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● John Seitz will talk about Rhythm with Light. Mr. Seitz is considered one of the outstanding cinematographers of the industry. This will be the second in a series of articles on the artistic side of cinematography as practiced by the leading cinematographers in Hollywood. This month Victor Milner talked on Mood in Lighting. Mr. Milner gives a glimpse of what the average cinematographer aims at when shooting the present-day picture.

● There will be other articles in our next issue. The Cinematographer with Fother Hubbard on his latest expedition will tell you of his experiences.



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THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science. Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship. To this end its membership is composed of the outstanding cinematographers of the world with Associate and Honorary memberships bestowed upon those who, though not active cinematographers, are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science. To further these lofty aims and to fittingly chronicle the progress of cinematography, the Society's publication, The American Cinematographer, is dedicated.

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Creating Moods With Light

by
Victor Milner, A.S.C.



LIGHT is the Cinematographer's most versatile tool. With it he can not only make or break his composition, and display his players to advantage or otherwise, but he can attune the audience-mind to any mood, and key the response to any emotional pitch. Intelligent lighting can prepare the audience for any desired dramatic tempo, and create a subconscious, emotional receptiveness that greatly enhances the dramatic value of the production.

It is not enough that a scene be an intrinsically beautiful bit of photography: it is essentially a vehicle for dramatic expression, and every phase of the photography—especially the lighting—should exist for the specific purpose of telling the scene's story. The Cinematographer who strives solely for pictorial effect, and the man who rigidly follows a fixed scheme of lighting for every production both hamper themselves tremendously. Lighting technique should be flexible, changing (even within a sequence) to harmonize with the mood and tempo of the action.

The Cinematographer should train himself to think directly in terms of lighting. He should be able to read a script and from the bare printed outline of a scene, visualize it not merely in terms of action, or even of camera-angles and moves, but in terms of lighting. It is easy enough to read a heavy, dramatic scene which must necessarily be sombre and slow-paced, and understand that it must be photographed in a low key; or to glance over a swift-paced comedy scene, and see that it will require high-key lighting; but the really important thing is to be able to form such a clear mental picture of the light-treatment of a scene that the lighting itself expresses the scene's mood, tempo and character as clearly as do dialog and action.

Picture, for example, this situation: in a bed in a small room, an old man lies dying; beside him sits his wife, who has shared his joys and sorrows for perhaps fifty years, tensely watching, waiting for the crisis. Different individuals, I suppose, would visualize this in different ways; to my mind, it conjures up at once a mental image of dramatic light-effects. I can see the scene lit in a very low key, with only an extremely repressed scale of gradations. The figure in the bed is limned in grayish light, while the motionless figure of the wife is half hidden in shadow—ominous, formless shadows, relieved only by the subdued illumination on the bed-ridden figure. The lighting alone,

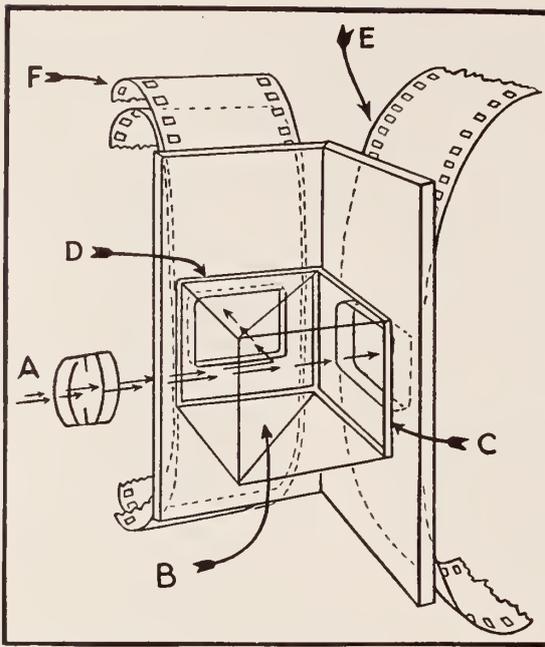
unaided by dialog or action, could tell the story perfectly. An atmosphere of such dramatic power could be built up by skillfull lighting that the audience would inevitably experience the tense, wordless cgony of the situation, and sense the breathless emotion of an actual deathbed.

Before the advent of sound and dialog, 90% of the responsibility of securing the desired emotional effect in such a scene lay in the hands of the Cinematographer. Today, even with the great advantages of speech, vocal inflection, music and sound-effects, it still rests with the Cinematographer whether the scene shall be merely a well-acted scene, or a gripping emotional experience. The true test of Cinematography is the emotional and dramatic effect it would convey if viewed without the assistance of the sound-track.

To a very limited extent, changes in the mood and tempo of lighting may be brought about by increasing or decreasing the actual amount of light used; but the most essential factors in producing such effects should be judicious manipulation of the lighting-balance, and of the diffusion used on both camera and lights. My personal preference is to minimize the diffusion introduced photographically, and to substitute controlled diffusion in illumination. Photographic diffusion is, at best, an unnatural and unsatisfactory thing, and often the difference in diffusion between a longshot and its correlative close-up becomes physically as well as esthetically a jarring note. The best practice, therefore, is to maintain a fairly constant standard of photographic diffusion throughout, and to manipulate the diffusion in lighting to produce the effects desired.

In the same way, altering the light-diffusion and the beam-concentration is often preferable to substituting larger, smaller or optically different units as the camera-angle changes. A condenser-type spotlight, for example, will give a more intense beam than the average mirror-lamp of the same wattage, and the two are sometimes used interchangeably for certain effects. I have found, however, that the light from the condenser lamp is much whiter, and can be cruelly deceptive when attempting to balance it with other, yellower illuminants, so it is better to use the same unit, altering the diffusing media and

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Detail of Three-Color Technicolor Camera.
 A—Path of light through lens and beam-splitter.
 B—Beam-splitter (partially reflecting prism).
 C—Green filter in Aperture.
 D—Magenta filter in Aperture.
 E—Super-sensitive film for Green negative.
 F—Bipack film for Red (rear) and Blue (front) negatives.

FOR NEARLY forty years it has been acknowledged that natural-color cinematography could not attain widespread commercial success until a really practical three color-component process was developed. During that time, innumerable experiments have been made, and scores of patents granted, upon three-color processes, some of which gave excellent results under laboratory test-conditions. None of them, however, proved successful under the rigorous test of commercial production. None the less, rumors have always been rife that such a process was just around the corner—just short of commercial perfection.

For the past decade, these rumors have been justified, for it has been known that the exponents of Technicolor—already successful as a two-color process—were developing a trichromatic process. No official hint, however, came from the Technicolor laboratories, where everyone was much too busy solving the laboratory problems of processing two-color films in quantity to make any statements about possible three-color developments.

Late in 1932, Technicolor announced that the new three-color process was a fact, and was commercially available. Since then, the process has been used in over a score of Walt Disney's "Silly Symphonies," in musical and travel "shorts," and in special color sequences climaxing such productions as "The Cat and the Fiddle," "The House of Rothschild," and "Kid Millions." The three-reel featurette, "La Cucaracha"—a gem of natural-color photography—bids fair to make the industry acutely color-conscious, and the same producers are even now bringing "Becky Sharp" to the screen as the first trichrome feature. The process has proven itself in cartoon work, on location, and in the studio: every sign (not the least of which is returning box-office prosperity) points to a considerable use of the process in the coming year's more important productions. What, then, is Three-Color Technicolor?

Essentially, it is exactly what the name implies: a new process of natural-color cinematography which utilizes three, instead of only two, color-components. Other than the name, it has very little in common with the older, two-

Explanation

color Technicolor. The camera-equipment with which it is photographed is new, and far sturdier than previous color-cameras. The results are superior to any previous commercial color-process. Most important of all, with the new process comes a basic change in Technicolor's policy toward cameramen.

At this point, it may be well to clarify the significance of the term "three-color" process. Medical science tells us that the human eye receives its color-impressions through three primary nerve-centers, each of which transmits to the brain one primary color impression. The three colors thus received—red, yellow and blue—are termed the primary colors, and all other color-impressions are made up of varying combinations of these three. (Green, for example, is a simple overlapping of blue and yellow impressions.)

This same principle is the foundation of all forms of natural-color photography and cinematography. Obviously, if we make three black-and-white negatives of a scene, recording on one plate all of the red elements, on another, all of the yellows, and on the third, all of the blues, we shall have duplicated the selective action of the three color-sensory nerve-centers of the eye. If then we make positive transparencies from the three negatives, toning each in its appropriate hue, and view the three superimposed, we shall have duplicated the resynthesizing brain-action, and should arrive at the same result—an image of the scene in its natural colors.

It is by no means easy, however, to apply this principle to photography in a practical way; and applying it to cinematography raises innumerable mechanical and technical difficulties—especially if the process is to be used commercially. The three separation-negatives must be exposed at the same time, through a single lens. The color-filters which must be used to produce these separations absorb a great deal of light, necessitating increased exposure—yet the films must be made at the standard sound-speed of 90 feet per minute. The cameras and their optical systems must be of unusual optical and mechanical precision—yet they must be sturdy and simple, as well as being relatively light and portable. The laboratory processes should be simple and dependable. The prints must be such as to run on any projector without special equipment: this necessitates that the prints be "subtractive," that is, that they have a perfect picture, of standard dimensions, in full color. The question of graininess in large-screen projection rules out the screen-plate method, which has been so successful in still photography.

Reducing the number of color-components used from three to two reduces the technical problems proportionately. At the same time, a two-color process is more or less color-blind: it gives a fair suggestion of actual color, but it cannot give natural color, since it omits one-third of the primary color-components. None the less, every pre-

of the Trichrome Technicolor

by

William Stull, A.S.C.

vious color-cinematography process which has achieved any degree of commercial success has been a two-color process. Nearly all of them have used colors which in some measure have partaken of the missing third: in some instances, red-orange and blue; in others, red and blue-green, or red-orange and blue-green. In any case, the majority of colors have been rendered with more or less distortion, while others simply could not be reproduced. In addition, the two primaries were generally exaggerated to some extent.

Technicolor's two-color process was probably the most successful of the lot, but it, no less than the rest, suffered from partial color-blindness, and the cameras were noisy and delicate. The two images—red-orange and green—were recorded on a single film, which moved at twice normal speed. A single lens was used, and its image was divided by a beam-splitting prism: the red image being reflected to a position one frame below the normal axis, while the green image was two frames above the usual gate. The film was moved two frames at a time, and consumed double footage required for photographing the same action in black-and-white. Printing was either on double-coated positive stock (by a special optical printer) or by the imbibition process. The latter proved the more economical, though at first the results were not satisfactorily uniform, a difficulty now understood to have been overcome. The cameras were excessively noisy, and were not popular with sound-engineers.

The three-color process is in many ways simpler than the two-color method. Three separate films are used, exposed through a single lens, at standard speed. All three are standard types: those receiving the red and green images are standard SuperSensitive Panchromatic, while the blue is recorded on the familiar red-ortho. All three are hypersensitized in the Technicolor plant.

The optical system is simplicity itself: standard Cooke lenses are used (recalibrated by Technicolor). Behind the lens is a simple beam-splitter, which reflects 2/3 of the light from the lens through an aperture to the left, placed at right angles to the normal position, and passes the remaining 1/3 straight through to a normal aperture. This latter aperture is fitted with a green filter, and a green record is made on regular SuperSensitive film at that point. The second aperture is fitted with a magenta filter (transmitting blue and red light), behind which moves ordinary

bipack film. The red-ortho film which forms the front component of the bipack, naturally receives the blue image; its dyed outer surface, in contact with the rear film (SuperSensitive Panchromatic), acts as a red filter, so that this third film receives only the red image. On exterior scenes a light yellow filter is usually placed on the lens, presumably to exclude the ultra-violet and curtail some of the violet, maintaining the proper chromatic balance.

The camera was designed and built by Technicolor, with special Mitchell movements. While it is more silent than many earlier color cameras, the triple-film movement makes it necessary to use the camera heavily blimped for sound work. Naturally, it is considerably larger and heavier than ordinary black-and-white cameras, but not unduly so. It is a decidedly modern design, and definitely built for hard service. The beam-splitting optical system—the weak point of previous Technicolor cameras—has been so simplified that it is not only foolproof, but extremely rugged. It can easily be removed, but the design is such that it can only be replaced in the proper manner, and in exactly the right adjustment. The camera-head is box-form in shape, and somewhat reminiscent of several of the silent (black-and-white) cameras lately introduced. Above it are mounted the special 1,000-foot magazines. These magazines are of triple width, to contain the three films; and, unlike conventional magazines, they are loaded from the right-hand side, with the take-up mechanism on the left. Ingress to the two movements is had through three openings—one at each side and one in front. All three must be used in threading the camera. A conventional sunshade and finder are fitted in the customary manner.

Focusing is primarily by scale, for which the lenses are calibrated with unusual accuracy. It is possible, however, to check the focus on a ground-glass screen through an eyepiece at the side of the camera. However, as this screen receives only a small part of the light from the lens, due to the beam-splitter, the image is generally very dim, and it is best to rely on the lens-calibrations for focusing.

Continued on Page 12



View of a Technicolor Three-Color Camera.



PHOTOGRAPHY

of the MONTH

"FATHER BROWN, DETECTIVE" (Paramount)

Theodor Sparkuhl, A.S.C.: Directing Cinematographer
Daily Variety (November 21, 1934): "Theodor Sparkuhl has turned in a fine job with the camera—."
Hollywood Reporter (November 21, 1934): "—well photographed."

"BRIGHT EYES" (Fox)

Arthur Miller, A.S.C.: Directing Cinematographer
Daily Variety (November 22, 1934): "Photography by Arthur Miller is good."
Hollywood Reporter (November 22, 1934): "Arthur Miller's photography passes with a high mark."

"WEST OF THE PECOS" (Radio)

James Von Trees, A.S.C., Russell Metty, A.S.C.: Directing Cinematographers
Hollywood Reporter (November 22, 1934): "Beautiful photography of the great open spaces provides the last requisite touch."
Daily Variety (November 22, 1934): "—exterior photography by Van Trees and Metty is tops."

"BEHOLD MY WIFE" (Paramount)

Leon Shomroy, A.S.C.: Directing Cinematographer
Hollywood Reporter (November 22, 1934): "Shomroy's photography is excellent throughout."

"THE MIGHTY BARNUM"

Peverell Morley, A.S.C.: Directing Cinematographer
Daily Variety (November 22, 1934): "—well photographed."

"STRANGE WIVES" (Universal)

George Robinson, A.S.C.: Directing Cinematographer
Hollywood Reporter (November 24, 1934): "Robinson's photography is very good."
Daily Variety (November 24, 1934): "—plus fine photography—."

"JEALOUSY" (Columbia)

John Stumar, A.S.C.: Directing Cinematographer
Hollywood Reporter (November 24, 1934): "—and the photography by John Stumar helps considerably."

"FORSAKING ALL OTHERS" (M-G-M)

Gregg Toland, A.S.C., George Folsey, A.S.C.: Directing Cinematographers
Hollywood Reporter (November 26, 1934): "—and Gregg Toland's photography adds its particular artistry to the elegant whole."
Daily Variety (November 26, 1934): "Piece is exceptionally well photographed." "Joan Crawford gets from Gregg Toland and George Folsey the best benefit of camera she has had in a long time."

"GRAND OLD GIRL" (RKO)

Lucien Andriot, A.S.C.: Directing Cinematographer
Hollywood Reporter (November 26, 1934): "Photography throughout the picture is okay."

"THE MARINES ARE COMING" (Mascot)

Ernest Miller, A.S.C., William Nobles, A.S.C.: Directing Cinematographers
Hollywood Reporter (November 27, 1934): "Camera work is first class throughout—."
Daily Variety (November 27, 1934): "Excellent photography by Ernest Miller and William Nobles—"

"HERE IS MY HEART" (Paramount)

Karl Struss, A.S.C.: Directing Cinematographer
Hollywood Reporter (November 28, 1934): "Photography and mounting are first rate throughout."
Daily Variety (November 28, 1934): "Some outstanding camera work reflects painstaking effort on the part of Karl Struss."
Motion Picture Daily (November 30, 1934): "Karl Struss' photography embellishes the exquisite backgrounds."

"SWEET ADELIN" (Warner Bros.)

Sol Polito, A.S.C.: Directing Cinematographer
Daily Variety (November 28, 1934): "Sol Polito deserves high praise for handling of the camera."

"THE FIGHTING ROOKIE" (Mayfair)

James Brown, Jr., A.S.C.: Directing Cinematographer
Hollywood Reporter (November 30, 1934): "Good photography."

"MAN WHO RECLAIMED HIS DEAD" (Universal)

Merritt Gerstad, A.S.C.: Directing Cinematographer
Daily Variety (December 1, 1934): "Photography by Gerstad is excellent—."
Hollywood Reporter (December 1, 1934): "Merritt Gerstad's photography is beautiful throughout, with a few scenes at the beginning of the picture that are stand-outs of the art."

"HELLDORADO" (Fox)

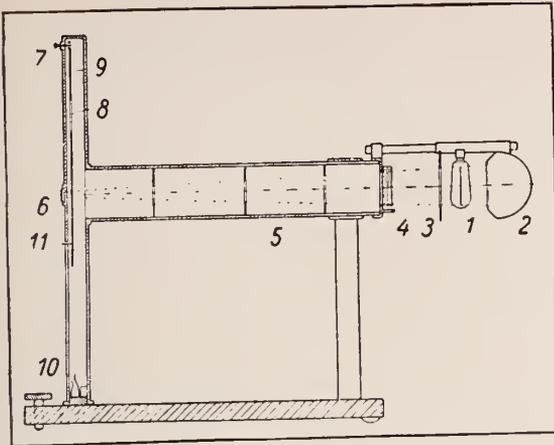
John Seitz, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 5, 1934): "—and the camera work by John Seitz is very lovely, particularly the scenes shot through cobwebs."

"LOTTERY LOVER" (Fox)

Bert Glennon, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 5, 1934): "Bert Glennon has turned in his usual good photography."

"ENCHANTED APRIL" (Radio)

Edvard Cronjoger, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 6, 1934): "Photography very good."



3. Apparatus for making the exposure by the DIN method. The light emerging from the light source (1), behind which is placed a black body (2), passes through diaphragm (3), liquid filter (4), diaphragmed tube (5) to the test strip placed in the dark slide (6) behind the gray wedge. The exposure follows the drawing of the pin (7), whereby the falling shutter (8-9) provided with a slot falls freely and admits light to the plate holder for .05 second. The spring (10) serves as a guide for the shutter, which after exposure is raised again by means of the lever (11).

The Din-Scale

New Measure of Photographic Sensitivity

by
Martin Biltz, Dessau*

*Translation from: Die Naturwissenschaften, 21: Oct. 13, 1933, 734-6.

THE sensitivity of a photographic emulsion can be characterized in an exact sense only by a great number of exposure steps. In picture photography, however, one desires the sensitivity represented by a single number, where the correct diaphragm setting and exposure time can be chosen from existing exposure meters and exposure tables. In order to accomplish this wish, no efforts were spared during the past century. However, only lately has a practical serviceable method been obtained. In what follows, the sensitometric systems of Scheiner, Hurter and Driffield, Eder-Hecht, used up to the present time for this purpose will be briefly described. Mainly, however, the new system proposed by the Standardizing Committee on Sensitometry of the German Society for Photographic Research, is to be considered.

If it is desired to characterize exactly the sensitivity then the density S produced on a photographic plate after development and fixing must be specified as a function of the intensity of the exposing light (measured in e.g. watts/cm²), the exposure time, and the wavelength of the exposing light.² In order to obtain a single sensitivity number for use in practical exposures, the following simplifications are made. 1. The American viewpoint on this question was recently made public by a report of the re-

search by Davis and Neeland on this point. (Naturwiss. 21, 340, 1933.) 2. $S = \log I_0/I$. I_0 = intensity of the incident light, I the intensity of the transmitted light.

1. In order to eliminate the complication of the variation of sensitivity with light of varying wavelength in the visible spectrum, the sensitivity is considered for a complex spectrum containing many wavelengths. This simplification is permissible providing that the spectral energy distribution of the light source (for determining sensitivity) is the same as that of the light source for the practical exposure.

2. Either the intensity of the incident light or the exposure time is maintained constant and the dependence of density entirely upon one of these two factors is considered.

3. Among the abscissa values of the density curve (exposure time or light intensity) a single value is chosen as characteristic of the sensitivity. In this manner, a number of the dimensions $\frac{\text{intensity} \times \text{time}}{\text{emulsion surface}}$, which may also be expressed in ergs/cm², is obtained.

The above so-called simplifications have been accomplished differently by the different sensitometric systems.

Scheiner accomplished the simplification by employing a Benzin flame; Hurter and Driffield employed burning magnesium ribbon. Of all these light sources, none corresponded in spectral energy distribution to that of the sun, which is the source most often used in practical photography. In comparison with the energy distribution in sunlight, the energy distribution of the lamp used by Scheiner and Hurter and Driffield rises especially high toward the red end of the spectrum, so that a comparison of the speeds of orthochromatic and particularly panchromatic emulsions with the speed of unsensitized emulsions tested with these light sources show a much greater difference than they would for a practical exposure to sunlight. Also the light of burning magnesium ribbon differs greatly in its spectral distribution from sunlight.

The simplification was accomplished by Scheiner and by Hurter and Driffield by holding the light intensity constant. This intensity is defined by the output of the light source. The exposure time is graduated, and in both methods a disk provided with cutout segments placed between the light source and the photographic emulsions admits the light for different lengths of time on different parts of the emulsion. In this manner a time scale is impressed on the emulsion. Eder and Hecht chose the exposure time constant and varied the light intensity by means of a gray wedge placed in front of the photographic emulsion.

The simplification was accomplished in the same manner in the methods of Scheiner and of Eder and Hecht. The sensitivity is characterized by that single exposure time (Scheiner), single light intensity (Eder and Hecht), which produces on the photographic emulsion a density which appears to the eye just higher than the density of a neighboring unexposed point (fog density). The visual determination of this just perceptible density, the so-called threshold value, on the test strip is very uncertain. This

Explanation of the Trichrome Technicolor

Continued from Page 9

The actual operating methods are interesting. The lenses are calibrated with a special system of stop numbers totally unlike any of the systems generally used. The maximum aperture of the standard lens used is arbitrarily taken as unity, and numbered 1; the smaller openings bear progressively larger numbers. However, in order to double the amount of light passed at any given opening—No. 16, for example—one does not open up to the next smaller number, but halves the indicating digit—in this case, opening to No. 8.

On all interior scenes, arc lighting is used almost exclusively. The method of computing the exposure—which is on even more vital factor than in monochrome cinematography—is unusual. A standard Weston illuminometer is used. This is a photoelectric light-measuring device, operating on the same principle as the familiar Weston photonic exposure-meter, but more sensitive, and calibrated to read in lower brightnesses. This is placed in the position of the subject, and three separate readings are taken: one with the photocell pointed directly at the camera, one aiming 45 degrees to the right, and another 45 degrees to the left. These are averaged, and this average forms the basis of the exposure calculation. If necessary, of course, special readings are taken in shadow areas, and the like, as the exposure latitude of the process is not so great as that of ordinary black-and-white. A further important factor is the color of the objects and surfaces being photographed, as the reflectivity of different colored surfaces is more important than in monochrome. When working out-of-doors, the illuminometer is fitted with a neutral-density filter, to offset the excess illumination from the sun.

Inevitably, natural-color cinematography requires a good deal more light than is normally used in monochrome. Exactly how much cannot be said, due to the extreme variations in the lighting technique of individual cinematographers. It is understood, however, that photometric measurements recently made by an impartial observer have shown that the light intensity used for black-and-white cinematography by some cinematographers, and that normally used on sets where three-color Technicolor is being used, are very nearly the same. Mr. J. A. Ball, Technicolor's Chief Engineer, states that the three-color process requires only a slight increase in illumination over the standard normally maintained for black-and-white by the average "heavy lighter."

However, the process demands much

more careful attention to lighting balance than does black-and-white. The lighting must be extremely even; brilliant, but with neither excessive highlights nor shadows. The highlights, especially, must be watched, lest they be "washed out." Back-lighting, while effective, is not generally used in anything like the degree normal in monochrome cinematography. In exterior scenes, a three-quarter cross-light seems preferred, though back-lightings, when amply balanced by reflectors or booster-lights, are often very effective. Colored light, while it plays surprising tricks with the color-rendition of objects upon which it falls, can be extremely effective if intelligently used.

