative is made by a beam-splitter or by a bipack method; the positive is on double-coated film. Print images are dye toned with the aid of an iodide mordant. (About 1929)

Color Developer—A substance or mixture of substances capable of reducing silver halides with the simultaneous production

of an insoluble colored oxidation product in the regions of the silver deposit.

Color Filter—See FILTER.

Colorimeter—An instrument used for measuring color. The *monochromatic* colorimeter operates according to the principle that any color sensation may be matched by a pure spectral hue mixed with white, or by adding a pure spectral hue to the unknown color to produce white. The *trichromatic* colorimeter operates according to the principle that any color sensation may be matched by the addition in the proper proportion of three primary colors, *viz.*, red, green, and blue.

Colorimetric Purity (of a color)—The ratio of the luminosity of the dominant wavelength to the total luminosity of the color being measured.

Color Index—A publication of the Society of Dyers and Colorists (British), listing practically all dyestuffs in commercial use.

Color Match—The condition resulting when samples of light from two or more sources produce identical color sensations.

Color Mixture Curves—See COLOR SENSATION CURVES.

Color Negative—A negative record of the color values of the original object.

Color Photography—A process in which an attempt is made to reproduce objects in their natural colors by photographic means.

Color Positive—A positive photographic (print) record of color values.

Color Saturation—See SATURATION, COLOR.

Color Screen—1. A color filter. 2. A surface bearing a mosaic, either regular or irregular, of minute, juxtaposed, transparent elements of the primary colors; used in a screen-plate or screen-film process of color photography.

Color Sensation Curves (Excitation Curves)—Curves based upon the response of the normal human eye, showing the relative excitations of the three elementary sensations, according to the Young-Helmholtz theory of color vision.

Color Sensitivity, Photographic—The sensitivity of a photographic material to light of various portions of the spectrum.

Color Separation—The obtaining of separate photographic records of the relative intensities of the primary colors in a subject in such a manner that a photograph in natural colors can be produced therefrom.

Color Specification—A description of a color made in such a way that the color sensation may be duplicated. This may be done either with the aid of a color analyzer or by the use of certain visual color matching devices, such as colorimeters or color comparators.

Color Temperature (of a source)—The temperature (expressed on the absolute scale) at which a black body radiator will visually match the color of the source.

Color Transparency—A color photograph upon a glass or film support to be viewed or projected by transmitted light, as distinguished from a color photograph on paper or other opaque white support to be viewed by reflected light.

Color Tree—A graphical method for specifying color sensation. Brilliance, hue, and saturation are presented in three dimensions.

Color Triangle—A graphical method of specifying hue and saturation. The three primary colors are represented at the apexes of a triangle and white at its center.

Complementary After-Image—A sensation caused by ocular fatigue characterized by the persistence of an image of the color complementary to that of the original stimulus.

Complementary Colors—Two colors of light, which, when added together in proper proportions, produce the sensation of white or gray. Also, two colors of dye or pigment, which, when superposed in proper concentrations, produce a gray.

Cones—One of the two chief light-sensitive elements of the retina, frequently regarded as the seat of color vision. See RODS.

Continuous Spectrum—A spectrum, or section of a spectrum, in which radiations of all wavelengths are present; opposed to line spectra, or band spectra.

Contrast, Color—The ratio of the intensities of the sensations caused by two colors. Sometimes the logarithm of this ratio.

Daylight—Total radiation from the sky and sun. For standardization of spectral quality, measurements are made at noon. The quality of daylight matches approximately that of a black body at 6500 degrees Kelvin.

Density—The logarithm to the base 10 of opacity (for transparent materials). The logarithm of the reciprocal of the reflecting power (for reflecting materials).

Desensitization—Treatment of a photographic material, as with

a solution of a suitable dye, to reduce its sensitivity to subsequent light exposure without destroying the developability of a previous exposure.

Developed Color Images—Colored photographic images produced by direct development.

Dichroic—Pertaining to the property of certain crystals of showing different colors when viewed in different directions by transmitted light; or pertaining to the property of some solutions of varying color with layer thickness or concentration.