It is perhaps expressive of the confidence which the Technicolor authorities have in their new process that they have executed an abrupt about-face in their policy as regards camera personnel. Heretofore, it will be remembered, Technicolor maintained its own camera staff of specialized Technicolor Cinematographers, Operatives and Assistants, who were sent to any studio making Technicolor pictures, and had complete physical charge of the camerawork, though the Technicolor Cinematographer usually cooperated with a Directing Cinematographer from the studio's staff in the photographic direction of the film.

Now, however, Technicolor's policy is to be different. According to Mr. Ball, Cinematographers, Operatives and Assistants from the major studios (and possibly some free-lance Cinematographers of standing, as well) will be invited to the Technicolor plant, and given a special course of instruction in Technicolor cinematography. In the end, it is hoped to have a complete Technicolor-trained camera-crew in every major studio, so that when a producer decides to film a production in Technicolor, he will be able to entrust its photography entirely to members of his own staff. This policy should be of great benefit to Technicolor, for it will not only develop greater variety and individual style in Technicolor productions, but it will also eliminate the divided responsibility (and its inevitable friction) which seemed inseparable from the old arrangement.

According to Cinematographers who have already used the new process, it is extremely easy to master, and very practical. Ray Fernstrom, A.S.C., recently spent several months in Europe, filming travel films in three-color Technicolor for James A. Fitzpatrick Travel-talks (MGM release). He states that before he left on the trip, he was able to photograph only 1,000 feet of tests

—which constituted his only introduction to the practical aspects of the process. Thereafter, he photographed thousands of feet of film, under unfamiliar conditions, with no failures or difficulties of any nature. Moreover, he remarks, the camera stood up, not merely under the normal treatment incident to such a tour, but under the far from tender ministrations of French baggage-men, who do not consider any package set down unless it bounces at least a foot!

The laboratory manipulation of trichrome Technicolor allows at once both more and less control than is usual in ordinary work. The three negatives are developed by machine, to a rigidly fixed time. A very considerable degree of control is possible in printing, however, not alone over density, but also over the color-balance.

The prints are made by the imbibition process. In this process, a matrix is made from each of the three color-separation negatives, by printing onto a special film coated with dichromated gelatin instead of the conventional emulsion. This is "developed" in warm water, which causes the portions affected by the printing-light—that is, the shadows—to expand, forming a relief image. This matrix is then dyed—each matrix being dyed the **complementary** color of its negative: the red negative's matrix being dyed cyanin blue-green; the green matrix, magenta; and the blue matrix, yellow. The three matrices are then successively printed in accurate register onto clear film: as each matrix has absorbed its dye only in the relief portions of its image (that is, in the shadows), it prints only where the original negative has recorded little or no color, while its complementary-colored matrix prints in the color actually recorded by the first separation-negative. (In this stage, incidentally, the word printing is used in the printer's sense, for the matrices print in exactly the same general manner as type.) When the positive has been so printed, and dried, it is complete, and ready for use.

During the Technicolor boom of 1929-30, there was a great deal of dissatisfaction with imbibition prints, due largely to the "bleeding" of the colors, to lack of sharpness, and to the absence of uniformity of color. The greater part of these difficulties, however, have been overcome, and modern "IB" prints are generally quite pleasingly sharp, with a minimum of bleeding and color-variation.

A great deal of control is possible through the processes of matrix-printing, dying and printing, and the density and color-balance can be modified almost as much as is the density of a normal black-and-white print. Colors can be increased or decreased; a strictly accurate rendition can be had, or a

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chromatically distorted one, for special effect, can be produced.

At present, the cost for photography and print of trichrome Technicolor is high: approximately thrice that of monochrome. Naturally, three times as much negative must be used as would be necessary for black-and-white. This is understood to cost 7½c per foot. Negative developing is stated to cost 2c per foot, while rush printing is priced at 12c per foot, with release-printing figured at 5½c per foot. These charges will undoubtedly lower as the volume increases. The cameras are, of course,

provided on a leasing basis. At present, there are nine of the three-color cameras ready for use (complete with blimps), and several more are in process of construction. With the present policy, no large camera staff will be built up: the present staff, possibly slightly augmented, will probably be retained, with, of course, an adequate mechanical staff for repairs, etc., consulting color Art-Directors, and the like: but hereafter, the majority of Technicolor films will be photographed by the men already in charge of camerawork in the major studios.

marked extent, it would be of incalculable benefit to the Industry if more Producers and Directors made it a rule to consult the Cinematographer earlier in the preparatory stages of production, and to allow him more ample time to familiarize himself with the script before actual filming commences. There would result, of course, an immediate commercial advantage gained through more complete pre-production cooperation between the Cinematographer and the Art-Directors and Costumers, in that the physical production and the photography would be better coordinated beforehand, with less need of alterations during actual shooting. But mechanical details—while vastly important—are actually secondary to the importance of visualizing the artistic treatment of the production. A vital phase of this, incidentally, is the coordination of this treatment with the style and concepts of the Director. Given the same script and physical production, two Directors might turn out radically differing productions, each of which would demand basically different photographic treatment, to suit the differences in dramatic mood, tempo and general conception. The story of "Cleopatra," for example, might have been interpreted in innumerable different ways by different Directors: one might have chosen to concentrate upon the purely emotional phases of the character, while another might have made **Cleopatra** herself of secondary importance to Caesar and Antony. In either case, the photographic treatment—especially the style of lighting—would have to be basically different. Cecil De Mille, in his recent production of the story, which I photographed, emphasized yet another angle: the fact that Cleopatra was essentially a "showman," who instinctively dramatized her every surrounding, and amazed the luxurious Roman world with her calculatedly lavish display of Egypt's incredible wealth. Thus in this production, the photographic keynote was richness, and in every scene—even the most dramatic—the lighting was kept richly brilliant, to keep the audience subtly aware of the splendor of the settings and costumes. Similarly, Cleopatra's entertainments of Caesar and Antony were lit and photographed primarily as sensuous spectacles, the high-lights of her exhibitionistic nature.

I have photographed many of Ernst Lubitsch's sparkling comedy-romances, and more than a few similar stories directed by other Directors. Few, if any, Directors can impart to action and dialog the peculiarly brittle brilliance which characterizes Lubitsch's work; and where one might stress the romantic phases, requiring much softer lighting and photographic treatment, and another might play everything for broader comedy, requiring more conventional, highly-keyed lighting, Lubitsch's own style demands an equally distinctive, scintillating bril-

CREATING MOODS WITH LIGHT

Continued from Page 7

beam-concentration rather than substituting a unit of another type. The same applies to the "hard" arc-light, which is, however, extremely useful for photographing dead, heavy blacks, such as formal evening dress, for the bluer light of the arc reveals more detail in the black masses than does the more easily absorbed incandescent light.

Similarly, it is by far the best practice when working on a sequence in which a definite source-lighting has been established, to adhere closely to this source-light pattern throughout, substituting, perhaps, smaller units, greater diffusion,

or less concentrated beams in the closer shots, rather than altering the source-pattern and considering the closer shots as more or less independent of the basic long-shot.

These observations, however, are purely elementary, and have only a rudimentary bearing on the discussion. The real art of lighting for mood and tempo must depend primarily upon the individual Cinematographer's artistic sense, and upon his ability to visualize in terms of lighting.

Since the majority of Cinematographers have developed this faculty to a

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liance in photography and lighting which is rarely applicable elsewhere.

About the time that this appears in print, I expect to begin photographing Cecil De Mille's "The Crusades." While like most of De Mille's pictures, this will naturally stress the spectacular element, the interest (photographic as well as dramatic) centers mainly on two outstanding men—Richard of England and Saladin, the Saracen. This has a very important bearing on the photographic treatment of the film; especially upon the camera-angles and the lighting. Through my study of the script, and my daily conferences with Mr. De Mille, the Art-Directors, Costumers and others, I am carefully building up a mental image of the picture—scene by scene—as I want it to reach the screen. I am trying to visualize every angle, every phase of lighting, so that when I actually film each scene, I will have a definite, mental plan of the technical steps that must be followed so that the lighting will not only be in tune with the dramatic mood and tempo of the action, but will bring out the fundamental traits of each character.

The two principal characters are in every way of heroic proportions. Richard the Lion-Hearted, King of England and Duke of Normandy, characterizes the epitome of European Chivalry of the Middle Ages. Saladin, Sultan of Egypt,

represents all that was Knightly in the more highly cultured Saracenic nation. Both characters represent the flower of hardy, virile manhood, and tower above their fellows in body and in character. This gives an unusual opportunity for psychologico-dramatic cinematography. Strength and virility must predominate in the lighting of these men, who should be shown in strong relief against the pictorial, but less commanding background of the period and of their fallowers. To this end, I hope to depart from the conventional lighting technique; instead of avoiding contrasts and strong shadows, for instance, I plan to heighten them and to use them to express visually the strength of the two men. Using as little as possible of the conventional flat front-lightings and outlining back-light, I plan to simplify my personal lightings, throwing features into strong relief, modelled by heavy shadows that emphasize the note of ruggedness.

To this end, I expect to use very little diffusion, either in the camera or on the lights, and instead of carefully eliminating all the resulting shadows under cheek-bones, noses and chins, I plan to foster them, using them for dramatic effect. Wherever possible, I intend to enhance the effect of towering physical strength, so that these men tower physically as well as dramatically above the

other players. One scene in particular creates an especially strong mental picture in my mind: the scene where the two meet for a parley, surrounded by their aides. As I visualize the scene, the two men stand together in the center of the picture, strongly, boldly illuminated, and towering above their men, who are grouped behind them in a semicircle, partly obscured in shadow. The strength of the characters of Richard and Saladin can be expressed quite as much through the lighting as through dialog or action.

On the other hand, the women in the story demand the softest, most delicate lighting possible to fittingly express the Medieval ideal of womanhood. The "emancipated woman" of today was nearly ten centuries in the future, and the twelfth century Chivalric concept of womanhood was as of something fragile, ethereally lovely; almost too wonderful for the rough men of the period to even touch. This concept can be carried out in the lighting: soft, delicate lighting, possibly higher keyed and attuned to a greater degree of photographic diffusion. The contrast between the virile, almost harsh photographic rendition of the men, and the delicate, pictorial presentation of the women should go a long way to establish in the audience-mind this important dramatic contrast.

All of these concepts can be carried out in the personal lighting—the light-

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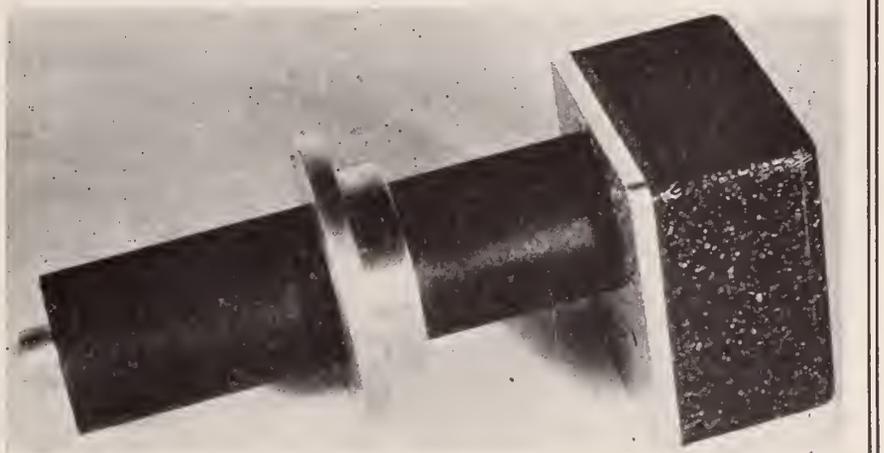
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ing of the players—while, like a musical undertone, the lighting of the settings synchronizes with the dramatic tempo of the action. Where the action moves at a dramatically swift pace, the set-lighting can be of a relatively high key; where it grows melodramatic, there can be greater brilliance in the general lighting. Where the action moves at a slower tempo, the lighting can strike a lower key. Moreover, the spirit of the period can likewise find much expression in the lighting. The buildings of the time were built for defense, rather than comfort; accordingly, the only

illumination within them was from torches and candles, aided, in the daylight hours, by thin shafts of sunlight filtering in through tall, narrow windows and loop-holes. To be historically correct, the lighting of such sets will have to reproduce, in some measure, this known condition—and the photographic effects so produced will convey a perfect visual impression of the rough hardihood of the age. With this background for the light-treatment of the players, there is an unusual opportunity for true dramatic cinematography and lighting.

THE DIN-SCALE

Continued from Page 11

point on the curve is dependent upon the absolute light intensity, and therefore upon the light source by which it is read and upon the amount of the fog density. (See the range indicated in Fig. 1 by Schaeffur.) 3. The primary

light energy (intensity x time) employed is accurately constant, since a definite quantity (2 mg) of Mg-ribbon is burned.

Finally it must be emphasized that this kind of evaluation of the speed is not good in practice. In picture photography it is not so very essential to know what exposure is required to produce a just visible impression on the emulsion as, the much more essential quantity, what exposure produces a good image. For the evaluation of speed according to the Hurter and Driffield system, a tangent to the density curve obtained from the exposed sensitometric strip is constructed. For the determination of the H and D sensitivity number, the number 34 is divided by the light energy measured in m.c.s. corresponding to the point at which the tangent crosses the abscissa. Apart from the consideration that this method of speed determination is very bothersome on account of the necessity of constructing the entire density curve, the value obtained does not correspond to that which in practice corresponds to sensitivity. So much trouble has arisen from the sensitometric systems spoken of, that it was resolved, in Germany, to produce a new method. The problem was to find a system of sensitometry capable of exact reproducibility of speed number, one which designated the sensitivity of a photographic emulsion in a useful manner for practice, the system to be adopted for perhaps three years by the German Society for Photographic Research and executed by one of its committees on sensitometry. The numerical value necessary for practical work has been worked out in detail in the laboratories of the Scientific Photographic Institute of the Technical High School of Dresden, the I.G. Farbenindustrie A.-G. (Agfa), and the Zeiss Ikon A.-G. also with the support of the Perutz G.m.b.H. A description of this work is to be found in an article by R. Luther in the Proceedings of the VIII International Congress for Scientific and Applied Photography, 1931, in Dresden. For an account of the

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details, the reader is referred to this article. From this point forward this new method of speed determination shall be considered with reference to the formerly outlined three simplifications.

1. The light source used possesses approximately the same spectral distribution as sunlight. It is obtained by means of a vertical filament tungsten vacuum lamp at a temperature of 2360° Abs. in combination with a liquid Davis and Gibson filter. The energy distribution of this light source in combination with this filter is compared with the energy distribution of the sunlight measured by Abbot.

2. The exposure time is constant and amounts to 0.050 sec., the light intensity is graduated by a gray step wedge in contact with the emulsion to be tested. The step wedge has 30 steps, each 4 mm. wide, which carry numbers 1-30. The first step (No. 1) has the density 0.10, the second a density 0.20, etc., the last step (No. 30) a density 3.0.

The density difference between each third step amounts to 0.3, the ratio of the transparency of the first to the fourth step, the second to the fifth step, the fourth to the seventh step, etc., has the value 2. The apparatus (Zeiss Ikon) which is employed for making the ex-

posures has been described by Gothel and Seifert and is shown in Fig. 3.

3. The sensitivity is characterized by that energy for square cm. of emulsion surface, which is required to produce a density of 0.1 above fog. For the determination of this energy, it is not necessary to plot the density curve as in the case of the Hurter and Driffield method of evaluation; instead, one proceeds by laying a comparison strip of density 0.1 on the unexposed part of the sensitometric strip (image of the gray step wedge) and places it optically adjacent to the density scale. The number of the step which has the same den-

sity as the fog plus the comparison density, characterizes the sensitivity and gives the DIN-Speed of the photographic emulsion considered. Bringing the two densities optically adjacent may be accomplished with the help of a biprism. The higher the number read, the higher the sensitivity of the emulsion and indeed a jump of three step numbers designates a rise by a factor of 2 in sensitivity. The choice of the density 0.1 above fog has various bases. A specification of sensitivity based on this value of density has regard for the rendering of shadow detail, which is absolutely necessary for the attainment of pleas-



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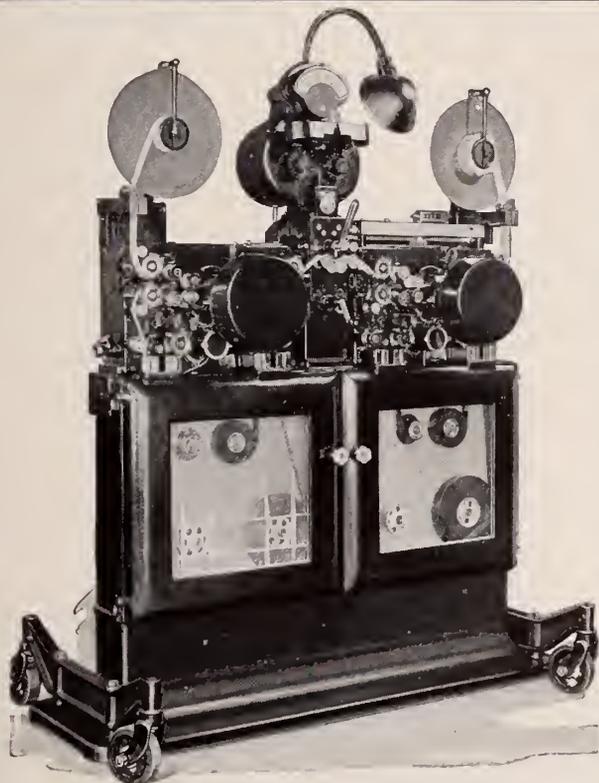
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ing pictures, while a good rendering of the mean tones and high lights can be obtained through proper choice of the printing materials. In addition, extensive research, which has been carried out, especially in Dresden, shows that the differences in sensitivity of the emulsions which are available for practical photography can be quantitatively represented by the DIN-scale. A very important advantage of the method outlined consists in the fact that by this method the eye is not employed as an "absolute instrument" for the observation of a threshold value, but as a "null instrument" in which it has the task merely of observing the equality between densities. Hereby individual differences should be largely eliminated.

In contrast to all former systems of sensitometry, the method of development of the sensitometric strip is here accurately specified. The developer is sulphite metol-hydrochinon developer and optimal development is to be given,

i.e. development for such a time that the highest possible DIN-number is obtained. However, the density of the fog is not to be higher than 0.4 in case it is not specified under the DIN-Speed by the factory.

The sensitivity of a photographic emulsion can be accurately determined to \pm DIN-number. In order to furnish latitude for a small loss of sensitivity of an emulsion during storage, a tolerance of 3 DIN-steps has been established, i.e. for a later test it is permitted that the sensitivity be (at the most) 3 steps-DIN lower than it was given by the factory. An arbitrary sensitivity change (to one-half) is insignificant in comparison with the enormous exposure latitude of many modern photographic emulsions.

The problem of DIN-speed, as well as a trustworthy sensitivity designated for photographic emulsions, has long been desired. This must be seen as a real and, for the practical photographer, very delightful advancement.

PHOTOGRAPHY OF THE MONTH

Continued from Page 10

"NIGHT LIFE OF THE GODS" (Universal)

John Mescall, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 7, 1934): "The photography is fair."
Daily Variety (December 7, 1934): "Photography of John Mescall is excellent, particularly the process footage of the transformations."

"MYSTERY WOMAN" (Fox)

Ernest Palmer, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 7, 1934): "Ernest Palmer's photography is at all times interesting."
Daily Variety (December 7, 1934): "Photography is excellent, particularly night shots at sea."

"LITTLE MEN" (Mascot)

Ernest Miller, A.S.C.: Directing Cinematographer
Daily Variety (December 7, 1934): "Photography by Ernie Miller and William Nobles is excellent."

"BIOGRAPHY OF A BACHELOR GIRL" (M-G-M)

James Wong Howe, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 15, 1934): "And James Wong Howe succeeds in making things look their best with his photography."
Daily Variety (December 15, 1934): "Photography of James Wong Howe is above par, particularly his exteriors."

CRONJAGER PASSES

Jules Cronjager, 62, veteran cinematographer, died at his home Christmas night following a heart attack after being ill for several weeks.
Cronjager had been a cameraman for 25 years. He is credited with some of the big productions of the industry during the silent days. He is survived by his widow and a brother Henry. Edward Cronjager, A.S.C., of the RKO Studio, is his nephew.

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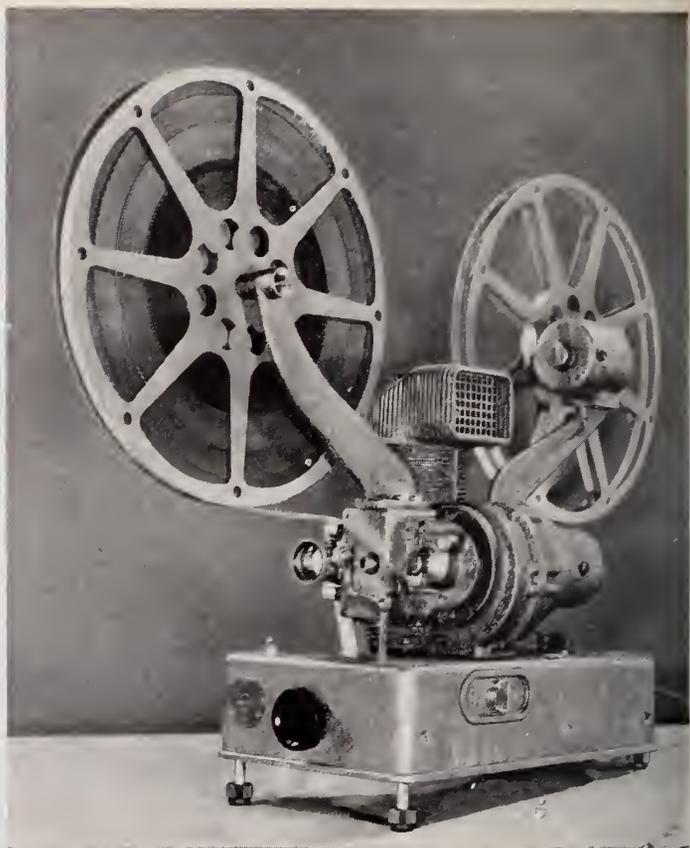


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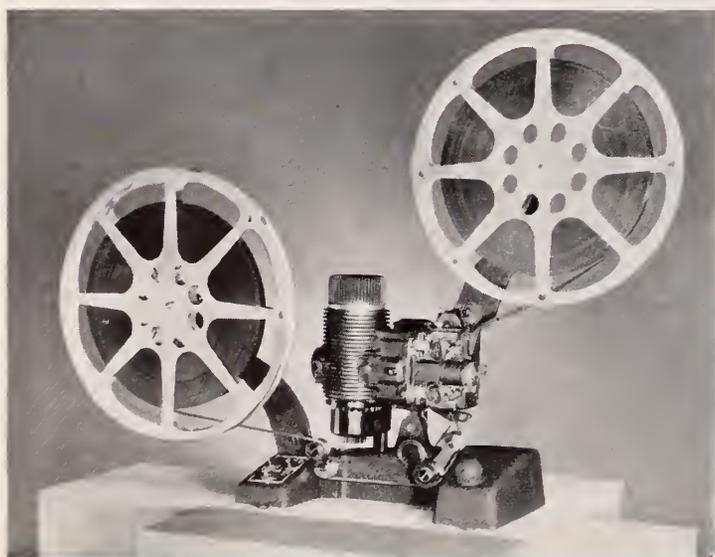
Film conditioning, by travel through a channel where the film is cooled and humidified.

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AMATEUR MOVIE SECTION

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Next Month . . .

- We will give you the details of the 1935 Amateur Movie competition. There will be a little change in the date and a little change in the classifications. Everything will be simplified more.
- There will be articles pertinent to problems you encounter frequently. We will tell you something more about animated cartooning and how sound is synchronized with the action.

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Equipment Prizes Awarded

DURING the past month the judging committee of the American Cinematographer 1934 Amateur Movie Makers Contest completed its work and designated the winners of the equipment prizes and those who were to receive Honorable Mention.

The prize given by Eastman was awarded Jahn E. Earl for his picture "The Traveler." This picture was selected because it was felt by the committee that it not only was a good travel subject, but also one that had as its central theme the family of the producer.