Dichromatism—See COLOR BLINDNESS.

Differential Hardening (of gelatin)—The production of an image in gelatin in a manner such that the hardness is proportional to the original silver density of the image; or, in other cases, to the amount of light which has fallen upon a specially treated gelatin coating.

Dominant Wavelength—In a system of monochromatic colorimetry the wavelength, the hue of which matches the hue of the color being measured.

Double-Coated Film—Film having a sensitive emulsion on both sides of the base, the emulsions or the base often being impregnated with a dye which prevents the penetration of actinic light to the opposite emulsion when exposing either one of them.

Double-Image Prism—A prism so designed that with a lens it will form two images of an object; a beam-splitter.

Dufaycolor Process—A regular mosaic screen-plate process for three-color additive cinematography. (1931)

Dufay Process—A regular mosaic screen-plate process using four constituent colors. (1908)

Dupack Process—A process using a combination of a green-sensitive and panchromatic film sold by du Pont for making two-color motion picture negatives. The green-sensitive film bears a red filter layer upon its emulsion surface. The two films are run through the camera with their emulsion sides in contact. Exposure is made through the base of the green-sensitive film. (About 1931)

Duplex Color-Plates—Similar to the Paget screen-plate. The regular mosaic screen and the sensitive emulsion are on separate plates. (About 1927)

Dye Density—1. The logarithm to the base 10 of the visual opacity

of an area in a finished dye image. 2. The density of a single component of a two- or three-color print as measured by light of the complementary color.

Dye Mordanting—Broadly, the process of fixing a dye to a substance for which it has no affinity by means of a second substance which has an affinity both for the dye and for the first substance. More especially, in color photography, the treatment of a silver image so as to replace it in whole or in part with a substance having an affinity for dyes.

Dye Toning—The process of affixing a dye to a silver image or of replacing a silver image by a dye image through the action of mordants.

Effective Wavelength—See DOMINANT WAVELENGTH.

Elementary Colors—See PRIMARY COLORS.

Elements (of a screen-plate or lenticular color-film)—The individual filter particles of a color-screen, or the minute lenses of a lenticular film.

Embossing—*v. t.* The process of impressing minute lens elements upon a film base to produce a lenticular color-film. *n.* The lens elements collectively.

Equality of Brightness (of colors)—The state in which two colors have equal visual luminosity.

Etch—To dissolve portions of a surface not protected by a resist, as in making a halftone plate on copper or zinc; also to remove differentially hardened gelatin from an image.

Excitation Curves—See COLOR SENSATION CURVES.

Farbstoff-Tabellen (Lehmann and Schultz)—A listing of commercial dyestuffs similar to that of the Color Index.

Filter—A light-transmitting material (or liquid solution in a cell) characterized by its selective absorption of light of certain wavelengths. A so-called "neutral gray" filter absorbs light of all wavelengths to which the eye is sensitive to approximately the same extent and so appears without hue.

Filter Cut—The wavelength or spectral region at which the absorption of the filter varies rapidly with changing wavelength.

Filter Factor (Filter Ratio)—The ratio of the exposure required to produce a given photographic effect when a filter is used to that required without the filter. Many considerations, such as color-sensitivity of the emulsion, quality of radiation, and time of development influence the filter factor.

Filter Overlap—The spectral region in which two or more filters transmit light effectively.

Filter Ratio—See FILTER FACTOR.

Finlaychrome—See *Finlay Process.*

Finlay Process—A regular mosaic screen-plate process of color photography utilizing either a screen separate from a panchromatic plate (1929) or coated upon the same plate. The latter type is known under the trade-marked name, "Finlaychrome." (1931)

Flicker Photometer—An instrument in which two colors are presented alternately to the eye. Above a certain minimum frequency, equally brilliant colors show no flicker such as is shown by colors of different brilliance.

Fraunhofer Lines—Definitely located absorbed lines in the solar spectrum. Certain of the lines are named by letter, their positions being used as references of position in the spectrum.

Fringe—A defect in a color picture resulting from lack of registration of the component images. A fringe may be caused by parallax, error in printing registration, or by movement in the object which has taken place between the exposure of color-separation negatives.