The Bell & Howell prizes according to the rules went to the winners of prizes in the cash awards to those who used Bell & Howell cameras.

The Victor Animatograph Camera was given outside of the regular awards. In every case where this was possible the committee attempted to separate the equipment awards from the cash awards. "Footsteps" would easily have won in one of the classifications, but the picture was of a calibre that the committee believed should receive a higher award.

The Agfa contributions were also rated in the same way. If the picture was made on Agfa film it was first put in the class to be judged for the Agfa prize as that prize was greater than the cash prize except in the case of the first winner. Under this arrangement Mr. Nixon of Cleveland, Ohio, was given the prize of the Super Pan film for his fine picture "Christmas." This combined fine photography, both interior and exterior, with a splendid record of the holidays. In view of the fact that the Calvin Co. award came under this same classification Mr. Nixon also won that prize.

The second prize of the Agfa Ansco Corp. went to Arthur Walff of Chicago for his film "All for Beauty," a documentary picture.

The Harrison & Harrison prize was awarded to Chas. E. Coles and Robert Coles of New York City for their picture "Rainbow Trail." Last year these two gentlemen won the second prize for photography.

The Craig Splicer and Rewind went to W. McFarlane of Rochester for his picture "Two Tramps Abroad," a splendid record of a honeymoon trip cleverly edited and titled.

The Sunny Schick prize of one Madel M.S.A. Electrophot went to J. J. Urban of Ft. Atkinson, Wis., for his picture "Our Family."

In addition to these prizes the committee felt that the following were highly deserving of Honorable Mention:

Allan F. Seaver, New Bedford, Mass., for his picture "New York City."

Equipment Winners

Eastman Madel K-75 Projector, Value \$235.00, to Jahn E. Earl, for his picture "The Traveler."

BELL & HOWELL, Merchandise to the value of \$125.00 to Van Dee Sickler for his picture "Mischief."

Bell & Howell, Merchandise to the value of \$75.00 to H. Demarest of Hackensack, N. J., for his picture "Story of Water."

Victor Animatograph Corp., Model 5, 16mm Camera with f2.9 lens, value \$175.00, to J. R. Coming, St. Louis, Mo., for his picture "Footsteps."

Harrison & Harrison Universal Filter Halder and set of Multi Filters, value \$14.00, to Chas. H. Coles and Robert Coles, New York City, for "Rainbow Trail."

Craig Movie Supply Co., Senior Rewind and Splicer, value \$19.50, to Jahn W. McFarlane, Rochester, N. Y., for "Two Tramps Abroad."

Agfa Ansco Corp., 12 one-hundred-foot rolls Super Pan Reversible 16mm film, value \$94.00, to C. E. Nixon, Cleveland, Ohio, for "Christmas."

Agfa Ansco Corp., 12 one-hundred-foot rolls Plenachrome Reversible Film, value \$54.00, to Arthur Walff, Chicago, Ill., for his picture "All for Beauty."

The Calvin Co., Complete Set of Tailor Made Titles, value \$50.00, to C. E. Nixon, Cleveland, Ohio, for "Christmas."

Sunny Schick, one Madel M.S.A. Electrophot, value \$17.50, to J. J. Urban, Ft. Atkinson, Wis., for "Our Family."

Dr. Harold F. Kaufman, San Francisco, Calif., for his picture "Around the Clock with Muriel."

C. J. Kostich, Long Island City, N. Y., for his picture "Peosonts."

Dr. S. H. McAfee, New Orleans, La., for his dental picture.

Delmir DeCaralt of Barcelona, Spain, for his picture "Memmartigo."

Claude W. A. Codarette, Los Angeles, Calif., for his picture "California Missions," on 8mm subject.

Cinema Club of San Francisco for their picture "Shades of Bacchus."

Joyn F. Criswell of Las Angeles for his picture "America Thru the Ages."

M. P. Gamber, Grand Rapids, Mich., for his 8mm picture "Haaked."

Non-Sync Setup for Silent Pictures

by
Arthur H. Smith



The dual turntable case, showing the input A. C., the two output jacks and patching cords. The two off-on switches, two control switches and the fader. The pickups and motor turntables are mounted on the top.

THE following describes a "non-sync" setup which is portable and which incorporates a monitoring circuit and a feature whereby sound effects may be simultaneous with the background music. This arrangement is built into two cases for ease in transporting and is very convenient for temporary setups.

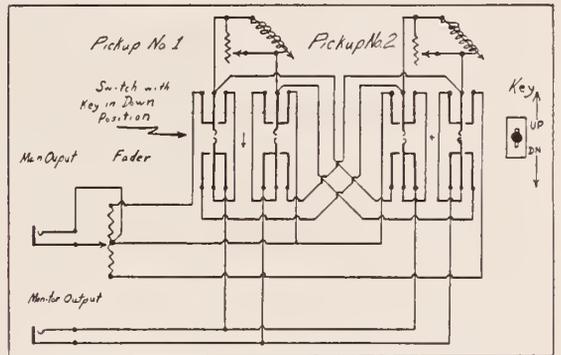
Two plywood suitcases about 24"x15" are used to house the complete setup. The first case contains two 33 1/3-78 r.p.m. electric turntables, two electric pickups and the associated wiring. The second case contains the amplifier. This amplifier is really two amplifiers. The first, or main amplifier, is for the sound and the second is the monitor amplifier.

The operator, at times, wishes to pick out sections of a record for accompaniment with the picture. In this system I have provided a means whereby the operator may monitor on the incoming pickup with a pair of headphones and find the exact spot for setting his needle. For instance the action might be slow and light, then a fadeout and a quick fadein on fast exciting action. One record may have fast exciting music about halfway in it. Yet, the operator will not wish to play the first part of this record as a better record may be on hand for the slow action preceding the excitement. So, he plays the slow music, sets the incoming pickup about where he wishes to pick up the hurry-hurry and listens for the start and then fades over to catch the opening notes.

Two outlet jacks and a 11°V. A.C. input are mounted on one end of the turntable case. One output jack is connected by means of a patching cord to the input of the main amplifier and the other output jack is connected by means of a second patching cord to the monitor amplifier. The input for the 11°V. A.C. is an ordinary outlet receptacle and a special cord is made up with two male plugs for connecting to a power outlet. Each motor has its own on-off switch. Each pickup comes with a volume control as part of the pickup assembled in one unit. Therefore, no volume controls need be mounted on the case. However, for each pickup circuit there is a four-pole three-position switch. For this switching arrangement a Kellogg anti-capacity switch may be used, but, a slight adjustment will have to be made on the inner contacts. These must be bent so as to contact with the swing arms when the key is in the center position. The diagram of the turntable case shows such a position on the right hand pickup while the left hand pickup in the diagram has the key in the down position.

Here is an explanation of operation.

The amplifier and speaker are set up, and the dual turntable case is connected with the patching cords. With



Wiring Diagram for Dual Turntable.

the key associated with its particular pickup in the down position that pickup is on the main amplifier channel and will feed music into said channel provided the fader is turned to that pickup. With the key in the center position the pickup is on the monitor channel and can be heard in the headphones. With the key operated up it throws the pickup in parallel with the playing pickup. This is used in the following case. The action on the screen shows a train thundering along a track. Background music is being played. Now, as special records may be secured for almost any type of sound we will say a record has been secured for a train whistle. That is put on the vacant turntable and the motor started. Now at the critical moment the key is thrown up and through the background music will come the "toot-toot" of the train whistle.

The amplifier is built into one chassis. It is mounted in the cover of the second case and the loud speaker is mounted in the base. It will be necessary to remove the hinges and replace them with clasps similar to those on the front of the suitcase. These may be obtained in a suitcase repair shop. Then, the speaker may be detached and placed near the screen.

The main amplifier consists of 2-56's into 47's in push-pull and the 80 rectifier. The monitor amplifier is a single 56 into a single 45 with its 80 tube. The monitor amplifier also supplies field to the dynamic speaker. Of course, variations can be used. The main thing is to supply two amplifier channels so that one amplifier channel is available for the sound while a second channel is available for monitoring. If an A.C. speaker is used then of course it is unnecessary to supply field from the monitor amplifier.

If it is desired a microphone may be fed into the input of the amplifier for explanations during the picture. A mike transformer and battery is all that is necessary and this may be built into a small box which will fit into the amplifier-speaker case when transporting.

Music with pictures improves their entertainment value about 50%.

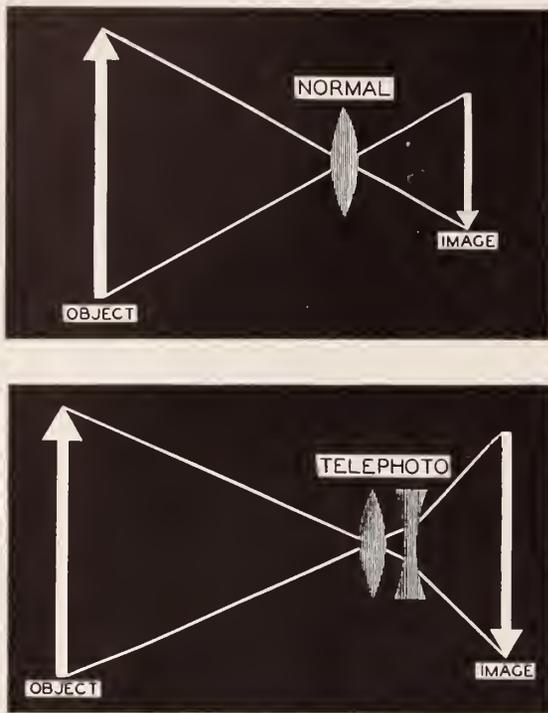


Figure 9. By combining a dispersing lens with a converging lens, the telephoto effect of enlarging the image is obtained without correspondingly longer mounting length and large diameter required by a normal long-focus lens.

IN THE first two articles of this series in which we have become better acquainted with the whys and wherefores of our camera lenses, the rudimentary optical faults of the single common lens have been discussed with the idea of realizing more fully why the lens of our cameras is so important to the quality of our picture work. And, altho intricate mathematics was purposely avoided, the discussion at least, I trust, has made us aware of the problems confronting lens designers and manufacturers, and perhaps their ceaseless efforts to supply us movie fans with better and better lens equipment have increased our respect for their talents.

The third article of the series (which appeared in last month's AMERICAN CINEMATOGRAPHER) was an attempt to learn, in at least cursory fashion, the progress which has been made in modern lenses, with illustrations of the general types of modern anastigmats. In order to correct for as many optical faults as possible simultaneously, groups of lens elements were combined in proper manner, to be followed by later advances which increased the speed of lenses without increasing the aberrations by the simple expedient of selecting glasses and shapes which minimized the number of lens elements and thus increased the optical efficiency.

This month we shall discuss in more particular fashion two special members of the lens family—the wide angle and the telephoto lens.

When the gasoline-powered conveyance was first marketed, it was offered in only one body style, the two-seat open model. It was the plaything of the rich and nothing more. With the spread over the country of such a convenient mode of transportation, people not-so-rich visualized the motor car as having possibilities in other directions than the mere Sunday-promenading of the first models. The salesman who seldom had a passenger found a roadster or single-seat model more easily maneuvered because of its smaller size. Families in wet or cold weather began

Let's Talk

to demand more comfort in their transportation. Trucking companies realized that different models of the motor car might be built to more economically and more quickly carry heavy burdens of freight than the horse-drawn vehicle could accommodate. In short, the more general and widespread the knowledge of the advantages of motor transportation, the more widely varied became the models of the motor car.

The amateur motion camera and its lens are paralleling the history of the motor car in that as more and more enthusiasts are recruited into the field, the more widely varied are the models of cameras and lenses which manufacturers offer. Up to a certain point in this evolution, there is a great deal of healthy competition, but beyond a certain saturation point, there will be the reverse swing to simplicity.

Just at present, there are so many different focal length lenses on the market that there is actually sales resistance to all cine amateur equipment. Perhaps I should modify or qualify that statement by the explanation that because so little is told of the reasons for the existence of all these lenses, there is a definite reaction against getting into the game because "it's a rich man's game."

But we don't shy away from owning a modest automobile just because the rich man's equipage consists of a town car, a country car, and a few incidental pieces of motoring equipment do we? We might have a longing for a better car, but you can bet your last bottle of film cement that we feel that should we ever be fortunate enough to be financially able to possess more motor equipment, we'll know exactly what we need.

So it is with lens equipment for our amateur movie camera. Until we know more about our possible future needs, we start out with a normal focal length lens, a good, safe choice. But as we aren't ever satisfied with our past and present achievements, it will be a good idea to store away knowledge of what we might need in the future.

And that brings us to wide-angle lenses and telephotos. What are they? Why are they? What good can they do us? If we approach a case full of lenses with itching fingers and loose-stringed pocketbook, let's ask three questions of every lens the dealer shows us, and then blame no one but ourselves if the wrong choice is made in auxiliary lens equipment.

What is a wide-angle lens? Why is it offered to us? What good would a wide-angle lens in our camera be to better filming?

In the first place, a wide-angle lens is a lens which gathers optical impressions for our film in a wider sweep than does our normal lens. A wide-angle lens is offered to us because in interior filming so many amateurs have complained of the regular lens being too "narrow-eyed" to include enough scene taken in our small-roomed modern homes and apartments. If we have a wide-angle lens in our equipment, we can film family movies indoors and

About Lenses Wide-Angles and Telephotos

by
Wm. J. Grace

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get plenty of adjacent scenery to establish the fact that it is really a room and not just a two-walled artificial movie set.

The diagonal of a frame of 16mm film is about $\frac{1}{2}$ ". With a 1" lens (sometimes called a 25mm lens), then, the included angle is about $26\frac{1}{2}^\circ$. If you're mathematically inclined, the angle is the anti-tan of half the diagonal divided by the focal length. Consequently, a 15mm wide-angle lens will cover about 33° on the diagonal (again, the anti-tan of half the diagonal divided by the focal length). It isn't difficult mathematics to prove that 33° is about 25% wider angle than $26\frac{1}{2}^\circ$, and it likewise isn't difficult for the layman to realize that a picture made with a 15mm wide-angle lens will include 25% more scenery all around than the normal 1" lens.

Why aren't still wider-angle lenses on the market? Simply because the need hasn't developed to such proportions as to warrant paying the salary of a high-priced lens designer or investing in optical grinding equipment necessary to such short focal lengths. When the need becomes great enough, we shall have wider-angle lenses, have no fear. True, the focal length will be so short that the lens may practically ride on the film, but if we want them, lens makers will come thru in fine style, never fear!

As an example of what has actually been done in the way of wide-angle lenses, the Goerz Optical Co. developed a few years ago a lens which was anastigmatically flattened over a field of about 135° ! But the Hypergon, as it was trade-named, was not for the 16mm enthusiast, for it overcame the uneven illumination of the film surface (a fault common to wide-angle lenses, but, of course, corrected in commercial lenses) by the complicated expedient of exposing with the film for about $\frac{1}{6}$ total time with the lens alone, and the remaining $\frac{5}{6}$ was exposed with a star-shaped auxiliary field stop, which was spun in front of the lens by an air blast, swung before the lens. Imagine doing this 16 times per second! One would have to be a bit agile, as it were, would one not!

You wide-angle fans who have been crying for "wider, wider, wider" angles to your lenses, digest the above description of a really wide-angle lens, and be content with what you have.

And now to the other side of the normal lens—the telephoto lens. What is a telephoto lens? Why is it offered to us? What improvement would come to our filming thru the use of telephoto lenses?

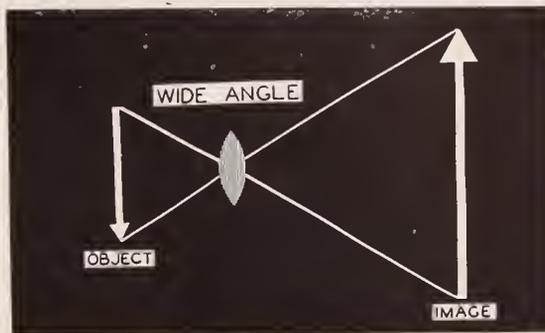
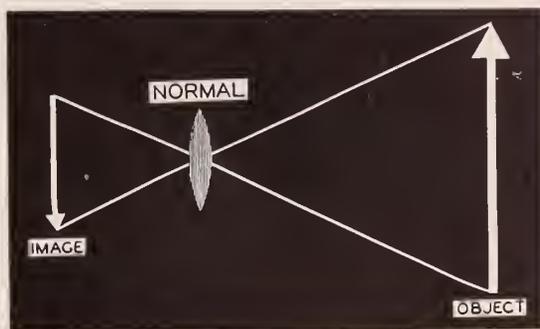


Figure 8. The wide-angle lens "takes in" a wider angle of view than the normal lens. Its chief use is in filming interiors where the camera cannot be backed far enough away from the scene to include the proper amount of surroundings.

Well, a telephoto lens is a hybrid lens, in the first place. It's a long focal length lens with a short focal length mounting tube. It is existent only because we have demanded that even long focus lenses for our tiny amateur movie cameras must be in keeping with the physical dimensions of our compact cameras. Surely, they cost more than a regular lens would cost, because of the extra lens element in it. It is an important lens for us, tho, because it allows us to film objects in a larger size than if we had to depend on the normal lens, from the same camera-object distance.

If you are a still camera enthusiast as well as a movie bug, as most of us in 16 and 8 are, you are familiar with the rather large backward and forward travel of the lens of, say, a $2\frac{1}{4} \times 3\frac{1}{4}$ " Graflex having the normal $5\frac{1}{2}$ " lens. Your own camera may be smaller or larger than this and have a correspondingly shorter or longer focus lens, but you do know that the lens on your still camera must travel an appreciably longer distance in moving from perfect focus for a close-up to sharp focus for a distant scene.

As an example, the $5\frac{1}{2}$ " lens of my Graflex moves about 5" between the extremes of a closeup and a distant object, while my 6" telephoto on my Bell & Howell only moves about $\frac{5}{16}$ " for the same adjustment. Moreover, when racked out to shoot a closeup, the $5\frac{1}{2}$ " Graflex lens is about 10" or more away from the film, while the 6" Cooke telephoto is only about 4" away.

The short mounting of a telephoto lens not only is a boon to the amateur cinephotographer because of compactness, but it does not unbalance the camera as much as would a normal lens of the same focal length. The longer the focal length of a small cine camera lens, the more highly is magnified any slight movement of either the lens or the camera, and if the barrel of the lens is kept short, as is possible with telephotos, there is less danger from lens movement to spoil the shot.

Formula for Reversing Films

Editor's Note: So many requests have reached us for a formula for reversing 16mm film that we are reprinting herewith the article as it was originally printed in the *Cinematographic Annual* Vol. 2.

THE making of direct positives, whether by the reversol-film process generally used by amateurs, or by converting an ordinary negative into a positive, consists in making a negative on a strip of film, developing it, and then printing that negative on the same strip and destroying the original negative chemically, but leaving the positive print to be developed, etc., in the usual way.

In 35mm use, where regular reversol film is not available, either negative or positive film may be used, but where the light permits, positive is preferable, as it gives snappier results, although it is not corrected for color-values. As positive stock is for slower than negative, it can only be used under the best light conditions, and always with a much wider diaphragm opening than would be used with negative. It is not recommended for interiors. In any case, the exposure must be rather full.

The apparatus needed is a SOLID drum of metal or wood, painted with a dead black photographic enamel which must be resistant to the action of photographic chemicals. A SKELETON-TYPE DRUM, WITH ONLY RIBS, CANNOT BE USED FOR REVERSAL PROCESSING.

Any high-contrast developer can be used. The following is a good formula:

HYDROQUINONE	1 ounce
Sodium Sulphite (dry)	11 ounces
Sodium Carbonate (dry)	7 ounces
Potassium Bromide.....	1 ounce
Water	1 gallon
Alcohol	1 pint

The alcohol may be omitted, but permits development at a higher temperature, giving greater contrast.

Development should be slow, by dim, red light, so as to give a snappy negative with pure whites and deep blacks. Be sure to develop fully.

Wash for five minutes or more, to remove all traces of developer.

At this stage, any swelling of the film should be taken up by tightening the film on the drum. Then the film should be exposed to a diffused, white light until the white portions of the film become visibly grayed.

The next step is to destroy the negative image by immersion in:

Water	1 gallon
Potassium Bichromate	1 1/2 ounces
Nitric Acid.....	3 ounces

The film is immersed in this both until the negative has entirely disappeared, and only the creamy white of the remaining, undeveloped silver bromide is visible. After this, the film must be thoroughly washed, and the final, positive image then developed in the usual manner. This may be done in the same solution in which the negative was developed, or in some softer-working solution.

After this development, the print is fixed and washed in the usual manner.

Another set of formulae, especially intended for substandard reversol emulsions, one recommended by Messrs. Pathe for use with their Pathe system.

The formula for the first development is:

Porophenylenediamine	150 grains
Sodium Sulphite (crystals).....	1 ounce
Caustic Soda	150 grains
Potassium Bromide.....	60 grains
Phenosafronine (solution 1:1000).....	160 minims
Water	35 ounces

If ANHYDROUS sulphite is used, only 1/2 ounce is needed. There are also several commercial desensitizers, such as "Desensol," etc., which can be readily substituted for the safranin solution required.

This developer must be used at temperatures between 60 and 65 degrees F.

The developer should be filtered before use. Remember, too, that the caustic soda is bad for the eyes, so do not splash the developer.

In developing reversal film, the film should look almost opaque when the development is finished, and the black portions of the negative should appear of almost equal density from either side of the film. The following table will be useful in timing the development:

If the First Signs of Image Appear in:	Develop for
Up to 20 seconds	5 to 8 minutes
30 "	10 "
40 "	12 "
1 minute	15 "
1 1/4 to 1 1/2 minutes	20 to 25 "

Reversion is in this case carried out chemically, by use of the following reversion bath:

Potassium Permanganate.....	30 grains
Sulphuric Acid.....	170 minims
Water	35 ounces

The acid should be added last in a slow stream, stirring the while. Sodium Bisulphate (380 grains) may be substituted for the acid, but is not so effective.

In reversion the negative is dissolved away and the film takes on a red color. This normally takes from seven to ten minutes, but should in any case be continued until all of the black image is dissolved. If the amateur has both orange and red lights on his dark-room lamp, the red one may be removed after the film has been five minutes in this bath.

After reversion the film is washed until it becomes a clear yellow—usually about seven minutes. The remaining operations may be carried out in white lights.

The next step is bleaching, by the following formula:

Sodium Sulphite (crystals).....	150 grains
Sulphuric Acid	35 minims
Water	35 ounces

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Adapting Professional Lighting to Amateur Movies

by

Frank Good, A. S. C.

THERE is no gainsaying the fact that the average amateur-movie interior is either too flat, or too excessively contrasty. The fault, in the first instance, is that a general flood of light (from one or more sources) is indiscriminately thrown on the set—with no accentuating shadows or high-lights. In the other case, the light is from a single source, as a rule, so placed as to "burn up" most of the high-lights, and leaving a lot of heavy, black shadows.

Now, how shall we correct this? In the first place, why not begin with a general illumination from two or three well-placed lamps, fitted with silk or tracing-cloth diffusers. This is good insurance against unpleasant shadows; but it won't, naturally, give you anything but a flat, well-illuminated picture. If we want character in it, we will have to build up our high-lights from this foundation.

This is a good start; but now, how about the high-lights and shadows that will give our set character? These can come from other units—not diffused—and placed here and there about the room where their beams will make little catch-lights on irregular wall-surfaces, curtains, archways, and furniture. The various types of inexpensive Photoflood units are fine for this. The light-source in a Photoflood bulb is fairly small, and so the light is intense enough to give a strong beam, which will accentuate our high-lights nicely, and also cast interesting shadows. In addition, Photofloods placed in ordinary table or bridge lamps will add to the naturalness of the effect, putting more highly-illuminated splashes of light in the logical places.