Fundamental Colors—See PRIMARY COLORS.

Gaspar Process—A three-color subtractive motion picture process. Prints are made on film coated with three emulsion layers sensitized to three different spectral regions. In each emulsion is incorporated a dye which is destroyed in a bleach bath to a degree controlled by the silver image density. (1934)

Gaumont Tri-Color Additive Process—An additive method of three-color cinematography using a triple lens system both in the camera and in the projector. The frames are of standard (silent) width and three-fourths the standard height. (1912)

Gelatin Filter—A filter in which gelatin is used as the vehicle for the absorbing material.

Gray Filter—See FILTER.

Gray Key Image—An image of neutral color occasionally printed in register with the images in tri-color inks or dyes. In the imbibition process, the gray key image is sometimes developed on the printing material by the ordinary photographic method.

Half Silvered Mirror—See MIRROR, SEMI-TRANSPARENT.

Handschiegel Process—A process of applying color to local areas

of black-and-white prints by imbibition, using one or more dyed matrices.

Harriscolor Process—A two-color subtractive process of cinematography. Prints from color-separation negatives are made on single-coated film printed first through the back, processed, and blue-toned with iron. The residual emulsion on the front is subsequently printed, processed, and red-toned. (1929)

Herault Trichrome Process—An additive three-color process for cinematography. The three-color print, consisting of successive red, green, and blue dye-tinted frames, is projected 24 frames per second in a non-intermittent projector. (About 1929)

Heterochromatic Photometry—The comparison of the intensity of light of different colors.

Horst Process—An additive three-color process in which the three images are exposed and later printed within one standard frame. (About 1929)

Hue—That attribute of certain colors in respect of which they differ characteristically from the gray of the same brilliance, and which permits them to be classed as reddish, yellowish, greenish, or bluish.

Hue Sensibility—The sensibility of the eye to differences of hue.

Hypersensitization—The treatment of an unexposed photographic material by immersion in a solution, such as ammonia, to increase its sensitivity, principally to longer wavelengths.

Imbibition—A process for producing a dye-image by mechanical printing. A dyed relief or differentially tanned matrix of some substance such as gelatin is brought into intimate contact with a moist absorbing layer such as gelatin, the dye diffusing from the matrix to the absorbing layer.

Imbibition Matrix—A coating of gelatin or other colloid upon a support having an image capable of being dyed with water-soluble dye. See IMBIBITION.

Interference Colors—Colors resulting from the destruction of the light of certain wavelengths, and the augmentation of the light of others in a composite beam by interference. Colors of thin films and polarization colors of doubly refracting crystals in the polariscope are examples of interference colors.

Isopaque Curve—A line connecting a series of points of equal opacity. Such curves when applied to spectrograms may be

used to demonstrate the color-sensitivity of photographic materials.

Joly Color Screen—A regular mosaic screen-plate consisting of ruled lines. (1894–5)

Keller-Dorian-Berthon Process—See *Keller-Dorian Process.*

Keller-Dorian Process—A three-color additive motion picture process. A banded tricolor filter is associated with the camera lens. The film support which faces the lens is embossed with small lens elements. Each lenticular element images the filter bands upon the emulsion surface. A filter of similar form is associated with the projection lens. (Pat. 1908–9; introduced 1925)

Kinemacolor Process—A two-color additive process involving the use of a rotary shutter of color-filters before the lenses of both camera and projector. (1906)

Kodachrome Process—A two-color subtractive process for still photography and 35-mm. motion pictures, devised by the Eastman Kodak Company. Prints are made upon double-coated film; the positive is bleached with a tanning bleach and dyed with dyes which penetrate soft gelatin preferentially. (1915)

Kodacolor Process—A 16-mm. adaptation of the Keller-Dorian process. (1928)

Kromogram—Three transparent stereoscopic pairs of images which appear as a single color picture when viewed in a special viewing device called the "Kromskop." (1894)

Kromskop—A special form of the chromoscope invented by F. E. Ives, utilizing two semi-transparent mirrors and suitable color-filters for exposing three images with one lens. Positives (Kromograms) printed from the images are viewed with a similar device. (1894)

Lake—A pigment formed by the combination of an organic dye with a metallic compound or another dye with which it forms an insoluble precipitate.

Lenticulation—Minute optical elements having the form of cylindrical or spherical lenses embossed into the support side of photographic film. They serve in the process of analysis and synthesis of images in an additive color process. See *Keller-Dorian Process.*

Leuco-Base—A white or slightly colored substance which, upon

oxidation, sometimes accompanied by reaction with an acid or base, yields a more highly colored dye.

Light—Radiant energy evaluated according to its capacity to produce visual sensation.

Light Restraining Dye—A dye used for impregnating a light-sensitive emulsion to prevent the deep penetration of light during exposure.

Light-Splitter—See BEAM-SPLITTER.

Lignose Process—An irregular mosaic three-color process applied to roll film and film pack. (1927)

Line-Screen Process—A color-screen process in which the screen is formed by a regular pattern of ruled lines.

Lippmann Process—A process of direct color photography based upon the interference of light. An exceedingly fine-grained panchromatic emulsion is exposed in intimate contact with a metallic (mercury) mirror. A standing-wave pattern is produced throughout the depth of the emulsion layer, the silver being reduced in the anti-nodal planes, thus forming a system of reflecting laminae. The plates are viewed by reflected light. (1891)

Magnachrome Process—A two-color additive process of color cinematography. Half the normal picture height is used for each of the pairs of pictures.

Magnacolor Process—A two-color subtractive process for cinematography. Bipack negative and double-coated positive films are used. (1930)

Maxwell Experiment—The first demonstration of the principle of additive synthesis with color-separation negatives. Clerk Maxwell and Thomas Sutton in 1861 produced a set of four plates and projected them in register before an audience.

Maxwell Primaries—The colors red, green, and blue-violet used by Maxwell to demonstrate the application of the Young-Helmholtz theory to color photography.

Micron—A unit of length equal to 0.001 mm. (10^{-3} mm.). Used frequently to designate the wavelength of radiant energy in the infra-red region.

Millimicron—A unit of length equal to 0.000001 mm. (10^{-6} mm.). This is the unit usually used in colorimetrics in expressing the wavelength of radiant energy.

Minus Color—The color which is complementary to the color that

is named; for example, *minus red* is a color complementary to red.

Mirror, Semi-Transparent—A mirror uniformly coated with reflecting material in such a manner that part of the light incident upon it is reflected, the other part passing through the surface. A type of beam-splitter.

Moiré Effect—A "watered" pattern produced when two or more screens bearing a system of fine regular lines or similar pattern are superposed nearly but not exactly in register.

Monochrome—A picture executed in a single color.

Mordanting—See DYE MORDANTING.

Morgana Process—A two-color additive process of color cinematography (for 16-mm. reversal pictures). In the projector, the film is moved two frames forward, one backward, and so on. Effective camera and projection speed is 24 frames per second, although the special projector movement produces 72 alternations per second. (1932)

Mosaic Screen Plate—A color screen plate.

Motion Fringe—A fringe of color occurring at the edge of images when the color-separation negatives are taken at different instants.

Multicolor Process—A two-color subtractive 35-mm. cinematographic process. The negative is made with a bipack. The colored print is made on double-coated film. (1929)

Neutral Color—Gray; achromatic; possessing no hue.

Neutral Filter—See FILTER.

Neutral Wedge—A wedge composed of a neutral (gray) absorbent material.

Orthochromatic—1. Characterizing the equivalence between the photographic effect of various colors upon a photographic material and the physiological effect upon the eye. 2. By usage, characterizing a photographic material sensitive to all colors except red.

Paget Color Screen Plate—A regular mosaic color screen plate (1912), available commercially since 1929 as the Finlay plate.

Panchromatic—Characterizing a photographic material sensitive to all colors of the visible spectrum.

Parallax—The apparent displacement of an object as seen from two different points.