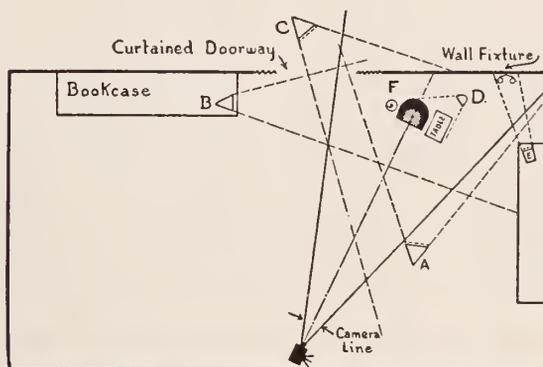
Clearly, if we build our light up this way, we're likely to get so much more than merely enough illumination to make an exposure, that we'll have to stop down quite a bit. Well, why not? Stopping down will give us more depth of focus—and it will also allow us to control the effect we get; closing down will give a darker, more contrasty picture, while opening up will give us a lighter, softer one. The best guide, of course, is an accurate exposure-meter (preferably one of the photoelectric type): normally,

follow its reading; but for effects, note the reading, and then modify your exposure to get your effect.

Now let's consider on actual example, and see what can be done under normal conditions. Take the room represented in the sketch—a living-room of average size. Our shot will be made with a 15mm lens, centering on a person seated in a chair, and including a corner of the room. (It is always better to show two of the walls of a room this way, rather than a single wall.) Beside our chair are a book-table, on one side, and a reading-lamp on the other. Now, let's begin to light our picture! What do we want first? Our foundation-light: the soft, general illumination, from which we can build up our high-lights. We will start with lamp "A"—a 500-watt photographic lamp, fitted with a diffuser. Placed as it is, it will give us a nice, soft, general illumination over the picture-area. Used alone, it would give us an even, general illumination sufficient for an exposure—but the picture would be flat and uninteresting. You could balance it, of course, with another, similar unit placed on the other side of the camera-line, and a bit closer to the subject: this would result in a fairly good, ordinary lighting on subject and background. But, if you're like most amateurs, with none too many lamps at your disposal, I think you could get a better lighting for your set with but a single front-light unit.

Now, what do we want next? Well, some high-lights along the folds of that curtain in the background would

Continued on Page 33



Above—How the Amateur can do it. Below—How the Professional does it: how Ernest Palmer, A.S.C., set the lights for a scene from "Cavalcade."



WHEELS OF INDUSTRY

Craig Moves

● Craig Movie Supply Company announce the removal of their offices on January 1st to 1053 S. Olive St., Los Angeles, Calif.

This is almost next door to the local Agfa offices. The new and larger quarters were made necessary by the many new pieces of equipment and material that are being handled by this company. In addition to home movie materials the Craig company is also handling still-picture equipment.

Boulder Dam Films

● The Boulder Dam Service Bureau of Boulder City, Nev., announces six subjects available of this project. Some are in 16mm and some in 35mm.

In addition to film the company also has lantern slides of the building of this vast dam.

The 16mm subjects range in length from 100 feet to 2,400 feet.

Changes Name

● Educational Projecto Film Co. of Hollywood has changed the name to Camera Mart. This company has also moved from its former location on Cahuenga to 1611 N. Cahuenga Boulevard.

Agfa Color for Rolleiflex

● According to an announcement from Burleigh Brooks, distributor of the Rolleiflex camera for America the new Agfa Color will be available for that camera about the first of January, 1935. Announcement would indicate that this process is developed to such a point that it is much faster and much easier to use.

Single Exposure Device

● A new accessory for the Leica camera is announced by E. Leitz, Inc. The Single Exposure Film Holder is a thin metal device which holds a strip of standard 35-mm film of from two to three inches long. This carrier slips into the regular

Leica camera and makes possible the exposing of a single negative.

To make single exposures in this manner, the camera is of course loaded and unloaded in a darkroom, and the device is intended primarily for testing purposes, which it serves admirably well.

This single exposure apparatus is not to be confused with the "Oligo" Single Exposure Camera, which is a complete camera in itself. The device is for use in any standard model Leica camera.

Kodak Retina

● This tiny newcomer in the miniature field takes thirty-six pictures on a roll of film supplied in a daylight-loading



magazine. Two emulsions are available: Kodak "SS" Panchromatic Film (No. SS135) and Kodak Ponatomic Film (No. F135). The actual picture size is 24x36 mm.

Loaded as easily as a Brownie, Kodak Retina carries all of its controls within easy finger-tip range. Two large knurled knobs facilitate the winding and re-winding of the film. The film is always locked in position. At a turn of the conveniently located film-release knob only enough film for the next exposure can be wound forward, when it again automatically locks. This eliminates any chance of overlapping, resulting in wasted film. Once set at the first exposure, the succeeding exposures, up to 36, are automatically shown on a dial. In a split second the picture taker is ready for the next exposure. This speed in operation is invaluable when and if it is necessary to take a series of pictures of moving subjects.

The film is numbered from 1 to 36 and when developed the number of each picture appears on the margin of the Kodak Panatomic or "SS" Panchromatic Film loaded in the new Kodak film magazine. This new feature enables the user to order prints and enlargements for his film strip by number.

With eight speeds, including 1/300 second, time and bulb action, the well-known Compur shutter is capable of handling almost any subject.

The shutter versatility is matched by the speed of the f.3.5 anastigmat lens. When the Retina is closed it affords complete protection to the lens.

Two Kodak Portrait Attachments and three color filters are available. The "A" portrait attachment, with distance set at "infinity," reduces the focal distance to 41 inches; "B" reduces it to 25 inches. When the camera is focused at 3½ feet these distances are reduced to 21 inches and 16 inches, respectively.

The three color filters are: light yellow (N-1), medium yellow (N-2), and green (N-3), with filter factors under daylight of 1.6, 1.9 and 2.2 respectively.

Filters and portrait attachments screw into the lens mount and are so compact that the camera can be shut with either—but not with both—in position. Filter and portrait attachment may be used together when the camera is open.

The retail price of the Kodak Retina is \$52.50.

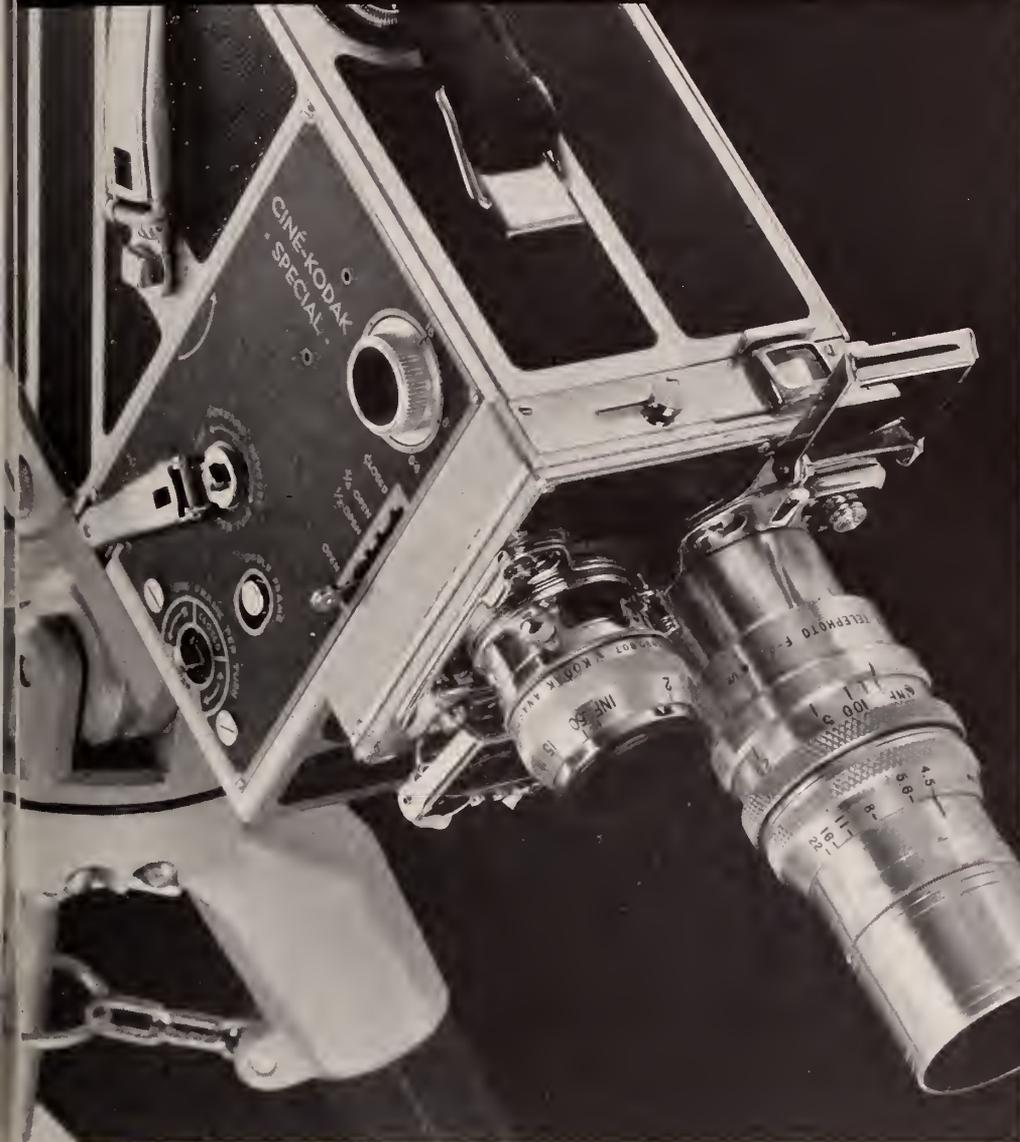
New 16mm Film Reel

● Herman A. DeVry Inc. announce a new 1600-ft. 16mm reel. The rims and spokes of this reel are of spring steel bands, bending easily but instantly returning to their original alignment. The spokes are riveted to the rims, but at the hub they slide under a steel band to allow for the molecular expansion which metal suffers when bent or subjected to any violent strain.

Another innovation is a well in the top of the hub to hold the film in the reel when starting the rewind. The film is laid over the well and pressed lightly with the finger; film perforations catch on prongs and hold the film securely until end of run.

Continued on Page 37

Admittedly...the Pick of the 16mm. Field
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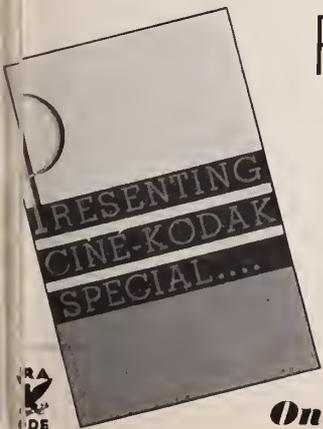
Slow motion

Animation

... slipping mask into position between lens and film

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HERE'S HOW

by A. S. C. Members

HOW can I hyper-sensitize film for use in my miniature camera?
—A. R., Rangoon, India.

For those who wish to hyper-sensitize film for greater speed, the following process may be employed:

The strongest form of commercial ammonia should be used. This is 28%. The bathing of the film must be done in total darkness and in a clean room free from dust. A **clean** miniature film developing tank is suggested for convenience. Use one part of ammonia to twenty-four parts of water and be sure that the solution is kept at 50 degrees F. Pour the solution in the tank and agitate gently for one minute. Care must be taken to prevent the formation of air bubbles on the film. Transfer film to a bath of equal parts of water and grain alcohol. This is to facilitate drying. Dry quickly in front of an electric fan, being careful to avoid dust. The film should be used as soon as possible.

—Clarence Slifer, A.S.C.

WHAT developing formula would you suggest to secure maximum density with miniature camera negatives?

—A. R. C., New York City.

The D82 formula for maximum density development is as follows:

Water (125 degrees F.)	.....24 ozs.
Wood Alcohol	.....1 1/2 ozs.
Elon	.....200 grs.
Sodium Sulphite (desiccated)	.....1 3/4 ozs.
Hydroquinone	.....200 grs.
Sodium Hydroxide	.....125 grs.
Potassium Bromide	.....125 grs.
Water to	.....32 ozs.

Developing time is four to five minutes at 65 degrees F.

If the solution is diluted and the wood alcohol left out, it will lose its developing energy.

—Clarence Slifer, A.S.C.

WHAT would you consider the slowest shutter speed with a hand-held camera?

—A. M., St. Louis, Mo.

While it was suggested that 1/20th second be considered as the slowest shut-

ter speed that may be safely used with the hand-held camera, it was not meant to discourage you from using slower exposures. They may be used, when it is the question of a fair picture or no picture at all. With my model F Leica, I have made many satisfactory hand-held exposures up to one second in duration. However, the greatest care must be exercised. An extremely valuable aid for slow exposures is the Grace Beltipod (a unipod camera support that slips over the belt or overcoat button). Such a support facilitates the using of slower or longer focal length lenses for night photography. Just imagine the exposure and photographic possibilities obtainable with an f2.0 lens and one second exposure.

—C. W. D. Slifer, A.S.C.

IS IT possible to print 16mm negative on 35mm positive stock, that is, enlarge 16mm to 35mm? Would this procedure cause the grain to become coarse? Is there any fine grain developer that would overcome this difficulty?

—L. G., Chicago, Ill.

While it is physically possible to enlarge 16mm to 35mm it is not considered practicable because of the coarseness of the grain. This has been done on several occasions when no other type of negative or print was available. At the time of the Lindbergh kidnapping the prints of the Lindbergh baby shown in the newsreels were enlargements of 16mm pictures made by the Colonel of his baby.

The present newsreel shots of the Galapagos Island mystery showing some of the people who are down there are seemingly enlargements of 16mm. It is a well-known fact that G. Allan Hancock, the scientist who is familiar with these islands and who has cruised them frequently, has taken many 16mm pictures of them and the people on them. In recent news reels he is given credit for the pictures of the islands and the people on them. It is possible that these pictures were also enlargements of 16mm. At least they have every evidence of being dupes or enlargements.

—Ray Fernstrom, A.S.C.

SOMETIMES in close shots, I find that although I carefully

frame my shots in the finder, on the screen the subjects often have the tops of their heads cut off. Why is this?

—W. L. D., Cambridge, Mass.

This is caused by what is known as parallax between the finder and the lens. Obviously, your finder is on top of the camera; when you get close to your subject, the finder and the lens do not cover exactly the same field, due to the distance between the finder and lens. Most modern cameras have an adjustment on the finder—usually a means of sliding the eyepiece up to alter the finder's angle of field—to compensate for this. (If the finder is at the side of the camera, the error and adjustment are, of course, to the side.) If your camera has no such adjustment, the only thing to do is to remember whenever your subject is closer than ten feet from the camera, and sight through your finder allowing more than ample head-room at the top of your picture.

—David Abel, A.S.C.

WHY is the film for the 8mm cameras furnished in the 16mm width and slit after exposure and development? Why isn't this film furnished us already split in the 8mm width?

—S. R. C., New York City.

According to tests made by the Eastman Company it was found that the furnishing of the film split in advance would not be so practical as furnishing it in 16mm length. If you have attempted to develop motion picture film in any lengths you know it will stretch. It was found in testing film split into an 8mm width that the stretching of this film was greater than in the 16mm width, so much so that it was inclined to come off the drying drums longer than before it was processed. This would mean a lot of trouble in accurately-made projectors. It might also keep the operator busy with the framing lever attempting to keep his picture in frame. In my own experience I have found that this film will stretch a little even after it is processed because of its very narrowness. The strain in the projector and in the re-winds is to pull this film, so the tendency would be to lengthen it.

—Arthur Miller, A.S.C.

Adapting Professional Lighting to Amateur Movies

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relieve the flatness of that part of the view, so we'll place lamp "B" either on the bookcase to the left, or on a high stand near it. Lamp "B" can be either another 500-watt unit (undiffused), or a Photoflood unit. It will give us these background high-lights we want, and, if properly placed, it can also simulate the light falling on the subject from reading-lamp "F." Not being diffused, it will give us a harder, snappier light. The respective distances between the subject and lamps "A" and "B" can be balanced so as to get any desired light-balance. Bear in mind, of course, that the light from lamp "B" should naturally be a bit the more intense, as that is to be the high-light side of the picture.

Now, our picture will show a little of the room beyond; so there will have to be some light there. If you are getting enough of the room in your picture to warrant it, it might be advisable to cast some shadow-patterns on its farther wall, with Photoflood units. However, the first thought we have when we think of an illuminated room in the distance, is that some light must stream out. Therefore we take lamp "C," another 500-watt unit, and place it as shown, using a diffuser if it appears advisable. As the sketch shows, it will give us the patch of light apparently streaming out from the back room, and also a nice edge-lighting (or back-light) on the edge of the curtains.

On the wall behind the subject, there is a wall-fixture, which we will assume is fitted with ordinary, flame-tinted 25-watt globes. We can turn these on—not for actual illumination, to be sure—but for the natural effect their glow will give. To heighten this, we can place a diffused spotlight on the mantelpiece, focused on the wall-fixture, so that it gives us precisely the patch of light that such lamps cast on the wall behind them—but (thanks to the spotlight) raised to photographable intensity. Now, in reality, such a wall lamp would have an effect upon the furniture in front of it—and of course, upon the people, too. This result would be an edge-light or backlight: so we simulate this by placing a Photoflood unit—lamp "D"—in line between the chair and the wall-fixture, and in such a position that it is screened from the camera by the book-table. This will give us the effect we want—a back-light on the edges of the chair, table, and subject which will separate them from the background. Lamp "D" should be as high off the floor as is practicable, and well behind the subject. Remember, we are shooting with a 15mm lens: and at this distance our vertical field is 3.4 feet; we will naturally cut the picture some little distance from the floor. Therefore, we can, if necessary, put

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lamp "D" right on the floor, and it would probably be out of the picture: but we will get a better effect if it is raised a couple of feet from the floor, and masked by the table. If we include the legs of the table, this lamp can be placed at such an angle, that, while still doing its primary work, it will also give us a back-lit effect along these legs.

The main source of our apparent light is, of course, reading-lamp "F." We can deal with this as seems most advisable: either putting a Photoflood into it, and using it as part of our bona-fide lighting, or merely putting a moderately strong

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bulb (say 150 watts) into it, simply to suggest that it is a major light-source, and letting the actual light come from lamp "B."



TRICKS and GADGETS

• For the past two months this department was replaced by the description of the trick titler by Ed Lucas. That was a contribution by Lucas to the Tricks and Gadgets contest.

We have such a wealth of material submitted it is going to take us several months to catch up with the supply.

Film Viewer

Here's a mighty practical gadget and at the same time one that can be built by almost anyone, whether he is handy with tools or not.

It was submitted by J. D. Cochrane of North College Hill, Ohio. Cochrane tells us of other interesting things he has built, but submits his View Finder in the contest.

If you will study the photograph and little sketch as we describe this gadget we are sure you will realize that it can be built by anyone who owns a saw and a few other tools.

The first thing you will need is a light source. Cochrane used a small reading light, the type which clamps to a book. This as you know comes equipped with a reflector. If you will look at the photo you will be able to see the electric wire leading in from the right edge of the photo.

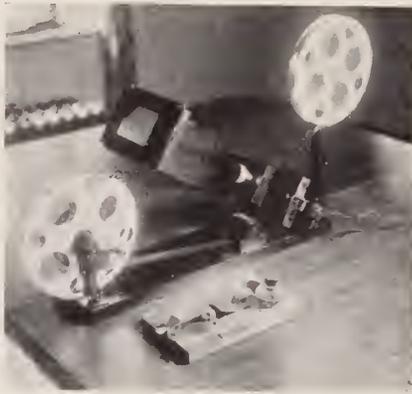
Next a condenser is necessary. If you haven't one you can purchase one from Eastman Kodak Company. Cochrane used one he had in an old Model C Kodascope. This condenser you will have to place in front of your light source, but back of your film. Look at your projector and you will see in what order these things are used. You will find a reflector, the light, a condenser, then your film gate, and then your projection lens.

Next in order Cochrane placed a piece of frosted glass to give a diffused light and also to protect the film from excessive heat coming from the light source.

A film gate was the next item in order. This you will note from the little sketch is made up of layers of polished metal, bakelite or heavy film. It is

through this gate that the film is conveyed, touching only the outer edges of the film, thereby eliminating the possibility of scratching the emulsion or film. This slide or guide will give you the desired width, you, however, will have to mask off for the height so as to take in only one frame at a time. You can build the mask from the same material you use for constructing the guide; you lay this mask, however, on top or below the guide.

Next you will need a lens. This you merely take from your projector. In other words your projector lens will live a double life. It will continue to serve



on the projector and will double on your viewer. You will have to mount this in such a way that it can be raised or lowered for focusing.

The last piece for the viewer is the frosted or ground glass on which the picture will be viewed. You will note from the picture that this was attached very simply. This glass has only one upright support, a board on the left. Cochrane did not box this in; the three sides are left open and the glass fitted on top with a frame of some sort.

So as to use this with his rewinds he built a special support for a 400-foot reel as shown on the right of the photo. In view of the fact that this support does not have to have a rewind it will not be difficult to make as it will merely be necessary to have an upright piece and a peg of some sort on which to place the reel.

The framework of the viewer is basically two pieces of board, one at the

bottom for the main support and one at the side to support the ground glass used for the screen. A simple angle-iron mounting will permit you to place this at any angle you desire. These angle-irons secured at any 5 and 10 can be bent easily.

While this is not a beautifully finished viewer, still it is practical. Care should be taken in building that portion which makes up the guide and gate and the method used to bring it toward the other rewind. The photo would indicate that Cochrane has used a roller on that side. Whether this is made up of an ordinary spool or something else is hard to determine, but it would be well to have a roller of some sort at this point, and depending upon the angle of this viewer, to have one at the other side so as not to scratch the film.

Home-Made Humidor Can

J. R. Newhart of Milwaukee writes in how he has made a humidor can from some of the old 400-foot 16mm positive cans which he had on hand. These cans are not made with humidors. Newhart secured a small supply of copper screening, the kind used on doors and windows. He selected copper as this will not rust.

Next he purchased some liquid solder. This can be secured from the 5 and 10 for 10c. In addition to this he merely needed either strong scissors or tinsnips. He tells us he bought a pair of tinsnips from the 5 and 10 for 15 cents, and that the screen wire cost him 12 cents. From this wire he made 8 humidor cans.

This was his method. He cut a piece of screening the size he wanted for the bottom of the can. He cut a piece of blotting paper smaller than this wire, then he placed the wire over the blotting paper in the bottom of the can, applied the liquid solder to the edges of the wire, and he had a humidor can.

The reason for fastening the wire was so that it would not fall out every time the can was turned over. Of course, it is not necessary to fasten this wire, it merely acts as a separator between the reel and the blotter. Also this wire can be cut oblong and fastened at each end only, so that new blotters can be placed under it from time to time.

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There is yet another possibility open to us in some cases, for getting our back-lighting—from the ostensible source of the wall-lamp. This is to hang a lighting unit, professional-style, from the moulding on the wall. It would replace lamp "D," of course, or supplement it, if we want that lamp's effect on the table-legs. It would naturally have to be inclined in such a way as to avoid directly striking the camera lens; and a deep lens-hood is always advisable when working with artificial lights. When using this method, remember that you can do a great deal with such lights which, while they may be in front of the camera, are actually out of the area being photographed.

The photographic illustration, aside from giving an idea of how professional sets are made to order for photography, and giving some hints as to this type of lighting (note the "baby" spot on the wall, in the same service as our lamp "E"), also illustrates a point we have not as yet mentioned: this is the high-lighting of the picture on the wall. You will notice, just over the portrait of Queen Victoria, a "Baby Spot" (not diffused, but well "flooded out") which is hung on the wall just outside the camera-line, so that its beam strikes down across the picture, high-lighting it and its frame—and also the door-frame beyond. This is a useful idea for emphasizing any particular feature of a room. Similar methods can easily be adapted to the individual requirements of the amateur.

Equipment Prizes Awarded

Continued from Page 24

Robert F. Gowen, Ossining, N. Y., for his picture "The Menace."

Frank Gunnell, Staten Island, New York, for his picture "From Winter Snows to Summer Sunshine."

Howard J. Hargraves, Chicago, Ill., for his picture "Dark Horizon."

Duncan Mac D. Little of New York City for his picture "Circus."

Dr. Donald H. Miller, San Leandro, Calif., for his picture "Hobby Within a Hobby."

Walter Mills, Grand Rapids, Mich., for his 8mm picture "Noon Hour."

Sylvanus F. Nye, Kenmore, New York, for his picture "Christmas 1933."

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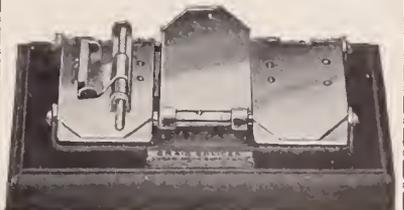
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R. F. Oden, Pasadena, Calif., for his 8mm picture "Symphony Mechanicus."