Pathéchrome Process—A cinematographic process in which color is

applied to a black-and-white print through a celluloid film stencil. (1928)

Photochromoscope—See CHROMOSCOPE, *Kromskop.*

Photocolor Process—A two-color subtractive process using a twin lens camera and dye-toned prints on double-coated film. (About 1930)

Pigment—An insoluble colored material in finely divided form.

Pilney Process—A two-color subtractive cinematographic process. (1930)

Pinachrome Process—A printing process based upon the use of leucobases which oxidize upon exposure to light, yielding color images which are assembled by superposition.

Pinatype Process—A subtractive three-color process for still pictures based upon the differential staining action of certain dyes for hard and soft gelatin. (1906)

Primary Colors—Three colors, which, when mixed in the proper proportions, can be used to produce all other colors. The three colors most commonly used are red, green, and blue-violet.

Prismatic Spectrum—A spectrum formed by a prism.

Purkinje Effect—A shifting of the visibility curve to shorter wavelengths at decreased intensities, *e. g.*, as intensity is decreased object colors may change from reddish to bluish.

Quality (color)—CHROMATICITY.

Quality of Radiation—An expression which refers to the spectral composition of the radiation. In both photography and in the viewing of colored pictures the quality of the radiation used is important.

Ratio Diaphragm Cap—A mask placed over a banded tricolor filter shaped to permit a predetermined ratio of the different colors of light to pass through a filter for lenticulated film color photography.

Ratiometer—Any device used to test the actinic equality of differently colored lights transmitted to the photographic material in making color separation negatives.

Raycol Process—A two-color additive process of cinematography. The image pairs are exposed ($^1/_4$ standard size) on each frame and disposed in diagonal corners of the frame. The image pairs from contact positives are superposed by a suitable optical system. (1930)

Register—*v. t.* To cause to correspond exactly; to adjust two or more images to correspond with each other. Such correspondence may be required either in printing or in projection. *n.* A state of correspondence.

Relief Process—Any color process in which relief images are produced, for the purpose of matrix printing.

Resist—A coating used to protect certain portions of a surface upon which an image or design is to be produced by etching, dyeing, or other chemical or physical treatment.

Rods—One of the two chief light-sensitive elements of the retina. See CONES.

Saturation, Color—The degree of freedom of a color from admixture with white.

Saturation Sensibility—The sensibility of the eye to saturation.

Screens, Color—See COLOR SCREEN.

Screen-Plate Process—See COLOR SCREEN.

Sennettcolor Process—A subtractive cinematographic process using a bipack negative and a double-coated film for the print. (1930)

Sensation Curves—See COLOR SENSATION CURVES.

Sensitizers—Materials, usually dyes, used to increase the sensitivity of photographic emulsions to light of various wavelengths.

Separation, Color—See COLOR SEPARATION.

Sirius Process—A two-color subtractive cinematographic process in which alternate frames of the negative are exposed with the aid of a beam-splitter, and the positive print is made upon double-coated film. (1929)

Soft Gelatin Process—A process in which there is preferential dyeing of soft gelatin portions of the image. See *Pinatype.*

Spectral Composition (of radiation)—The specification of the relative energy at different wavelengths of radiation emitted by a source, or reflected or transmitted by a material; usually shown graphically as a spectral distribution curve.

Spectral Distribution Curve—See SPECTRAL COMPOSITION.

Spectral Energy Curve—See SPECTRAL DISTRIBUTION CURVE.

Spectral Sensitivity—The sensitivity of a light-sensitive material (or instrument, such as a photoelectric cell) to radiation of various wavelengths.

Spectral Transmission (of a filter)—The extent to which a filter will

transmit radiation of different wavelengths. Shown graphically as transmission, opacity, or density plotted against wavelength.

Spectrogram—A photograph of a spectrum. See WEDGE SPECTROGRAM.

Spectrophotometer—A spectroscope with a photometric attachment used to determine the relative intensity of two spectra or spectral regions.

Spectroscope—An instrument for forming a spectrum and measuring wavelengths in various regions throughout the spectrum.

Spectrum—An image of a source formed by light or other radiant energy through the medium of an optical device which refracts or diffracts the radiation of different wavelengths to different degrees. Throughout the visible spectrum of a continuous light source the spectrum appears as a number of juxtaposed areas of color varying from red to violet; *e. g.*, the rainbow.