Dr. G. L. Rodenburg, New York City, for "The Butterfly."

Alvin D. Ross, New York City, for "Interlude Between Acts."

K. G. Stephens, San Francisco, Calif., for "Holiday."

Freeman F. Taylor, Llanerch, Pa., for "Zoorilla."

K. Tsukamoto, Japan, for "An Alpine Conquest."

H. W. Voss, Ft. Meyer, Fla., for "Florida Montage."

E. W. Walker, Beverly Hills, Calif., for "Death Valley."

L. Clyde Anderson, Salt Lake City, Utah., "Canyons of Romance."

W. R. Anderson, Salt Lake City, Utah, his 8mm picture "Our Family Album."

H. M. Armstrong, Cope Cottage, Me., for "The Carrying Forth of A Nation."

E. M. Barnord, Kansas City, Mo., for "Christmas, 1932."

Lawrence Legg, Council Bluffs, Ia., for "Us Guys on Vacation."

Y. Kaneko, Japan, for "A Fishing Village."

F. C. Ells, Yokohama, Japan, for "Tambo."

Vincente Mills, Monilo, P.I., for "Flagellation in the Philippines."

Nemo, London, England, for "A Doy Excursion."

J. B. S. Thubron, Fleet, Hants, England, for "Her Second Birthday."

LET'S TALK ABOUT LENSES

Continued from Page 27

And now for a word on suggesting the right focal length telephotos for your jobs. Many cinemographers find the 2" telephoto (sometimes also called a "long focus" lens) very well suited to such things as street scenes. Its included field is just half as high and half as wide as that of the 1" lens, and is regarded as a connecting link between the normal 1" and the telephoto series. Perhaps the most popular telephoto lens is the 3", because its field is such as to appreciably magnify distant objects, such as the players of a football team, and because of its relative cheapness compared to still longer telephotos. Also, it is possible to obtain a fair picture with the 3" telephoto even tho the camera is hand-held.

Beyond the 3" are the 3½", the 4", the 6", and now comes the latest thing in telephotos—the 10", 12", and 14" telephotos. Except for special work, which the average amateur may never even dream of encountering, anything over a 6" lens on a 16mm camera is to be bought with our eyes wide open to the extremely ominous possibilities of blur thru wobble of the camera, even tho it be used on a tripod. Even the most rigid of tripods will transmit vibrations too slight for us to notice to a camera, and the longer the focal length, the more trouble we're likely to get into from jumpy pictures.

Perhaps you've noticed that there seems to be a form of "distortion" in your films made with any lens other than the normal 1" 16mm lens or the ½" 8mm lens. A shot made with the wide-angle lens has the peculiar flat appearance of a Brownie camera picture, and shots made with telephotos don't seem to have the proper "per-

spective." You've no doubt noticed, even on the professional screen, that a telephoto shot of, say, a landing airplane shows the plane practically the same size several hundred feet away from the camera as it does fifty feet away.

I thought we'd get around to discussing this "distortion" this month, but inasmuch as the effect in cinemography is really tied up with projection, suppose we defer the matter until next month's concluding article of the lens series. If you've been reading articles on lenses lately and have been led to believe that there is no such thing as distortion in viewing, please draw up a choir at next month's session and prepare to watch the fireworks. See you then.

Formula for Reversing Film

Continued from Page 28

Immerse the film in this until the parts formerly densest become quite transparent. If there are found to be dark spots on the film, reversion is not complete; rinse the film thoroughly and return it to the reversion bath. Then wash, and bleach again.

The final step is darkening; this is done in a solution prepared by adding 150 grains of Sodium Hydrasulphite (NOT hyposulphite) to the bleaching bath. The film is placed in this, and the image steadily darkens until a good, brownish-black positive is produced. It is important that the Sodium Hydrasulphite be perfectly fresh; otherwise the image may not darken sufficiently, or may turn an unsatisfactory sepia tone.

After darkening, the film should be

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thoroughly washed in running water—at least 15 minutes—and then dried. Each of these solutions is sufficient for about 30 feet of sub-standard film, although the developer will last for about 90 feet. The quantities given here are those intended for use in the tanks made by the Pathex people in Europe, which hold 26 feet of film (one full Pathex charger). They are not as yet available in America, but may be had either from MM. Pathe-Enseignement, 20 BIS rue La Fayette, Paris, 9e, France, or from Pathescop, Ltd., 5 Lisle Street, London, W.C.2., England. The solutions recommended can, of course, be made up in any larger quantity for use in larger tanks. Incidentally, the chemical type of reversion does not require a solid drum developing system.

With regard to the processing of reversal film by individual amateurs, most of the manufacturers state that while methods outlined above will work with their products, they do not recommend individual processing, as an individual is rarely equipped to exercise the same exact control of all operations that the regular processing stations do. If an individual feels it is necessary to process his own film, the manufacturers point out that far more satisfactory results can be obtained by developing the film (reversal or otherwise) as a **NEGATIVE** and subsequently making prints from it.

Wheels of Industry

Continued from Page 30

16mm Recording Unit

● The Hollywood Motion Picture Equipment Co. announces a very small recording unit for 16mm cameras that consists of a glow tube about as big around as a pencil and one inch long, an amplifying set made up of one tube using a 2-volt battery. These items, together with the B battery and microphone, make up the entire Recording Unit.

Present plans are to sell the unit to the individuals and they to have local machinists fit them to their existing cameras.

16mm News Reel

● Peerless Cine News, America's only 16mm newsreel, will release its first issue early in January. Among the outstanding news events, unusual and novelty subjects featured in this first release are:

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shaped fungus; national championship auto races and other interesting short subjects.

Peerless Cine News will be released once each month in both silent and 16-mm sound-on-film and will contain news events of national and international importance, historical events, odd and interesting people and places, human interest stories and educational subjects.

PHOTOGRAPHIC ANNUAL

The 1935 Annual has been issued by the American Photographic Publishing Company.

This year's edition contains much for the miniature camera user. One article that will undoubtedly interest is by John

LIKE NEW, Mitchell Camera, silenced Academy aperture, Pan Tachar lenses, free head tripod, 1000-ft. magazines, complete—\$2000. Hollywood Camera Exchange, 1600 N. Cahuenga Blvd., Hollywood, Calif.

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Laetot on "The Control of Graininess." The artistic side is recognized by such articles as "Line and Tone as Expressive Factors in Composition" by William S. Davis. "Home Portraiture with the Miniature Camera" is the subject handled by E. T. Howell.

Focus in Cine Work and Cinema Evidence in Courts will undoubtedly interest those in amateur movie activity.

Other interesting articles are "A Universal Focal Slide Rule," "Filters in Press Work," "Notes on Infra-Red Photography," "Possibilities with Photoflash Lamps," "Standard Darkroom Procedure," "Home Portraiture with Miniature Camera," "Pictorial Possibilities in the Portrait Studio," "Night Photography in Natural Colors," "Aerial Photography," and other pertinent subjects.

TRICKS

GADGETS

Another Contest

Here's how it works. Send us in tricks you have done in filming with your 8mm, 9½mm or 16mm camera. Explain them to us so that we can explain them to others in the pages of *American Cinematographer*.

For every one we publish you will be entitled to your choice of one of the prizes listed below.

By Gadgets we mean little pieces of equipment you have built, designed or devised. Equipment that works. Little gadgets you have added to your camera, projector or otherwise. For instance, we heard of one fellow who built a splicer out of a mouse-trap . . . that's a gadget.

What kind of gadgets have you made . . . what sort of tricks do you do with your camera or equipment? If necessary send us a rough sketch or a snap shot of your equipment if it will help describe it better and quicker.

Here's Your Chance to Win Equipment or Film

Frequently we have published what might be termed tricks. Such as making distorted effects by pouring sweet-oil over a glass in front of the film. Others have been published from time to time.

In the way of gadgets we have reported many things from the building of a complete 16mm camera by amateurs down to making their own reels.

What Have You Done?

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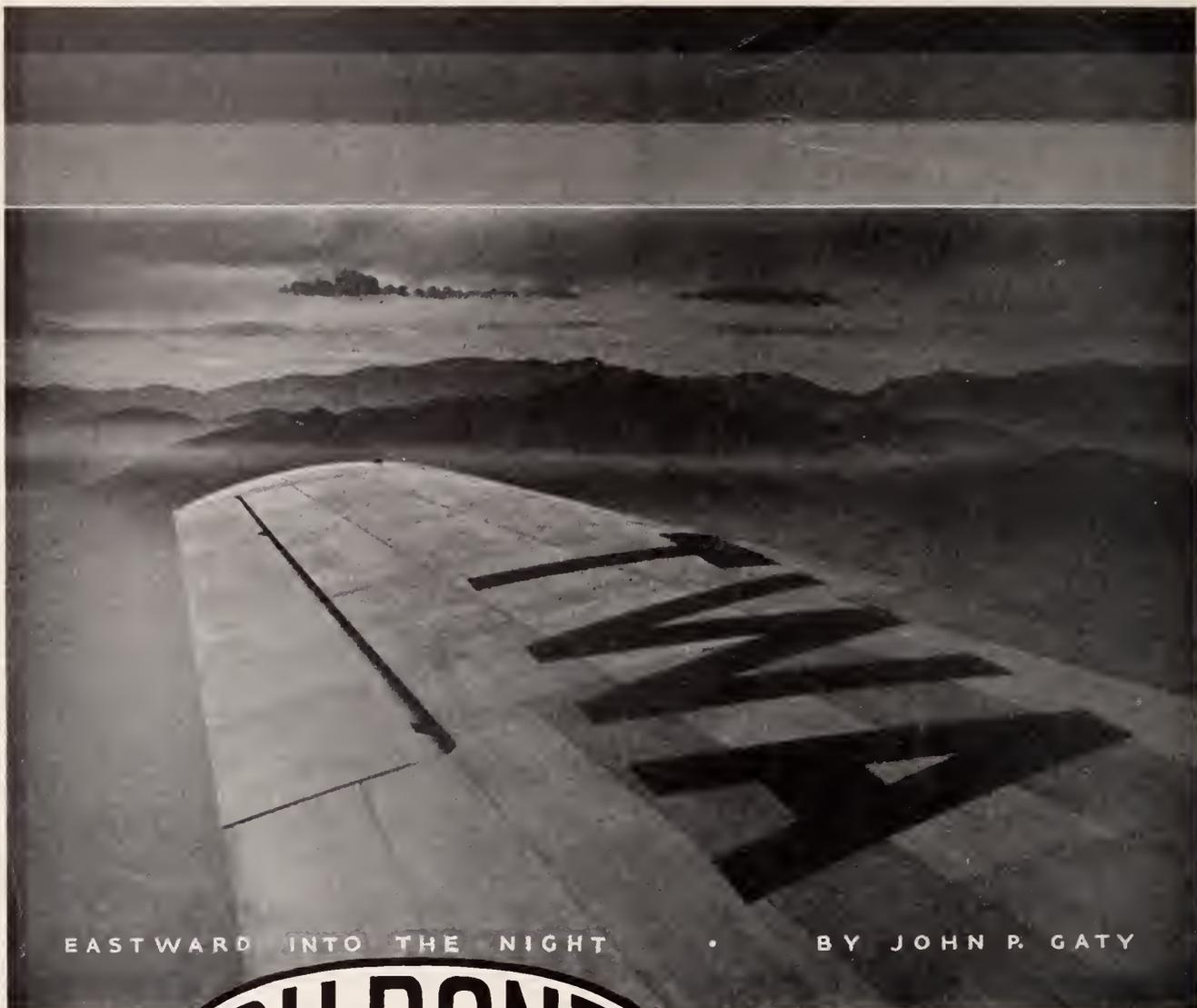
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Next Month

- Lindsley Lane will give us another comprehensive article on the relation of the cameraman to production.
- James L. Fritz, the noted dramatic editor, will give us an interview with several leading cameramen. He will analyze their photography from the newspaper man's standpoint.
- Other members of the American Society of Cinematographers will express their views on cinematography and its creative phases.

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THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science. Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship. To this end its membership is composed of the outstanding cinematographers of the world with Associate and Honorary memberships bestowed upon those who, though not active cinematographers, are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science. To further these lofty aims and to fittingly chronicle the progress of cinematography, the Society's publication, The American Cinematographer, is dedicated.

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Above is a picture of a crane ready to go into action; to follow the girl as she walks up the stairs.

THE OTHER day as I was discussing photography with one of the stars of my forthcoming picture, the actress said to me, "Mr. Milner, the man who photographed my last picture certainly had an awful problem on his hands. The director insisted on keeping the camera moving in almost every shot; even I could see that this gave the cameraman an almost impossible task. Time after time this director would dolly from an extreme long-shot to a big-head close-up of me. It didn't help the story any—and I'll never understand how the Cinematographer managed to photograph me as well as he did; surely, he got no help from the director! Why in the world do so many directors overdo this moving-camera business so badly?"

I couldn't answer that question immediately. It has been my good fortune to work with several directors who understand the use of the moving camera, and employ it wisely—even brilliantly. It has also been my bad luck to work with other directors whose use of travelling shots can only be described as stupid, or worse. Certainly, no trick of film-craftsmanship can be more effective when correctly used: but for the past few years we have endured a veritable orgy of indiscriminate dollying. Many times a Cinematographer will begin a picture by putting his camera on a dolly—and never remove it (or stop moving) until the picture is finished. There is far too much truth in the joke that Cinematographers, instead of asking "How many scenes did you shoot today?" now ask "How many miles did you dolly today?"

In my own experience, two directors stand out for their intelligent use of the moving camera: Ernst Lubitsch, and Cecil B. de Mille. Both of them use camera-movement only to emphasize a definite climax in dialogue or pantomime. Lubitsch, for example, regards camera movement as something to be used as precisely as punctuation. When he moves the camera, he invariably does it at a time when it is necessary to bring the audience closer to some impor-

Let's Stop

tant bit of business—some word, act or expression which high-lights a whole scene or sequence. And he makes sure that the technique of the shot is so flawless that the movement is virtually imperceptible to the audience—natural, inevitable, and wholly subservient to the story-action.

De Mille's use of the technique is best illustrated by two shots in "Cleopatra." The first is in the atrium of Caesar's palace in Rome, where the camera moves through the crowd, picking up a word from this group, a sentence from that, showing that every tongue is wagging with gossip about Caesar, and finally coming to rest upon the climax of the scene—Brutus and the three conspirators plotting Caesar's assassination. The second was more or less the reverse of this, for it began with a close shot of Antony making love to Cleopatra on the barge: then the curtains were dropped around them, and the camera receded to reveal the immensity and splendor of the setting, thus pointing the intimacy they achieved in spite of such regal and public surroundings.

On the other hand, I have worked with other directors who insisted on dollying frequently—seldom for any positive cinematic or dramatic reason—and with at least one whose only thought of sets was that there be sufficient room to dolly continuously!

I decided to see if other outstanding Cinematographers did not agree with me that the moving camera is being gravely abused by a great many directors, to the detriment of their productions. Charles G. Clarke, A.S.C., says, "The average moving-shot is simply a sign of directorial weakness. Of course, a moving-camera shot—in its right place—can be very effective; but to me the majority of such shots are simply indications that the director is not sure of his craftsmanship. All too often, they are dragged into a sequence without rhyme or reason—many times when more sure direction would make normal shots and cuts tell the story far more effectively. In such cases I believe that the director is simply fooling himself in one of two ways. It may be that he is unable to give the scene its proper tempo—to keep it moving fast enough—so he introduces the false movement of a dolly or crane shot in order to make himself (and his superiors) believe that the scene is moving properly.

"In other instances, the misuse of such shots is an even more pitiable admission: that the director feels his methods growing 'old-fashioned.' In such a case, he resorts to the moving-camera technique as a visible means of showing that he, too, can be 'modern.'"

James Wong Howe, A.S.C., said, "The average moving-shot results simply in injecting a sort of false movement into a scene or sequence. It interrupts the progress of the story, and wastes valuable film-footage. For example, suppose we have a long-shot of a man, and want to bring the audience closer to him for some reason. If we move the camera toward him, and truck to a close-up, we

Abusing Camera Movement

by
Victor Milner, A.S.C.

delay the dramatic action, and waste much valuable screen-time. Moreover, the camera should always be regarded as representing either the eye of the audience or, in rare instances, the eye of another player. Now the audience cannot move closer to the player in the theatre, and our scene has not showed any other player approaching him. Therefore if we must bring the audience's attention to the player's face, the natural thing to do is to progress by direct cuts from the long-shot to the closer one. Yet if the situation emphatically calls for the moving camera, the way to make the trick appear natural—and hence undisturbing to the audience—is to have the actor start toward the camera and then—and only then—allow the camera to move forward. If the camera in its motion is to represent the eye of another player, the logical treatment would be a shot of the second player starting to move forward, followed by the trucking shot. In either instance, the movement is coordinated with something which makes the changing viewpoint believable.

"It is always a breach of cinematic good taste to dolly around a player. Such treatment is largely used in instances where surprise is dramatically vital—but it gives the audience very clumsy warning that something is to be seen 'just around the corner.'

"Scenes in which the camera follows players walking through a set are illogical and distracting—once more a case of false motion. It is far better to use an ordinary shot through which the player walks, for this gives a more definite impression of movement.

"From the purely photographic viewpoint, most moving-shots take us right back to the deplorable 'early talkie' conditions. Even though the scene may be a close angle, it must, due to the physical requirements of the camera movement, be lit as a long-shot. This of course precludes the refined lighting of a true close-up, and makes it virtually impossible to maintain a uniform quality throughout the picture. Where stars who require a definite type of lighting are concerned, this is most unfair to both star and Cinematographer, and wastes time, effort and money without an adequate dramatic return."

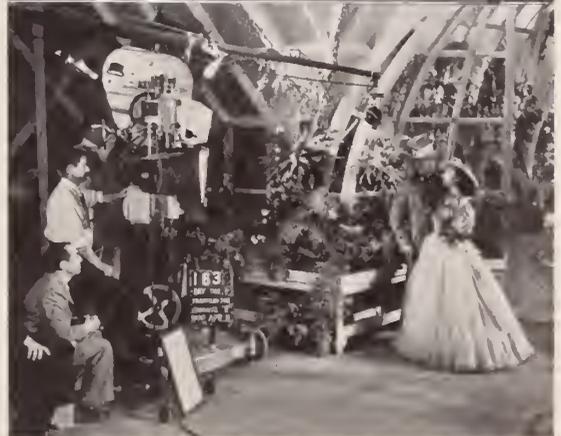
Gaetano Gaudio, A.S.C., remarked, "A crane or dolly

shot is just like any other photographic trick—diffusion, character lighting, flat lighting, etc.—good only when used in its proper place, and bad when used at any other time, or in any other way.

"I think that there are three points that should be considered. First of all, the physical equipment we have for making moving-camera shots is as yet far from perfect. Aside from ordinary panning shots, where the camera is actually motionless, and the movement is produced by a skilled operative, we have to make our dolly and crane shots with equipment that is in some degree a makeshift. To be technically perfect, a moving-camera shot should be as smooth as is our own vision when we turn our head slowly. I don't think anyone has ever made a travelling-shot that smooth! Consider the problem: on a floor-area only a few feet square, we are combining the weights of the Cinematographer, the Director, the operative camera-crew, the microphone-man, a microphone-boom, lights, a heavy blimped camera, and the weight of the perambulator itself (which may be several tons alone). This will inevitably show up any weakness or irregularity in the stage floor: and when we do put down some sort of a track, it is usually flimsy, and often a makeshift affair thrown together out of rough planks. How can such a shot be smooth?

"Secondly, moving-shots interfere with good composition. You may be able to begin with a good composition, or to end with one. Sometimes you may even manage to begin and end with good compositions—but you can't for the life of you make every last frame of a dolly-shot where the camera trucks forty or fifty feet through a set a satisfactory composition! And in motion pictures, composition isn't just an artistic talking-point—it's good business, for it focuses the audience's attention where you want it, and

(Continued on Page 58)



Above, view of a crane set to pick up the characters on the staircase and to follow them. Below, a perambulator in what would look like a tight spot for follow up work.

THROUGHOUT time in life there is change—inevitable flux and cumulation. Man gives various interpretations to this change, sometimes calling it Progress. Possibly there is no more interesting and perfect example of progressive development than the motion picture, because of its spectacular and rapid growth, its importance as a phase of modern times, and the fact that the screen is a broad reflector and interpreter of life, depicting past and present manifestations of that continuous changing.

The motion picture is indigenous with modern times, it could have no being until the present economic, scientific and cultural conditions prevailed; and because it is so significantly integrated with the life of today and is the most human aesthetic medium, it is potentially the greatest living art, with fascinating possibilities of becoming the most powerful civilizing and aesthetic influence in the future.

The entire process of motion picture creating is one of selection, synthesis and emphasis, the purpose of which is to stimulate the picture-goer's imagination. During the showing of a picture the percipient's imagination is directed and controlled, so that there is indicated a fuller significance in the picture's philosophy than is specifically delineated. Also there is a far broader range of visual and aural images conjured before the mind's eye and ear than is actually shown on the screen. Furthermore, the various story characters gain many solidifying attributes, becoming more real and human than the limited number of times, places and situations that they appear in a picture would alone make the observer believe them to be. In other words, it is as though the picture were a leading melody; and the supplementary imaginings stimulated by the picture in the percipient's mind, a counter-melody; this counter-melody forming with the picture a whole experience of great satisfying completeness.

The relative presence or lack of this complete experience of imagination stimulated in the percipient exerts decidedly more influence upon the success or failure of a picture than is generally appreciated. Frank Capra is today the most consistent exponent of full composite melody through picture stimulating counter-imagination; and as a consequence his pictures are referred to as being "alive." Such "aliveness" is exemplified in the phenomenally successful "It Happened One Night" and "Broadway Bill."

Counter-melody, as thought of here, is composed of two general factors: (1) the sum of the percipient's own personality (past experiences) projected into thoughts, characters, things and situations portrayed on the screen; plus (2) his specifically conditioned responses to certain technique, symbols and implications (matter and form), conventionalized through repeated employment in extending the scope of the temporally and spatially limited cinematic medium.

Time goes on and motion pictures improve. There is, first, the cumulation of experience within the community obtained through contact with life; and, secondly, the accustoming of motion picture audiences to a language that becomes more diverse as they learn its idiom. Each of these two factors inter-acting with and influencing the other, and in turn being stimulated by and stimulating the other to further growth.

So it is that the motion picture in its continuing progress of refinement and range of expressiveness is becoming less and less a simple universal tongue and ever more a language to be understood only by the cultivated initiate. And it is this fact, fundamentally, which commands each of the medium's creative contributors to a common high



Sound hampered photography; made it static as speech was considered of paramount importance, but photography is again coming into its rightful important place.

Cinematographer Plays

place culturally and aesthetically. The philosophical concepts bearing upon the picture's construction and story, possessed by the director and author must likewise be the property and working basis of the cinematographer, otherwise no consistently mature dramatic-pictorial result is possible.

As the Director of Photography approaches the ideal of his function, his work will become increasingly intellectual. This is not to say that his control over lights and camera will be lessened; on the contrary, it will be amplified. Released from the confining operations of mechanical routines, he may more ably watch over the broader aspects of synchronizing his instruments to the fullest cinematographic unification of the photoplay material and form with its subject matter.

And, for the same reasons that the director of photography is compelled to take on larger responsibilities, and to detail certain duties and trusts to his operative cameraman and assistant that he formerly exercised himself, so must the operative and assistant realize and assume their new responsibilities. The operative will know the story; will anticipate more closely new set-ups and changes that occur during shooting; must know his chief and his methods better, so that he can work with the cinematographer more perfectly; and of most importance, the director and cinematographer must be able to rely implicitly on the operative's judgment as to the correctness and effectiveness of the camera and its movement in recording the scene. That means the competent operative will be a thorough student of his work as it applies through the psychology of fluxing composition to the dramatic content of the story. As an ambitious cameraman, he will constantly train himself in the basic concepts essential to eventual directorship of photography.



A.
Lindsley
Lane, A.S.C.

Leading Part in Group of Creative Minds

By
A. Lindsley Lane, A.S.C.

It is now generally acknowledged that four main elements constitute the substance of motion picture creating: Author, Director, Cinematographer and Actor—all bound together by a common purpose under the supervision of the producer. As the screen has progressed, each of these co-workers, starting from lowly beginnings, has advanced his technique and improved the quality of his individual contribution to the finished photoplay. Of these four the Cinematographer has realized least recognition; for the scientific development of his tools and the tremendous impetus given his work by the introduction of ever more sensitive film have, to a large extent, confused the issue and overshadowed his own achievements as a creative artist. However, because of the motion picture medium proving itself through time to be exactly what it is—the means of telling a story primarily through the motion picture camera—the Cinematographer must eventually arrive at his logical place in the group of creative motion picture co-workers.

The Cinematographer made steady artistic progress from the inception of the first features until the advent of the "talkie," at which time he suffered a severe set-back.

Major technical changes affected him adversely, and temporarily pushed him aside floundering in a slough of uncertainty and stilted cinematography.

Gradually, as the novelty of sound wore away, and the newly begotten problems of audible screen characters were partially solved, some of the pictorial restrictions were loosened, largely through the insistent efforts of the Cinematographer; and in time not only was the "silent photoplay cinematography" of mobility and expressiveness regained, but also (and partly because of the new conditions imposed on cinematography by sound) a higher degree of artistry was obtained than theretofore. For example, it was now possible to mix hard and soft light, with the attendant extended range of monochrome vitality and delicacy in dramatic contrast giving a finer illusion of naturalness and reality.

Then too, the formal separation of camera operation from general photographic supervision and lighting was forced upon the industry at this juncture because of multiple-camera shots and the much added bulk of sound cameras over the compact and more easily manipulated silent cameras. Also the nascent sound-picture tempo made necessary a greater mobility of camera, which, with the camera equipment's increased inertia, made inevitable on advancement of the second cameraman to operative cameraman, he assuming responsibility for all physical operation of the camera; the director of photography and the operative now working together as a unit of augmented effectiveness. The beneficial results of this apportionment of endeavor failed to show at first, but later when everyone concerned with the making of talking pictures knew better what they were doing, and the multiple-camera shots were fast losing favor, there came a marked improvement in cinematographic-dramatic interpretation.

Going back again to early sound-cinematography troubles, there was the uncinematic bias of dialogue itself. Much of the static quality of the first talkies was due to over-long dialogue scenes, resembling the manner of the legitimate theatre. These extended moods were difficult of capturing and sustaining, so directors often demanded that entire sequences be photographed in a continuous multiple-camera shot; thus devitalizing the fluency of the camera eye.

So the tendency of the talkie was to remove cinematography further away from its inevitable function—that of more than a mere vehicle for dramatic photoplays—that of a part of the dramatic expression and intent itself. The talkies stigmatized cinematography as a necessary evil to be tolerated.

As the ruinous results of this short-sighted attitude became evident, producers and directors re-awakened to the essential need for cinematography as an integral part of the emotional flow of a photoplay if the success of talking films was to become permanent. And the tortuous way back to the old silent days' technique of many angles and rapid cuts, plus sound-camera equipment, was begun.

But it was discovered that simply to go back brought no basic solution; aesthetic obstacles intervened which were impossible of attack with the old methods. An almost entirely new medium had arrived with the audible character. For one thing, adjusting and balancing the components of the silent picture to and with the audible screen presented a fine problem of tempo. It became apparent that a strange paradox existed in the tempo of the talkies, as compared with the simpler construction of temporal progression in the silent picture.

(Continued on Page 58)

Variety Names Ten Best Cinematographers

"Variety" Issue of January 1, 1935

Editor's Note: This year "Variety," one of the Show World's leading trade papers, names the Ten Best Cameramen and comments upon these selections and the camera crew in general. We hand you herewith Variety's article in full.

STARS will tolerate supervisors, producers or directors. They will argue over stories or scripts, battle over clothes and give in most of the time. But when it comes to a cameraman—that's where the star will stand like Gibraltar. The favorite cranker must be or the picture doesn't start.

Several of the femme stars demand their own particular cameraman, even have it specified in studio contracts that certain cinematographers be assigned to their pictures. Others hold verbal agreement with the contracting studio that they have the right to select the man who is to photograph them.

Top stars seem to figure that the cameraman holds the key to the problem of keeping on top of the heap. And make no mistake, a regular cinematographer who intently studies setups for both close and long shots, to protect the player against either poor lighting or composition that plays down the star, is worth fighting for.

Many times top ranking players, and in some instances directors, have refused to start pictures until the cameramen desired are available. The situation leaves nothing for a studio to do but pull the demanded photographer off another production or stall the picture until he is available.

Doniels and Garbo

For instance, William Daniels has photographed Greta Garbo since her first picture at Metro nearly 10 years ago, and the Swedish girl will not go to work until Daniels is behind the lens. He has also photographed Norma Shearer for the past several years. Should both Garbo and Shearer happen to be in production at the same time, or their pictures overlap, Daniels goes with Garbo.

George Folsley got a break to handle a Marion Davies feature more than a year ago. Now she won't have another cameraman on her pictures. With the star moving over from M-G to Warners it is likely that a loan-out deal for Folsley will be arranged. Up to the coming of sound, John Arnold handled the Davies productions and was always held by Metro for her.

Rollie Totheroh has been chief of the camera staff for Charles Chaplin since 1917 and was carried between pic-

10 BEST CAMERAMEN

William Doniels—Metro
George Folsley—Metro
Roy June—Goldwyn
Charles Long—Paramount
Victor Milner—Paramount
Karl Struss—Paramount
James Wong Howe—Metro
Charles Rosher—20th Century
George Bornes—Warners
Arthur Miller—Fox

•

SECOND TEN

Tony Gaudio—Warners
Bert Glennon—Fox
Oliver Morsh—Metro
John Seitz—Fox
James Von Trees—Warners
Leo Tover—Paramount
Peverell Morley—20th Century
George Schneiderman—Fox
Joe Walker—Columbia
Sol Palito—Warners

•

TOP SPECIALISTS

Exteriors—Clyde DeVinno, Joe Valentine, M-G.
Airplane photography—Elmer Dyer, WB.
Process and trick work—Fred Jockman, WB; Forciot Edouart, Por; Vern Wolker, Rodio.

tures by the comedian up to about five years ago. Walter Lunden has been with Harold Lloyd since the comedian started his own production unit some 10 years ago.

Victor Milner, perhaps the dean of cinematographers in point of service now consistently working, has the inside track as head cameraman on any picture Ernst Lubitsch directs. Pair split when the director went to Metro to make "Merry Widow," as Milner was tied up with DeMille on "Cleopatra" at Paramount, where he is under contract. Milner goes on the next DeMille picture and no one knows what will develop if Lubitsch is ready to start his next Paramount around the same time.

Until his sudden death some weeks ago, Henry Gerrard had first call on any and all pictures Katharine Hepburn made at Radio. Joe Walker must be behind the camera when Frank Capra rolls up his sleeves at Columbia. Walker made a trip back to London, where he was offered several pictures in a row, to camera for Capra on "It Happened One Night."

Clark's 87 for Mix

Of the old-time star-cameraman teams Dan Clark probably holds a record in photographing 87 straight Tom Mix westerns between Fox and Universal. Charles Rosher was exclusive cameraman for Mary Pickford for a long time and Tony Gaudio was the first pick when Norma Talmadge was starring for Joe Schenck. The late Billy Bitzer was with D. W. Griffith for years and Pev Marley seemed to be the camera shadow for Cecil DeMille over a

(Continued on Page 56)



At the camera is Charles Lang, A.S.C. Cinematographer Lang was last year awarded the trophy for Photography by the Academy of Motion Picture Arts and Sciences.

Lang's Photography Has Vitality Says Critic

by

James L. Fritz

Formerly Dramatic Editor of St. Louis
Past Dispatch and N. Y. Daily Mirror.

AFTER talking to this quiet and unassuming young man who rose from the lowly rank of an assistant in the laboratory, to become the winner of the 1934 Academy Award, you can readily see why his pictures possess the dynamic vitality that almost makes them live and breathe, instead of remaining an inanimate piece of celluloid.

Charles Long, who studied to become an attorney and then changed his entire life, so that he would be able to follow the one thing that meant most to him, cinematography, has, beneath his calm exterior, this same gripping vitality and dynamic energy that you feel in his art.

In his latest picture, "Lives of a Bengal Lancer," this something that has made him one of Hollywood's best

cinematographers, is undeniably present. True, in this production, Lang had a great deal to work upon, but on the other hand, the picturesque beauty of the native costumes, as it is captured by his lens, makes the production seem almost real. Again, in the last scene of the picture, this vital something makes itself strangely felt by bringing out the dramatic pathos and stirring action, which, in Lang's work is always so remarkably apparent.

Lang never allows his subject to become drab and colorless. He endeavors, at all times, to place himself in the frame of mind of the audience, so that his camera, instead of remaining the cold mechanical eye that it is, becomes the eye of an artist. An artist who is able to see more than what appears on the surface, but is gifted with an ability to capture and hold the throbbing undercurrent of life itself. His dealing thus with a subject, also brings out the true underlying qualities of the subject, therefore making what we see, more than merely a reproduction of the subject, but allows us to absorb with our eyes, the personality and emotion embodied in the subject.

Lang admits that he does not know how he manages to inject this gripping vitality into his pictures. He also admits that there is no set rule or formula to follow, to obtain this effect. Yet he tells us that it is not a special gift of talent, but that any cinematographer may create the same illusions, by delving into extensive research in the art of cinematography. When working on a picture, Lang is not merely the man behind the camera. He becomes a combination of a sculptor and painter. His lens is the chisel with which he molds his subject into a thing of life and beauty, and his lights are the brush with which he endows it with vitality and color.

Any cinematographer knows that there is no definite course to follow to obtain these effects. He, like a painter, merely learns through his past mistakes, which are oftentimes many, and the old recognized school of long experience. We compare a cinematographer to a painter, because he too, is an artist. Where the painter works with oils, the cinematographer brings out his picture with lights and shadows. To illustrate this, we will go far back into history.

The first photographers endeavored to bring out their subjects in a hard, cold print. The result of this was often brutal. The following generation of photographers went to the other extreme and began shading and softening their subject, until the result was even worse. The lines became blurred and fuzzy, and the subject, instead of taking on the appearance of a painted portrait, the effect they were trying to capture, became an unintelligible mass of shades, with no definite outline.

Where those pioneers of the lens made their mistake, was in trying to copy. A copy is wrong—to create is the ambition of every true artist, and the cinematographer has proven himself to be a true artist. The first pictures were made on the old principle of the hard, cold print, and from there, the cinematographer progressed, until today, he has arrived at a product which, in many cases, equals the beauty captured by the old masters.

In all of his pictures, Lang uses a black and white color treatment. By color treatment, we mean the ability of the artist to give the illusion of many and varying colors when using but black and white. This is done, Lang tells us, by creating an illusion with light. For instance, on a clear day, the sky, to the naked eye, has an unfathomable appearance. It is this appearance, by the use of filters, that Lang endeavors to capture, when photographing cloud formations. At night, the aspect changes from unfathomable

(Continued on Page 56)

Struss

Photography

"Luxurious"

Says

James L. Fritz

Formerly Dramatic Editor, St. Louis Post Dispatch and New York Daily News.



**Karl
Struss,
A.S.C.**

A RECENT review of "Belle of the Nineties" contained the words, "Karl Struss is able to make black and white look more like color than any cameraman now in Hollywood." Struss has his own ideas about color photography and the treatment of color when using black and white. He was one of the pioneers in color experiment, having used it in "Ben Hur," many years ago.

Struss, at present, is one of the "most-in-demand" cinematographers in Hollywood. The reason for this demand for Karl Struss is because of his ability to make a glowing epistle of life and beauty of all the pictures he is called to work on. Struss is undoubtedly a cinematographer who admits no limitations with the camera. He realizes that both the special feats of the machine and its possible perversions are equally manifest. The injection of a glowing quality and the effect of luxuriousness which makes Struss' pictures more than merely a replica of what is transmitted through the lens, illustrates the typical development of the art of cinematography and its students.

Struss attempts to penetrate and capture the unique esthetic moment that singles itself out of the thousands of uncrystallized and insignificant gestures that occur in the course of a day. It is his constant striving toward this impressionism that brings out the characterization of his subjects. Not only do the living subjects benefit by this imaginativeness on the part of the cinematographer, but the settings and backgrounds also take on a richer and more voluptuous aspect. This quality of imaginativeness in Karl Struss is the one underlying quality that has brought him to the fore. His objectification and understanding of the subject he is photographing, are important developments in the progress of a cinematographer.

Struss recognizes, in his camera, an instrument with manifold and conflicting possibilities. It may be used as a passive substitute for experience, or it may be used to concentrate and intensify and express new forms of experience, but it cannot be used as a short cut to escape the necessity of organic experience. Struss points out that just as the microscope is useless unless the eye of the user is trained to its possibilities, so also, does the camera depend for its success upon the cultivation of the organic, physiological and spiritual aptitude of the man that stands behind it.

Struss has several important cinematographic discoveries to his credit, including the generally used Struss lens,

and the "lupe" light. He won the photographic award of the Academy of Motion Picture Arts and Science, with "Sunrise" in 1926. It has been through the untiring efforts and diligent research into the arts of cinematography of men like Karl Struss, that the motion picture became a glowing and beautiful interpretation of the inner realms of fantasy, instead of remaining an indifferent reproductive device, less satisfactory in most cases, than the poorest melodramatic legitimate stage production.

The cinematographic success of Struss cannot be laid wholly to his understanding of the machine with which he is working, alone. His imagination must be called upon to clothe his subject in an atmosphere coinciding with its intended characterization. To obtain these effects, camera angles that might appear freakish or affected, are sometimes necessary. Not only must the background be subordinated to the subject, but its relationship to the subject must be made clear and justifiable.

Struss is one of the few cinematographers who have weathered the radical changes and revolutionary introductions of new technicalities into the art of cinematography. He has advanced and kept pace with these introductions since the beginning of motion pictures, until today finds him, in some phases, even advanced in the field of cinematographic research and discovery. It is his theories on the treatment of color to which this reference is made. Struss maintains that the best color photographic effects can be obtained through the use of pastel shades. Art directors and costume designers have been involving for some time the already complicated problems of the cinematographer. It is here, Struss points out, that the basic fault with present method of color treatment can be found. The ideal photographic results can be obtained in monotonous, ranging from black to white. These are the only colors that reproduce on the screen. "So why not?" he asks, "begin with the basic tones?" He admits that it is true colors photograph to a certain extent, according to their brilliance. That is, a touch of gold or silver will lend flash to a scene, but throwing together of greens, blues and purples, plainly distinguishable to the eye, results in a single color effect on film. This is not only a problematic issue to the cinematographer, but in some cases becomes detrimental to the subject.

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Charles
Christie

American Cinematographers Influence World

by

Charles Christie

Vice-President, Mitchell Camera Corp.

Editor's Note: Charles Christie, vice-president in charge of sales for Mitchell Camera Corporation recently returned from a trip around the world. He visited studios in both Europe and the Orient. We are pleased to publish his opinion and findings.

RECENTLY the American Cameraman not only invaded but practically overran British studios. Great Britain is looking toward world markets.

Central Europe, however, is opposite in its view of the American technician and cameraman. They want nothing of him. Not that they feel they have superior talent, but they want those jobs for their own people.

The Orient would welcome American cameramen with open arms. They would import every one they could induce to come to their country if they could afford to pay the salaries, not only demanded, but the salaries these men are worth to their industry.

Unfortunately, however, I do not believe we will see the day in our time when these oriental studios will be able to put into production, and cinematographic broins, the money that will always be available here and in the Central European countries. I say this because the market for the

productions turned out by Japan, India, and other oriental countries is confined to their own borders.

This means small budgets, but not pictures in the sense of our quickies, because India usually takes about 60 days for one feature. When so much time is consumed in the making of a production it is natural that salaries and other overhead expense must be kept down.

It is not unusual for a feature production in both Japan and India to run fourteen reels in length. Often the attending of a picture show is an event that requires a whole day; people take their lunches on many occasions so as to take in the entire program.

The technique of the Orient is especially backward. They do not have the many technical facilities originated here in Hollywood. I did not notice one case of background projection. Any special effects the cinematographer wishes to procure he must do with his camera. They do not have optical printers.

It isn't that they do not have the desire for these things or the need of them, the earning power of their productions will not permit them to invest in luxuries of this nature. It doesn't take much analysis to know that the Japanese pictures will be shown in Japan only, that the pictures in India do not have a great market even in their own country because of the many languages spoken within their own borders. In both countries also theatres are limited.

In the early days of this industry the cinematographic capitals were in Italy, France and Berlin. Today their studios are working at low ebb. Especially Italy, the country that gave us "Caberia" and "Quo Vadis," the first really great pictures, is practically non-existent as a producing center.

France continues to make pictures for itself and the other countries speaking French, but Germany is rapidly declining. Before a picture can be put into work in that country the script must be read, censored and approved. This does not mean that that picture can be marketed when it is finished. After it is made it is then censored by another department and they may turn it down in spite of the fact that the script was altered to the opinion of the script censor. Money will not take these risks in Germany with the result that some of the producing companies have gone into bankruptcy.

Of course, all eyes are still toward America. The American cinematographer and the American technician, they realize, could give them the foundation necessary to look toward world markets. They know they must have the technicians even before they have the stars and directors, because they dare not present the work of those great names less artistically than they are presented here in America.

All foreign camera men study the work of the American cinematographer very closely. They conscientiously attend every showing of an American picture. They especially follow the work of some of the leading men behind the camera here in the Hollywood studios. However, it is not possible in most instances for them to even attempt to duplicate the work of these men because they do not have the lights, the facilities and accoutrements that will permit them to recreate these conditions even if they know how it is done.

The foreign stars who have come to this country to be photographed and then return again realize the great artist the American cameraman is, realize how important he is to their success. They then thoroughly understand why some of the American stars insist upon certain men photographing all of their productions.

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Expressing Tempo In Lighting



by
John F. Seitz, A.S.C.

THE relationship between tempo and lighting in Cinematography is difficult to analyze: it undoubtedly exists, yet it is not easy to express it in concrete terms. Tempo is essentially dynamic; lighting is generally static. None the less, there is a fundamental point of contact between the two in that both are means of producing, by visual means, positive psychological responses, and must, as such, be closely coordinated.

Tempo itself may be defined as indicating the degree of swiftness or slowness with which a scene or sequence moves. Further, it may be subdivided into two interdependent categories: physical tempo, and dramatic (or narrative) tempo.

The former obviously refers to the physical pace of the action filmed. Clearly, if action moves at a swift physical pace, it will consume less screen-time; accordingly, the eye of the beholder must react more swiftly, in order to see and to transmit to the brain a clear mental image of the action in the brief time allowed. If this is to be done, the Cinematographer's presentation of the action must be such as to aid this quick visual reaction. The composition should be simple, leading the eye at once to the salient portions of the field of view. The lighting should be incisive and brilliant (though not necessarily of a higher key), in order to facilitate visual perception, and mental comprehension.

In a swift-moving battle sequence, for example, the visual treatment should be such as to reveal the vital points of the action at a glance. Primarily, this would logically be achieved by maintaining the low visual key which the mood of the action demands, but increasing the brilliance: minimizing the diffusion introduced in camera and lighting, and simplifying the visual scale to an easily-read range of positive highlights and shadows, with a minimum of intermediate half-tones.

In a more slowly moving sequence, on the other hand, speed in visual perception is not so necessary. Therefore, the photographic tempo may be slower. A greater degree of visual softness is possible, and the lighting and composition may become more intricate.

Where there is a definite sense of physical movement

to be conveyed, the lighting can do a great deal to enhance this effect. For example, suppose we are to film a scene of a parade, or of an army on the march. Here is a definite instance of forward physical movement, which can be accentuated through lighting. I doubt if any cinematographer would care to light such a scene flatly. No matter whether natural or artificial illumination were used, the natural thing to do would be to strive for a cross-lighting, creating, if possible, parallel stripes of pronounced light and shade across the line of march. The movement of the actors across this light-and-shade pattern, progressing alternately from light to shadow, will heighten the sense of physical movement, and accordingly enhance the tempo.

The same principle is used in the familiar scenes showing players apparently inside a moving automobile at night. Without in any sense detracting from the importance of process backgrounds, which of course lend realism to the scene, it must be admitted that a great part of the sense of movement is imparted by the changing light and shade thrown on the players in simulation of the effects of the street lights as the car passes.

Musical films, of course, offer the greatest opportunity for lighting-tempo. In them, or, rather, in their musical and dance sequences, there is a definite, physical movement, usually strongly rhythmic. Such sequences offer tremendous opportunity for imaginative lighting, which can greatly enhance the sense of rhythmic movement, and in consequence, of tempo.

In this connection, may it not be remarked that our present approach to the problem of staging musical films appears decidedly illogical? The conventional practice is to design and build the sets first, after which the musical people fit their compositions and lyrics to the setting, while, in turn, the Cinematographer (and the Director, too) must attempt to coordinate the two in the filming. To my mind, it would appear to be more logical to have the music and lyrics completed first, after which the settings could be designed to suit the mood and tempo of the song, and the Cinematographer could have a more coherent unity with which to work. The same, in a great measure, applies to dance-scenes, as well.

The matter of dramatic tempo is rather less tangible than physical tempo. It will be recognized that a scene

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PHOTOGRAPHY

of the MONTH

"THE BAND PLAYS ON" (M-G-M)

Leonard Smith, A.S.C.: Directing Cinematographer
Daily Variety (December 17, 1934): "—and fine photography—."
Hollywood Reporter (December 17, 1934): "Leonard Smith's photography is uniformly excellent."
Film Daily (December 22, 1934): Photography "Good."

"CHARLIE CHAN IN PARIS" (Fox)

Ernest Palmer, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 22, 1934): "—and photography and mounting are first class."

"LIVES OF A BENGAL LANCER" (Paramount)

Charles Lang, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 26, 1934): "—and the most beautiful photography ever seen in such settings."
Daily Variety (December 24, 1934): "Photography by Charles Lang is a thing of magnificence, especially the scenes in the rocky terrain of the fighting and marching."
Motion Picture Daily (December 26, 1934): "The photography by Charles Lang is exceptionally fine."

"THE GILDED LILY" (Paramount)

Victor Milner, A.S.C.: Directing Cinematographer
Daily Variety (December 24, 1934): "Photography and production are both excellent."

"THE BEST MAN WINS"

John Stumar, A.S.C.: Directing Cinematographer
Daily Variety (December 27, 1934): "Best thing in the picture is the underwater photography."
Hollywood Reporter (December 27, 1934): "The diving stuff is all excellently done, both photographically and for suspense." "—and the photography, which is swell, is all to Stumar's credit."
Film Daily (January 2, 1935): "Photography Good."

"ONLY EIGHT HOURS" (M-G-M)

Lester White, A.S.C.: Directing Cinematographer
Hollywood Reporter (December 31, 1934): "The photography was exquisite—."
Motion Picture Daily (January 4, 1935): "Lester White photographed well."

"THE NIGHT IS YOUNG" (M-G-M)

James Wong Howe, A.S.C.: Directing Cinematographer
Motion Picture Daily (December 22, 1934): "James Wong Howe, one of Hollywood's ace cameramen, photographed well."

"WHITE LIES" (Columbia)

Benjamin Kline, A.S.C.: Directing Cinematographer
Motion Picture Daily (December 22, 1934): "Benjamin Kline's photography is good."
Film Daily (December 27, 1934): Photography "Good."

"DAVID COPPERFIELD" (M-G-M)

Oliver T. Marsh, A.S.C.: Directing Cinematographer
Hollywood Reporter (January 7, 1935): "Marsh's camera work was in Marsh's most brilliant manner."
Daily Variety (January 7, 1935): "Photography of Oliver T. Marsh is exceptionally fine."
Motion Picture Daily (January 6, 1935): "Good, too, is Oliver Marsh's photography."
Film Daily (January 8, 1935): Photography "A-1."

"NOTORIOUS GENTLEMAN" (Universal)

David Abel, A.S.C.: Directing Cinematographer
Daily Variety (January 9, 1935): "Some excellent photography has been turned in by David Abel, particularly the night scenes around the old Southern mansion."
Hollywood Reporter (January 9, 1935): "Photography by David Abel is above standard."