Spicer-Dufay Process—See *Dufaycolor Process.*

Splendicolor Process—A three-color subtractive process in which the three-color separation records are printed as follows: blue record upon one side by iron toning, and the yellow and red as successive color layers upon the opposite side by dyed bichromate methods. (1928)

Subtractive Primaries—The three printing colors used in a three-color subtractive process; usually named magenta (minus green), blue-green (minus red), and yellow (minus blue).

Subtractive Process—A process of reproducing objects in natural colors using a restricted number of primary component colors in which the composite image is produced by passing a single beam of white light successively through two or more layers of colored images, each of which absorbs one region of the spectrum which is passed by the other layers.

Tanning Developers—Solutions which cause hardening, or which render insoluble, the gelatin of an emulsion in proportion to the amount of latent image converted into silver.

Technicolor Process—A trade-name applied to various types of subtractive cinematographic color processes. (About 1915) At one time marketed as a two-color relief process; more recently as a three-color imbibition process.

Three-Color Process—Any process, either additive or subtractive, for producing photographs using three primary colors.

Tinctorial Power (of a dye)—The reciprocal of the concentration necessary to produce a given amount of absorption in a layer of given thickness.

Tintometer—An instrument for estimating or specifying color by comparison with a graded series of standard colors.

Toning—See CHEMICAL TONING, DYE TONING.

Transfer Process—A process in which an image, usually dyed or pigmented, is transferred from one surface to another.

Trichromatic Process—See THREE-COLOR PROCESS.

Tricolor Filter—1. A composite filter containing areas of three primary colors; 2. A single filter of one of three primaries.

Tripack Process—A process of exposing three films (or plates) simultaneously, in which the films are arranged as a pack so that the outer films (or interposed filters) transmit certain portions of the light to expose the following layers. (*cf.* BIPACK).

Two-Color Process—Any process, either additive or subtractive, for producing photographs using two colors.

Utocolor Process—A three-color subtractive transfer process using the bleach-out method for making a color print by printing from a color transparency. It depends upon the bleaching property of certain wavelengths for certain dyes. (1895)

Visibility (of radiation)—The ratio of the luminous flux (lumens) to the corresponding energy flux (watts).

Visibility Curve—A graphical representation of the relation between visibility (expressed relatively) and wavelength. This curve has a maximum in the green at 555 mμ.

Vitacolor Process—An additive two-color cinematographic process similar to Kinemacolor. (1930)

Warner-Powrie Process—A three-color regular line-screen process. (1905)

Wedge—An optical device composed of absorbing material in which the transmission varies progressively from point to point. Such a device may cause a variation in either hue or intensity, or both.

Wedge Filter—See WEDGE.

Wedge Spectrogram—A spectrogram produced by photographing a spectrum through a neutral wedge (sometimes an optical

wedge), placed usually over the slit of the spectrograph. Such a spectrogram shows graphically the effective photographic sensitivity *vs.* wavelength for the photographic material and light source used.

White Light—Radiant energy which has a wavelength-intensity distribution such that it evokes a neutral gray (hueless) sensation in the average normal eye.

White Object—An object of a color such that it reflects all wavelengths of the visible spectrum equally; an object which if illuminated by white light will appear without hue to the average normal eye.

Wratten Filters—A widely used commercial brand of color-filters.

Young-Helmholtz Theory (of color vision)—An explanation of phenomena of color vision assuming three separate elements in the normal eye, each stimulated by a different section of the visible spectrum.

Zoechrome Process—A three-color subtractive process of color cinematography with a black-and-white key. In the camera every alternate frame is normally exposed; on each remaining frame, three images are exposed through primary filters. The standard size image is printed first, and each of the color-images in succession is enlarged and superposed upon the first. Between successive printings, the film is varnished and re-coated with emulsion. Each image layer is dye-toned before the next layer is added. (1929)

Zoetrope Process—Probably the first color photography process using the rapid substitution of primary images before the eyes. (1869)

COLOR COMMITTEE

C. TUTTLE, *Chairman*

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