"THE WINNING TICKET" (M-G-M)

Charles Clarke, A.S.C.: Directing Cinematographer
Daily Variety (January 9, 1935): "Photography by Charles Clarke is excellent."
Hollywood Reporter (January 9, 1935): "The photography of Charles Clarke was excellent."

"WINGS IN THE DARK" (Paramount)

William C. Mellor, A.S.C.: Directing Cinematographer
Dewey Wrigley, Aerial Cinematographer
Hollywood Reporter (January 10, 1935): "—and the photography, both aerial and studio, is first rate."
Daily Variety (January, 1935): "Fulfilling the high excellence of the picture is the striking aerial photography by Dewey Wrigley and the camera work of William Mellor—."

"ROCKY MOUNTAIN MYSTERY" (Paramount)

Archie Stout, A.S.C.: Directing Cinematographer
Daily Variety (January 11, 1935): "Photography of Archie Stout, as is usual on his outdoor assignments, is excellent."

"BORDERTOWN" (Warner Bros.)

Tony Gaudio, A.S.C.: Directing Cinematographer
Daily Variety (January 14, 1935): "Photography and production are on the general high plane of the picture."
Hollywood Reporter (January 14, 1935): "—and Tony Gaudio's photography and the mounting are first rate."

"CLIVE OF INDIA" (20th Century)

Peverell Marley, A.S.C.: Directing Cinematographer
Hollywood Reporter (January 16, 1935): "Photography by Peverell Marley is beautiful."

"THE WHOLE TOWN'S TALKING" (Columbia)

Joseph August, A.S.C.: Directing Cinematographer
Hollywood Reporter (January 17, 1935): "—and the photography by Joseph August excellent, with the double exposure shots very well done."
Daily Variety (January 17, 1935): "Camera work of Joseph August deserves a palm, particularly the trick split film stuff necessary for the dual photography."

Variety Names Ten Best Cinematographers

(Continued from Page 50)

long period of time. Joe August was tabbed as chief cinematographer for Bill Hart, cranking on most of his westerns. John Seitz was attached to all of the Rex Ingram pictures for seven years and then handled the camera for Corinne Griffith, who had a clause in her contract to that effect.

John Arnold, now head of the Metro camera department, photographed all of the Viola Dana features for the old Metro company and was also in charge of the camera crew on the King Vidor productions at Metro up to the time he took charge of the department. James Brown, Jr., has been photographer on all of the Larry Darmour pictures for several years—and doubles in brass as unit production manager. Frank Good photographed all but two of the Jackie Coogan features produced by Sol Lesser and is now back with the latter as head cameraman.

Len Powers, who was with Hal Roach for around 12 years, photographed practically all of the Warren Doane shorts for Universal up to a few months ago.

Clyde DeVinna was the camera globe-trotting companion with W. S. Van Dyke when the latter made pictures for Metro in the South Seas, Africa, and the Arctic. DeVinna is a cinch to swing back with Van Dyke when, and if, the latter takes any other expeditionary jaunts.

Ray Rennahan is rated the outstanding color photographer in the business today. He has been with Technicolor for years, was an expert on the old two-color process and is now tops in shooting the new three way development.

Leon Shamroy, under personal contract to B. P. Schulberg, has been doing all of the Sylvia Sidney productions for the past two years, while John Mescall made a tie-up with James Whale, at Universal, to shoot his pictures exclusively about a year ago. George Barnes, under Warner contract, naturally draws the camera assignment on all pictures where his wife, Joan Blondell, holds a featured spot. And you can imagine if Barnes doesn't help make his bride look okay.

Salaries

There has been a general increase in salaries to first grade cameramen during the past year. Top weekly paychecks are now about \$550 to \$600, either on contract or on a free lance basis. Despite there are about 130 first cameramen listed for production on the Coast, studios occasionally find it hard to select grade A men for available jobs when a production peak exists. Undoubtedly there are a number of capable first men

who would click if given a chance on a major lot, but they are generally passed up because camera department heads, producers, directors or players refuse to take chances with them.

As a whole, the Metro and Paramount camera departments are deemed to have the best rounded out camera crews from firsts down through seconds, assistants and still men. It is worth pointing out that these are the only two studios which have experienced cameramen as heads of their respective camera departments.

John Arnold, at Metro, is a pioneer cameraman having started in the business prior to 1910. Virgil Miller, at Par, was a first man for many years and the background of practical experience is invaluable to companies when camera organizations are being maintained at top efficiency. Outstanding first men are naturally valuable on a camera department roster, but they must depend on their crews to a great extent to get the desired results.

Few From Europe

Only three European cameramen have come over here to make the grade during the past eight years—Karl Freund (now directing for Universal), Theodore Sparkuhl, and Rudy Mate. In comparison, American cinematographers have gone to Europe to become out-

standing. Glenn McWilliams is with Gaumont-British as chief cinematographer and those on the other side doing well are Charles Van Enger, Phil Tannura, Lloyd Knechtel, Osmond Borrodaile and Harry Stradling. Charles Rosher and Charles Stumar both made a number of pictures for Ufa in Germany a few years ago. When Stumar returned from abroad he stated that cameramen over there were advertised on theatre marquees above the director of a picture.

Watching Von Sternberg

The cameramen out here are keenly watching the progress of Josef von Sternberg in acting as both director and head cameraman on Marlene Dietrich's "Caprice Espagnole" at Paramount. Von Sternberg has always been noted for his lighting and camera angles, and assumed charge of the camera crew on this picture when he was unsuccessful in moving up a favorite assistant too fast. When the cameramen's organization refused to allow the man to handle a first job without more experience, the director decided to take over the responsibility. The outcome holds the cameramen in that on all previous pictures on the Paramount lot Von Sternberg has had an ace photographer assigned to work with him.

The accompanying lists of best cameramen is "Variety's" selection based on '34 performances and executive studio opinions.

Lang's Photography Has Vitality Says Critic

(Continued from Page 51)

clearness, to the dank blackness of the pit. He also tells us that he studies his subject deeply, until he obtains the feel of it. He is then able to deal with the subject, not as if he were merely taking a picture, but as if he were writing a poem with lights and shadows. He never allows anything to melt. He uses contrasts to catch the true meaning of the story.

An example of this, is, that when photographing a mystery picture, he looks to the auroral perspective. He tries to leave the background dark at all times, to create the illusion that something or someone is lurking unseen in the shadows. On the other hand, when taking action shots, for which he is best noted, he reverses the process, lighting the background brilliantly, so as to bring out the subject clear and precise. The romantic picture receives still another treatment. Here, by camera diffusion, he obtains a softness of line, but a brilliance of subject.

One could go on indefinitely discoursing on the many methods that various cinematographers use in obtaining their

best shots, and one could not give an absolute formula to follow in mastering the art of cinematography, in which everything is tangible and anything is possible.

American Cinematographers Influence World

(Continued from Page 53)

England of course is progressing rapidly in American technique and when one visits the studios over there, in practically every one of them, you will find cinematographers and technicians whom you have seen many times in the American studios.

England has taken to optical printing; it has background projection installed and introduced by American technicians. England, however realizes that one big picture does not create a world market, it now knows that all of its production must be up to the American average, so possibly we may see a greater exodus of American talent toward the British isles.

In eight of
“1934’s BEST TEN”

OF the ten pictures chosen as 1934’s best in the *Film Daily’s* nationwide poll, eight were photographed on Eastman Super-Sensitive Panchromatic Negative. Again this Eastman film has made its contribution to the artistry and entertainment value of the productions adjudged the finest of the year. Eastman Kodak Company, Rochester, N.Y. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN *Super-Sensitive*
Panchromatic Negative

Cinematographer Plays Leading Part in Group of Creative Minds

(Continued from Page 49)

The paradox was, that potentially and cinematically, the speed of the talkie far outpaced that of the silent pantomimic film; but that, within the sequence, the physical movement and actual time-elapsed speed of the talkie was slower. That is, the cinematic movement of the talkie, in the psychological sense of stimuli for mental and emotional progression within the percipient, contained intrinsically more elements of concurrent and inter-accelerating tempo than the silent picture of alternate action and title; while the silent picture employed all possible fast physical and pantomimic movement and rapid cutting to attain the utmost pace of cinematic movement in a relatively slow-tempo medium.

Consequently, in the first years of sound pictures it was well-nigh impossible to take full advantage of the talkies' potential tempo with what amounted to photographed stage plays; for, the lack of interpretive camera flow, in conjunction with a serious unbalance of dialogue (or song) over action, precluded cinematic movement from attaining a possible one hundred percent, and slowed it to an average of less than fifty. There were, of course, notable exceptions to the prevalent snail's pace of the early talkies, "Interference" being one of these.

Thus it was seen that a new manner of "pictorial-talking story" must come if the audible motion picture was to realize the power, worth and richness of its natural endowments—a happy combination of action, gesture and facial expression, interacting with word, sound or song to achieve the ultimate in dual-progression, fast-paced, fully effective cinematic movement.

This question of tempo was but one of the more important creative problems facing the producer, author, director and cinematographer in the early years of sound pictures (and which remains to this day only partially solved, as attested for example, by the improving use of montage and time-lapse sequences), whose eventual solution required the closer integration of these

key men if the screen were to progress.

And so each new problem or development as it presents itself, brings the undeniable need for a progressively closer cooperation amongst the creative minds of the motion picture. Just as sound for the last five years has caused a sure integration of literary and dramatic content through words, sound or song, with literary and dramatic content through pictures of action and things—the general use of natural color will in the future necessitate the further integration of the "outward appearance" of characters and things, with the cinematic (dramatic - psychologic) expression of these same characters and things.

The motion picture will always remain a quasi-communal expression, due to its complex aesthetic and physical nature. The tendencies, individual bias and interests, organic as they are, of its vari-

ous creative workers must be intellectually harmonized to the communal purpose; that is, there must be a fuller understanding of each other's problems, and a larger concept by the individual of the collective aims, so that the form and material of the motion picture will more completely fuse with the subject matter in reaching its zenith of expressiveness, and in becoming increasingly mature and incisively accurate in its comment on and interaction with life.

When that maturity of concept and execution comes, it will be found that all four of the chief creative elements are on an integral par, welded together by a group understanding and sympathy almost beyond today's most sanguine hopes.

Thus must the Director of Photography play a leading part in the group of key creative minds, for his contribution in the making of a motion picture is so generically of its form and matter. Whether he wishes to or not, he is slowly but certainly being compelled to assume this, his own responsibility—and opportunity.

Let's Stop Abusing Camera Movement

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makes the picture easy and pleasing to look at.

"Thirdly, there is an appalling lack of understanding on the part of most directors of what makes a really good moving-camera scene. Nine out of ten directors will shoot an involved travelling-shot—and then 'protect' themselves by re-shooting the action in individual close-ups and long-shots. Then he 'shows off' to the Front-Office in the projection-room where the dailies are run, pointing to his moving-camera technique as evidence of his ability as a director. But when the final cut of the picture is made, it is usually those conventional 'protection-shots' that are used—while the dolly-shots go into the ash-can! If studio officials would investigate this, checking these wasted, unused dolly-shots against the time, effort and money wasted in making them, there would be fewer so-called clever directors (or rather, they'd find out who were the really clever ones!) and pictures would be made better and more efficiently."

Charles Lang, A.S.C., points out that "It is necessary to consider the style of the director before saying much about any individual moving-shot. Some directors make an amazing number of difficult dolly-shots, yet they fit so perfectly with the director's style that they can hardly be condemned. Other directors use the moving camera haphazardly, either covering up with protection-shots, or forcing the use of dolly-shots in the wrong place, both of which are bad. In general, if a director's inherent style is predicated upon the use of the moving camera, and he uses it intelligently, no Cinematographer will complain: but we should all strive to educate the men who do not understand the proper use of perambulating, and show them how indiscriminate dollying wastes time, money and footage, and hurts, rather than helps, their pictures."

The opinion of George J. Folsey, A.S.C., was equally constructive. He said that "Ruling out the out-and-out abuses of the moving-camera technique by inept directors, a properly employed moving-shot can be very good dramatically—though they are almost always difficult photographically. The key to the problem is cooperation: the Cinematographer should school himself to a quicker perception of dramatic values, and the director should try to develop an appreciation of cinematographic problems. Both should make themselves absolutely sure that a perambulating shot is necessary from a dramatic viewpoint, and not undesirable from a pho-

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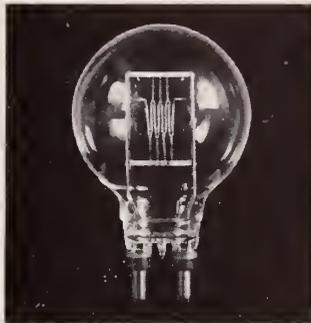
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1,500 and 1,000-watt PS-52. Used in rifle lamps, side lamps and strip units. Also for floodlighting. About 1/10 size.



Movieflood. 2,000-watt P-S 52. Brings out blacks and blues. Primarily for color work. Used in regular 1,500-watt units. (15 hour life). About 1/10 size.



1,000-watt T-20. Used in "Lupe" lamps, utility lamps and occasionally in practical lighting fixtures. About 1/10 size.



500-watt T-20. Used in baby spots and in practical lighting fixtures. Also in amateur lighting units. About 1/6 size.



No. 20 and No. 75 PhotoHash lamps. For special newspaper effects. No. 75 gives more than 3 times the light of the older No. 20. About 1/8 size.



Photoflood lamp No. 1. Has brilliance of ordinary 750-watt lamp. Used in amateur units and in practical lighting units. (2 hour life). About 1/4 size.



New Photoflood lamp No. 4. 1000-watt PS-35. Has about 4 times effectiveness of Photoflood No. 1. Excellent for close-ups. (10 hour life). About 1/7 size.



200-watt T-10. Used in practical lighting fixtures, such as table lamps and floor lamps. About 1/5 size.



Left: 9A. 9.5V. recorder lamp. About 1/6 size. Right 6A. 5V. recorder lamp. About 1/3 size. G-E also makes several other lamps for this work.

THE marvelous, almost phenomenal effects which cinematographers have achieved with lighting are well known.

Working hand in hand with you to help make such results possible, General Electric has made available a great variety of lamps. Are *you* getting the most use from these lighting tools?

This chart suggests some of the ways in which outstanding cinematographers are putting a few of the many  MAZDA lamps to work for them. In the face of this proven flexibility, is it any wonder that studios from coast to coast use  MAZDA lamps for all lighting needs? Incandescent Lamp Dept., General Electric Co., Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC

tagraphic viewpoint, before allowing it to be filmed."

Frank B. Gaad, A.S.C., speaks, as usual, in a very practical way about the problem: "The only excuse for a mov-

ing-camera shot is a story situation that can't be conveyed in any other way. The director and the Cinematographer should study a script carefully before starting production, checking and re-checking

to make absolutely sure that no moving-shot is used unless it is positively vital. Then they should prepare the mechanics of the shot perfectly. The situation should be such that once filmed, the moving-shot is dramatically and technically perfect, with no need for protection-shots of any kind. If you really need the protection-shots, you don't really need the moving-shots; and if the moving-shot is really essential, you haven't any need for protection-shots."

Saoner or later, the problem of the abuse of moving-camera technique must be faced. At present, we are unquestionably wasting time, money and effort on an excess of these shots which do not help their productions at all, and which harm photography and waste valuable footage. When will directors and Cinematographers really join hands and make a united effort to curb this extravagant abuse of a valuable technical and dramatic technique?

Struss Photography "Luxurious"

(Continued from Page 52)

It is perhaps due to the fact that Struss has allowed his mind to dwell and dream upon these theories, that subconsciously, he has been able to grasp the true esthetic arrangements of the subject before him. He does, in no instance, allow the cruder environment to show through, but tries to clothe it with a luxurious aspect that is comparable to the visions of Plotinus, or the mythologies of Hinduism.

Struss came to Hollywood more than fourteen years ago, and has photographed almost every noted star. When he was a portrait photographer in New York, he obtained the idea, from early matian pictures, that the cinematographers of that day really knew but very little of artistic photography. He came west with the determination to make a life study of the art of cinematography. Shortly after his arrival, he obtained a position with Cecil B. De Mille as a still man. Not long after, he was given his first opportunity to prove his ability with the matian picture camera. His progress from that day has been pronounced, until he has become one of the industry's outstanding figures.

Expressing Tempo in Lighting

(Continued from Page 54)

or sequence may strike a dramatic pace more or less independent of the physical pace of its component movements. It is possible to conceive of a scene in which very little physical action occurs, yet which advances the story at break-neck speed—or of one in which a maximum of physical movement produces the minimum of dramatic advancement. In such cases, it is often well to attune

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the photography and lighting more to the dramatic tempo than to the physical.

This borders very closely upon the subject of mood, though it is by no means an exact parallel. As a general rule, the more sombre dramatic moods connote action which is slow in tempo, while the lighter moods evidence a brisker tempo. In much the same way, action which is slow in its dramatic tempo is often best treated with sombre, low-key lightings, while a more swift narrative tempo is better served by brighter, more highly keyed lighting. Melodrama and broad comedy, both of which are dramatically exaggerated, and maintain an exaggerated dramatic as well as physical tempo, require more or less exaggeration in lighting. Screen melodrama, for example, almost always calls for more or less unnatural light-effects, usually with a definite suppression of the middle range of tonal gradations. Broad comedy frequently impels a reversal of this: exaggeratedly natural lightings (if it can be so described), with a minimum of extreme contrasts and a fairly wide range of intermediate tones.

In general, then, it may be concluded that purely physical tempo in lighting is most frequently expressed through alteration of the visual key of lighting, and by manipulation of the brilliance of

the lighting, while the more delicate dramatic tempo is, like mood, revealed more generally through manipulation of the gradational scale, tending to lower tones, with repressed highlights for the slower tempos, and to wider scales for the lighter tempos.

Neither mood nor tempo in lighting should be achieved at the expense of the visual coherence of the production as a whole. From the dramatic viewpoint, no individual scene can be considered as independent of the production; no more should any scene be considered as being unrelated to the photographic coherence of the complete production. Therefore, in normal practice we must sometimes sacrifice effects in lighting and composition which would, individually, be effective contributions to

visual mood or tempo, but which, viewed in their relation to the greater unity of the production, may prove undesirable.

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In the same way, it is often necessary to forego effects which would be visually or dramatically potent, in order to maintain some special type of lighting or other treatment needed for the most favorable presentation of some star. In general, however, lighting may not only be closely attuned to the physical and

dramatic tempo of a film, but serve as a powerful aid to direction and acting in creating and maintaining tempo. Admittedly, this phase of lighting is not so well comprehended as are lighting for mood and character; but it is one which offers much interest to the analytically minded artist.

New Fried Camera for Columbia



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The latest in soundproofed cameras weighs less than 90 lbs., loaded and ready for work, and can be carried by one man. It retains the four-lens turret, and all operating controls of the Mitchell camera, but due to a patented focusing system which eliminates the "throw-over," the entire unit is scarcely larger than an unblimped camera. As the turret is completely removed from all metallic contact with the camera-movement, no glass window is necessary, so that the bugboo of "shooting through glass" is eliminated.

The new device is the first "Reconstruction-Silenced" Mitchell camera, just put into use at the Columbia Studio. The "Reconstruction-Silencing" method, developed by Armin Fried, was discussed in its earlier application to Bell and Howell cameras in the September, 1933, issue of this magazine; the present design, however, has been considerably modified in adapting it to the Mitchell camera, and also incorporates a number of practical improvements suggested by Emil Oster, head of the Columbia Camera Department.

A standard Mitchell camera-box and movement is used, the base-plate and front of the original head being removed. This is placed in a small, lightweight soundproofing case, approximately three inches larger overall than the inner camera-box. All operating controls—shutter adjustment, fade-in and fade-out buttons, etc.—are extended to the outside of this case, and operate in the usual manner.

The regular Mitchell turret is retained, and is placed on a special lens-board at the front of the outer case. This lens-board moves in and out along the optical axis of the lens, thereby eliminating any need to revolve the lenses in focusing. This action is controlled by a knob at

the back of the outer case, and by a supplementary knob, also outside the case, just below the finder. On the shaft of this latter control are five drums, along the edges of which are calibrations for focusing the various lenses; these are enclosed and indirectly illuminated, while sliding shield-sectors block out all scales except the one in use. A disc and pointer of the conventional type, located by this knob-control, provide for emergency calibrations. To focus, a lever at the rear of the case, similar to the regular Mitchell "throw-over" lever, is turned: this slides the front-board forward approximately 1/4", and inserts a reflecting prism, which diverts the image through a focusing system similar to the regular Mitchell one, but mounted on the inside of the "blimp" door. Since the "throw-over" movement is eliminated, the soundproofing case can be made much smaller and lighter than would otherwise be possible.

Any type of camera-motor may be used, as the cover of the right-hand side of the housing is removable. Normally, a standard ERPI motor is used, covered by a plate conforming to its shape. By removing four bolts, this plate may be removed, and any other motor substituted and, if necessary, soundproofed by the use of another cover-plate.

In this design, the movement and its original casing are entirely separate from all other units of the "blimp." The lower part of the "blimp," which contains the focus-operating mechanism, is also acoustically insulated from both movement and "blimp," while the magazines are attached directly to the top of the "blimp" itself and, if necessary, covered with a separate soundproof housing, which opens wide enough so that magazines may be changed more easily than in most "blimps."

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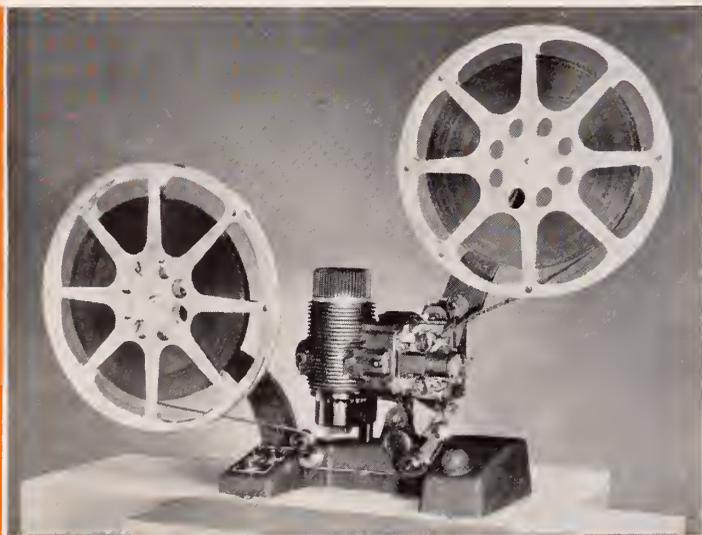
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AMATEUR MOVIE SECTION

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Next Month . . .

- Wm. J. Grace will start a new series of articles discussing the practical side of amateur picture-making.
- There will be several other articles from professionals, and some from amateurs who have observed as they shoot. They will tell you of their experiments and experiences.

Miniature Shots for Your Home Movie

by
Ray Fernstrom, A.S.C.

A FEW years ago, while making some travel-films in Sweden, I took my camera into the Railroad Museum of the Swedish State Railways and made some shots of a wonderful miniature electric railroad which is exhibited there. The train—a perfect model of the regular Swedish expresses—was just about half the size of the little "0" gauge toy trains your little boy got for Christmas; but on the screen it was hard to tell whether I had photographed a miniature or a real train. I was using a professional 35mm camera—but the result would have been the same with 16mm or 8mm film in amateur equipment. And doesn't it start you off on an idea you could apply to your home-movie making?

Of course, most of us can't command the elaborate scenery and accessories that helped to make this shot so effective—but even without them, surprisingly good miniature-shots can be made with ordinary home-movie equipment, and the sort of "miniatures" that are to be had anywhere. Of course, if you have a friend who rides the hobby of making model trains, boats or airplanes, you are well ahead of the game. (Did you know that some of our most distinguished, white-whiskered bankers and business-men make train models and play with toy trains as enthusiastically as any boy?) But even without these, you can do a lot with the ordinary, commercial toys.

Many of the better grade, electric toy trains—especially the smaller "0" gauge—will do excellently for miniature-shots. Some of the toy reproductions of the new streamline trains are marvellously suited to movies. Since most electric trains use a three-rail track, you will get the best results if you use a low camera-angle, which will conceal the third rail. Similarly, your best bet is to make either straight side shots, or to shoot from a $\frac{3}{4}$ angle, with the train coming diagonally across the picture, toward the camera. If you must have a shot of a train coming straight into the camera, make it at a curve, with the train coming lensward down a straight stretch, and curving off just as it fills the screen. This, you see, will allow you to use a lower camera position than otherwise, again concealing that bothersome third rail. For the same reason, you'll find it most convenient to put your train on a bench or table, well off the floor; this, too, will help out in getting your camera low enough.



The train in this photo is only a little taller than a Swedish match box stood on end.

Don't try to use the cheap, clockwork trains, or the cheapest electric varieties, for they aren't, as a rule, made with sufficient attention to scale and detail to be realistic. Another thing, too, many of the better electric trains have a remote-control arrangement, so that you can have them stop, start, or reverse in your shot as you may desire. Also, if possible, get trains that carry little lights inside, and make your shots night-effect scenes. This will help conceal the shortcomings as to backgrounds, etc., and prove much more effective. In making night-effects on reversal film, you'll have to underexpose a good deal, and it will help you if you tell the laboratory people that you are shooting for night effects, and ask them please to refrain from boosting the print up for a day effect.

Keep these shots as simple as possible, using just as few accessories as you can: many of the signals, stations, and the like are not made exactly to scale, and would show up badly on the screen.

Most professional miniature shots are made in slow-motion, often with the camera exposing more than 128 frames per second, for slow-motion smooths out the movement of the miniature, and lends an effect of size to the picture. No amateur cameras will go this fast—and even if they did, there would be a considerable problem in lighting the shots with amateur lighting equipment. So the next-best thing is to run the train a bit slowly (as slow as it will go smoothly), and, if possible, shoot at 24-frame speed—faster, if you can manage the lighting. In some instances you might make these shots outdoors, getting the night effect with a red filter and underexposure.

When it comes to boats and airplanes, the problem is a little bit more complicated. The ordinary toy craft won't do at all, for they aren't nearly so close to scale, and they'll naturally look "toyish" on the screen. But there are lots

(Continued on Page 84)



Enlargements made from Mr. Clardy's 8mm prize-winning picture for 1934.

Filming an 8mm Prize Winner

by
Randolph B. Clardy

Editor's Note: Randolph B. Clardy won the Grand Prize in the American Cinematographer Amateur Movie Contest for 1934. He also won the Scenario prize. In 1933 he won the scenario prize and the prize for photography. On both occasions he used an 8mm camera. For this reason we believe Mr. Clardy's story will be interesting to thousands of readers.

FOUR scenarios were written completely before the final story was prepared. As a hint to the wise—the first three were more complex as to situations and characters, while "New Horizon" was as simple as it could be made with only three characters—and it was a handful at that for a lone cameraman directing his own.

"New Horizon" is the story of an American farm girl in love with the son of a neighboring farmer. Her father, crippled and unable to help with the work of the farm, bitterly objects to the girl's marriage. His dominating personality keeps her tied to the farm doing heavy work that should be a man's job. The scenes follow the girl

through her early morning outdoor chores and after breakfast she stops to rest on the porch where she tells her father again of her wish to marry. The father in a violent rage declares she shall never marry the boy. Physically and mentally weighted down, the girl, while working in the hayfield, meets the boy only to part once more with the situation seemingly hopeless. That afternoon when the girl arrives at the house she sees her father struck down by a horse which he is brutally tormenting, and realizing he is dead, the girl, with tears streaming down her face, runs across the fields and over the hill separating the two farms, to the boy she loves—disappearing into the "New Horizon" of her life. The reel starts with a man taking a book from a shelf at the fireside, in which appear the titles and cast, lap-dissolving from the first page of the story into the opening scene of the farm. At the close of the picture, the final scene of the girl on the hill dissolves back into the book with a fade-out as the man replaces the book on the mantel.

Here's what may be considered an important suggestion to those writing original scenarios for production: Converse with someone (if they can take it) and tell them your thoughts. Your own ideas will be stimulated as well as those of the person you are conversing with. In "New Horizon" I started with the girl and her father (having these characters available) and was stumped for an idea for the boy. Here during a discussion, my wife suggested that he be a neighboring boy in love with the girl—and so he was. That suggestion completed the skeleton of the story and the details were then filled in.

Inasmuch as "New Horizon" was based on the life of an American farm girl, it is an interesting paradox that Miss Leslie Clarke, who played the part, was a very typical Canadian girl visiting in California from Toronto, Canada—and with the Editor's consent I should like to give credit here to Miss Clarke for her exceptional cooperation and able interpretation of the leading character in the story.

Due to the dramatic theme of the story, practically all of the scenes were kept in a low key. A "G" filter was used on the exterior scenes and tests were made to get the correct low exposure. Three lap-dissolves were used and obtained by fading out, timing the shots and running through the camera twice to double expose the laps. A Harrison sun-shade and their graduated neutral density fading glass made the fades possible. Their regular professional diffusion disks were used on all scenes; a number three for distance and a number four for close-ups. The "G" filter helped restore the contrast usually lacking with diffusion. The characters used a heavy shade of studio make-up to offset the effect of the "G" filter. My Model 60 f:1.9 Cine 8 Camera was used almost entirely on a homemade platform placed on the ground, as Miss Clarke was small and low camera angles made her appear taller. This also gave an opportunity for unusual angles and, where an undesirable background was in evidence, the plain blue sky was used instead. A number of silver covered reflectors were used, supported by uprights, so that the light source would be from a higher and more pleasing angle. These made it possible to use back lighting and to light up the background details where needed.

All rehearsing was done on location before the camera, and a second shot was made if necessary. I tried to forget film footage and shot with more freedom. Only four speaking titles were used.

I could have hoped for no greater honor than to have won for a second time the A.S.C. International Contest, as I feel this is the highest compliment an amateur can receive—to say nothing of the cash award.

Let's Talk

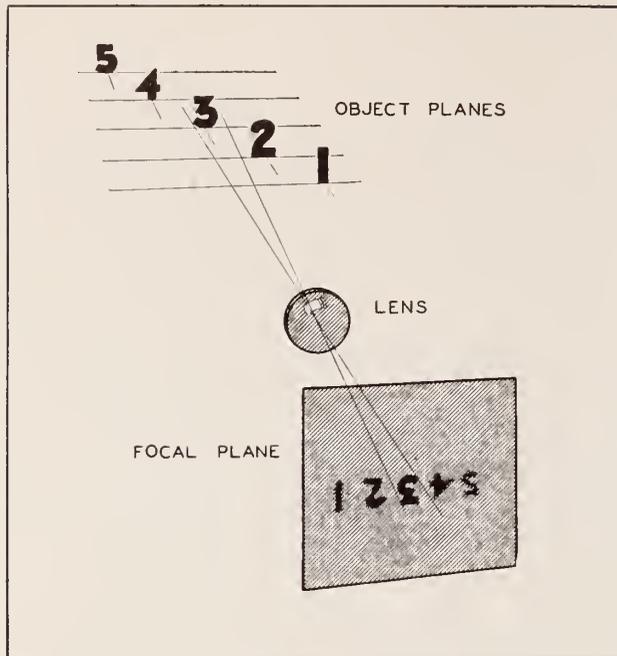


Fig. 10. Depth of focus or depth of field—it all means "how much is in sharp focus."

SHOULD you read or hear somewhere that "There is no such thing as 'distortion' in this day of perfected lenses," you might catalog the author of that statement either as one who isn't thoroughly versed in his subject or that he makes an unfortunate choice of phraseology. Either he doesn't know what he is talking about, or he hasn't convincingly qualified his statement.

"Distortion," so the dictionary tells us, is derived from two Latin words, "dis" (away) and "tortus" (to twist), and means "to twist or turn or pervert from the natural form or shape." Its use in cine work is by no means restricted to faults of lenses as they are designed or made—it may just as well be applied to the manner of using the lenses. After all, an image can just as easily be distorted by improper application of the lens as by a poor lens itself. If the image isn't exactly similar to the original scene, then it is distorted.

It is difficult, in a medium of words and two-dimensional illustrations, to drive home in a simple and convincing manner the truths underlying many things, and optical facts are no exception. However, suppose we make at least a try at drawing aside one or two of the many veils of misunderstanding which are draped about optical phenomena as regards "distortion."

More as a reminder than as a statement which we agree to be true, let's recall the fact that "it is impossible to reproduce a three-dimensional object on a two-dimensional surface in such a way as to entirely satisfy the binocular vision of the normal human being." This assumes, of course, a camera of the single lens type, not a stereo camera.

If all observers had but one eye, more nearly perfect reproduction would be possible, for the feeling of perspective or spatial relationship of each object plane could be attained by using a lens stop giving approximately the same depth of focus as the eye would have under the same conditions. In other words, when we look at an object with one eye, other objects before and behind the principal object are out of focus in proportion to their distances from the plane of the principal object, and if the lens stop which will produce this same blurring of objects other than the

principal object is used, very nearly perfect reproduction for a one-eyed observer can be approached.

If you remember, it was this very thought of using a lens fairly wide open to secure shallow depth of focus for pseudo-depth effect which I mentioned in the August CINETRICKS. Even tho most of our audiences are in possession of sight in both eyes, the illusion of depth thus gained simulates perspective quality.

Perhaps you've become just a bit weary of hearing the term "depth of focus" so many times, in almost every cine article your eye scans, but just to close the incident for the time being, let's glance at figure 10. Depth of focus is that axial distance in which objects are imaged sufficiently sharp in focus. Depth of field is the axial distance (out in front) between which all objects appear sufficiently sharp. The two terms are confusing—there should be but one in use, possibly "depth of focus." Altho depth of focus refers to the axial "sharp enough" distance at the film and depth of field the axial "sharp enough" distance out in the object space, it all amounts to the same thing—how much of the object space will be in "sharp enough" focus on the film.

In figure 10 the object 3 is sharply focused on the film. If 2 and 4 are sufficiently sharp, then you'd say the depth of field is between planes 2 and 4. The term "sufficiently sharp" cannot be quantitatively defined; it will depend entirely on your own ideas of sharpness.

Now for an aspect of cine work (or still work, for that matter) which is seldom discussed—perspective. I say "seldom," for I of course haven't read everything, but personally I have never seen it discussed. Perhaps you have, and if you've seen the matter discussed in articles you're one up on me. It's something I've felt rather than known ever since I made my first 3" telephoto shot, and I've finally run across an explanation of the effect so simple that it's astounding.

Put your finger on the beginning of this paragraph and let your eyes wander to figure 11. Study the illustration a bit, then read on. Suppose that instead of placing the lens where it is shown, we place an eye at the location. Also suppose that we replace for a moment the film or photo with a plate of clear glass. Keeping our eye steady in position we will sketch on the glass an "image" of the object.

Now suppose we put things back as they were, the lens and photo as shown (only the photo would of course be placed on the other side of the lens) and snap a picture. The image recorded on the photo would be identical with the image we sketched on the glass plate.

If, however, we had sketched the image with our eye placed as in figure 11 and had taken a photo of the same object with the lens as it is shown placed in the figure 11 illustration, the two images would no longer be identical. The photographed image would show the object as in "image by lens" and that sketched would appear as in "image as seen by eye." Obviously, distortion has crept in, for the two images aren't identical.

If we had viewed the photograph with our eye at the same distance from the photo as the lens was when it took

About Lenses

Projection and Apparent Perspective Distortion

by

Wm. J. Grace

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the picture, there would have been no distortion, would there? Or, if the picture had been made with the lens at the distance from the film that the eye would view the print, there would still be no distortion—right?

It appears, then, that the only way a picture may be viewed to secure the same perspective is to place the eye at a distance such that the picture subtends the same angle at the eye as the negative film did at the lens. It isn't necessary that the eye be placed at the same position as the lens was when the picture was made if the same angle is subtended. For instance, if we take a still picture $3\frac{1}{4}$ " wide with a 5" focal length lens, true perspective is apparent only when we view the print at 5 inches or enlarge the picture to $6\frac{1}{2}$ " wide and view it at the normal reading distance of 10".

The same thing is true in viewing motion pictures. You've noticed, if you are observant, that in 16mm work the 1" lens is regarded as the "normal" lens for the cam-

era, but that projectors almost invariably use a 2" lens. Do you know why this is done? Because in home projection (as well as in the theatre) the center of the audience is about halfway between projector and screen, and by using a 2" projection lens the screen at the eye of the audience subtends approximately the same angle as the 1" lens did when it took the picture.

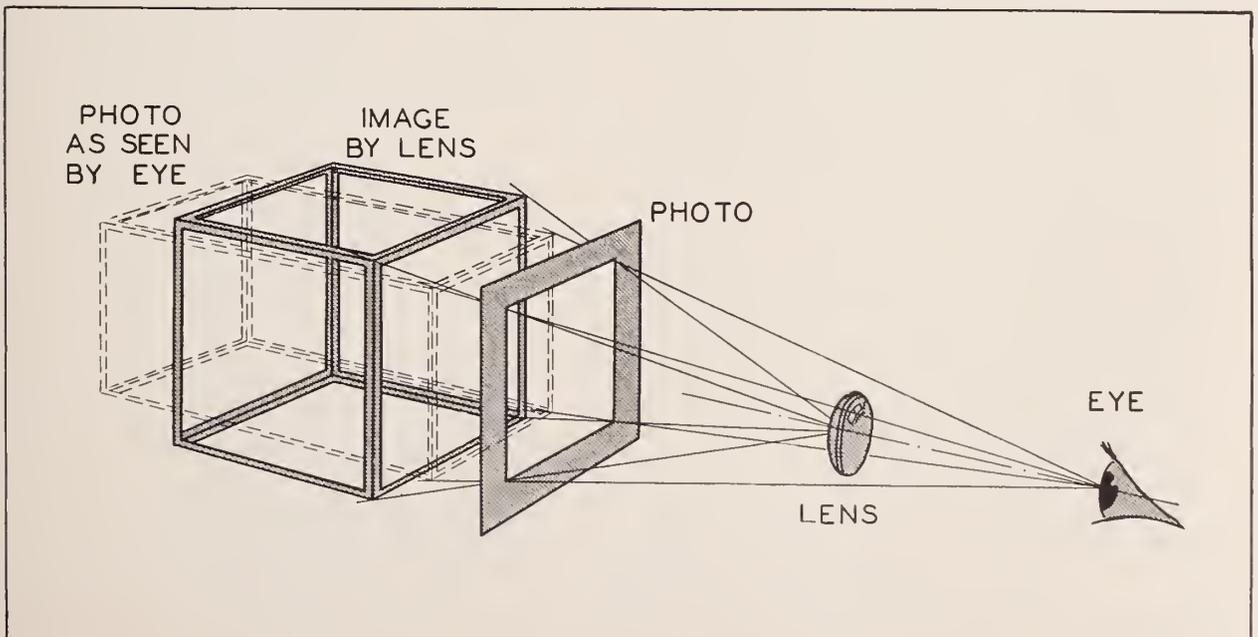
Granting, then, that we should sit halfway between projector and screen and use a 2" lens on the projector for true perspective viewing of shots made with the 1" camera lens, what's going to happen to the perspective when a telephoto shot or a wide-angle shot appears on the screen? The perspective is going to be distorted. Haven't you noticed scenes in which some person or object coming toward the camera appeared to merely go thru the motions of approaching without getting much bigger in size? Those were telephoto shots, of course, and because you weren't viewing them at the right distance, the scene was unnatural. The opposite effect is noticeable with wide-angle shots—two or three steps of an approaching person bring him toward you unbelievably quickly.

Why put up with such distortion in your work? Well, for one thing, it's often impossible to approach an object close enough to get a large enough picture, so a telephoto lens is slipped on the camera. Conversely, when operating in cramped quarters we can't back off enough to include enough area, so the wide angle lens goes into action. If somehow a camera angle can be so selected that moving objects do not approach or withdraw from the camera, the distortion of perspective isn't so noticeable.

Then there are times and places where the clever cinematographer deliberately employs the distortion of perspective for reasons of composition or even for comedy. With a telephoto of proper focal length, a background suitable for the subject but too distant for good composition can literally be brought up to the subject. The size of the subject, of course, is kept to the desired proportions by his position distance from the camera. For example, a mountain background might appear too small with the normal lens, but if the subject is backed up to a distance in proportion to the lens focal length, the background may be enlarged and yet the subject size remain the same. In

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Fig. 11. Viewing a picture at a different included angle than the taking angle introduces distortion of perspective.





At top—Leica photo made by Oskar Barnack, the inventor of that camera, in 1914. Below is a reproduction of the first two cameras made by Mr. Barnack. The above photo was made with one of these cameras.

THIS year marks the twenty-first birthday of the brain-child of Oskar Barnack. Today, after its periods of growing pains, education, and sowing of a few wild exposures, it is a fully grown camera, ready to shoulder its share of the serious problems, encountered in the world of photography.

Like a proud father, Oskar Barnack has been content to remain unobtrusively in the background, while the world has acclaimed his prodigy. From this reticence, he has emerged only to add some improvement or accessory that will further increase the many-fold accomplishments of his camera.

Although Oskar Barnack is comparatively unknown, the influence that he has had upon the trend of modern photography has been phenomenal. Since the inception of photography, only two other individuals have so influenced the general trend of this art, and they have been L. J. M. Daguerre and George Eastman.

Daguerre, with the Daguerreotype, gave the world its first popular form of photography and Eastman, with the Kodak and "You press the button—we do the rest," made potential cameramen of everyone. Now with the great concentration that is being made upon miniature photography, it is time that we should know more of this man, who with his little Leica made the snap—"shot that was heard around the world."

The life of Oskar Barnack has been very interesting. Like so many other biographies of famous men, this one should really start off by saying that Herr Barnack was born amid humble circumstances. However, I do not find this fact in any of the information that I have received from Germany. This information does, however, emphasize a typical German trait for when young Barnack expressed the desire to become a landscape painter, his father said to him, "You had better learn a decent handicraft." So little Barnack went to Berlin and became an apprentice in the mechanical workshop of Julius Lampe. This was but a small workshop with but only one journeyman and one apprentice; Barnack now became the second one.

Herr Lampe specialized in the manufacture of little astronomical devices which were driven by clockworks and which displayed in a clever manner the sun, the moon, the stars, and the planets which rotated, ascended or descended

The Leica

on an artificial sky. Numerous tables and figures accompanied these instruments, recording all of the details just as they were happening in reality, in the course of cosmic events.

So impressed was he by all of this, little Barnack lost all desire to become a landscape painter. His goal now was that of an astronomer. He applied himself so diligently, in performing his tasks, that Herr Lampe finally reduced his apprenticeship by six months, maintaining that he had finished learning and advising him to go out and see the world and to make good use of his knowledge.

During his wanderings, the journeyman Barnack found a new occupation in a little town in Saxony. His new employer manufactured calculating and adding machines. Never before in his life had Barnack seen such a calculating machine, for even at that time, it was able to do addition, subtraction, multiplication, and division. One of his early tasks was to take one of these machines apart in order to give it a thorough overhauling and cleaning. His new boss proposed to give him a helping hand when it came to reassembling it, for there was such a maze of wheels, gears and screws which had to be put together. However, by the time that his boss returned, the machine stood there completely reassembled. Not only was it complete in its outer appearance, but it rattled down divisions, additions, etc., as reliably as before. Barnack's new employer was certainly taken by surprise and the young man was rewarded accordingly. This knack of being able to solve intricate mechanical problems was to come in very handy for him, during the many hard years that followed, in the mechanical-optical industry.

About this time, Barnack as a passionate nature-lover roamed about the beautiful Thuringian country, in search of picturesque spots to photograph. Everyone knows what it is, to carry around a heavy 13x18cm camera, with a tripod and six double plate-holders. Surely, thought Barnack, there must be a lighter and more convenient way for making pictures. Accordingly, he got busy and devised a contraption that would enable him to make a dozen or more pictures on one plate. However, in his attempt to enlarge these, he met many obstacles as the grain was flourishing lavishly. His experiments gradually became a thing of the past, yet they were the first spark which in after years started to glow, anew.

It was in 1911 when Oskar Barnack came to the Leitz Works, in Wetzlar, Germany. He was assigned to the microscope department of the organization and he fully succeeded in solving the most intricate construction work that was given to him. About this time, cinematography, which was then very young, attracted Barnack's fancy. So as a side line Barnack tried to build motion picture cameras. As there were already a number of foreign patents in existence, he constructed his first experimental model of aluminum instead of wood, as were those that were already on the market. He took his first movie film, which after-

Comes of Age---

An Autobiography

by
C. W. D. Slifer, A.S.C.

wards became well known as "Leitz-Film." His desire to become an astronomer, had long since been forgotten. His new ambition was to become a cinematographer.

Of course, everything was new to him; even the correct exposure to give his motion picture films. He had to pay for his experiments and very highly at that, for it is a very expensive matter to shoot 200 feet of negative and then later discover, that it had been partly "over" or "under" exposed. Consequently, nothing was more important to him than to create a reliable exposure-meter. He foresaw the value of being able to take and to develop a number of small pictures, made at different lens stops. From this strip he could ascertain the correct exposure for his motion picture camera. Accordingly he set about building a camera with a fixed shutter speed of 1/40th second, this being in accordance with the then standard exposure for motion picture cameras. It had the coupling of shutter and film transport, preventing double exposures, as well as the collapsible feature of the lenses. It was a roll-film camera which held approximately six feet of film and with a decisive step towards the double movie frame size picture. **THUS THE FIRST LEICA CAMERA WAS BORN.** As related by Oskar Barnack, this all sounds very simple; actually it wasn't.

(Oddly enough, some years later and after the Leica had achieved considerable fame as a still camera, its value as a test camera for motion picture purposes was again rediscovered in Hollywood.)

Two cameras of the original type existed, one in the hands of Oskar Barnack and the other was taken by the Senior Head of the Leitz Works as a companion on his trip to the United States. Shortly before the War, Dr. Leitz returned to Germany and judging from the results that he obtained with the camera, he was convinced that this little instrument represented something that "had to be kept in mind."

This was in 1914 and among the many pictures taken by Barnack, there is one of special interest and of all time significance, "the second mobilization day." A picture of the type that we now designate as candid and one which so vividly depicts the seriousness of those days that it is to be considered as a document of a never-to-be-forgotten event of twenty-one years ago.



Above—Picture of Oskar Barnack, designer of the Leica Camera, taken in 1913 showing him working on a lathe. Below is an early Leica photo taken in 1914 by Barnack of his daughter.

Naturally during the War the further development of the camera came to a stand-still, for there were more

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Music for Your Movies

by
William Stull, A.S.C.

REMEMBER how your interest in a picture used to drag when, back in the old silent-picture days, you dropped into a theatre during the "supper show," when both orchestra and organist were off duty—and how much better the film seemed as soon as the music started? Home-movie audiences react the same way. Even an unusually good picture, if presented only in the clattery silence of ordinary projection, won't seem half as interesting as it would if supported by a pleasing musical accompaniment; and the average home-movie—the sort that you and I and the man next door make—will find audiences a whole lot friendlier and more appreciative if served with music.

Now that we're beginning to talk about music with movies, don't turn the page and wish you could afford a talkie outfit! This isn't that kind of an idea at all: it doesn't require a nickel's worth of special talkie equipment, or anything that can't be found in the average home. In spite of the radio, most homes still include a phonograph; and that phonograph can easily be used to accompany home movies. All you need is a record that will fit your picture. Probably, you've got it already; at any rate, plenty of them are available at any music store. A standard 12-inch record will "sound" about 200 feet of 16mm film, while a 10-inch disc will take care of slightly over 100 feet.

The possibilities of film-and-gramophone home soundies are unlimited. First of all, of course, you can do a great deal by fitting sound to the films you have already made. Just to suggest a few of the possible record-picture combinations, I'll begin with mentioning Ketelbey's "By Blue Hawaiian Waters" (British Columbia record No. 9864). This seems ready-made to accompany the reel you made in Honolulu. It begins with a dreamy, Hawaiianesque theme, which perfectly suits those shots you made of the scenery and the native life of the islands; then it changes to an excited, bustling theme—none the less retaining something of the hula—which perfectly suits the shots of modern, Americanized Honolulu. The same composer's "In A Monastery Garden" (available in a variety of arrangements, one of the best of which is Brunswick No. 20067) is ideal for a reel dealing with the California Missions. If you have a reel of seaside studies, especially shots of stormy surf breaking over rocks, try "The Storm" (Columbia No. 50252-D), an excellent organ record which makes you feel as well as hear the roar of the storm-driven surf.

What's that? A winter-sports reel? Try Victor No.



35798—the old standby, "The Skaters Waltz." This record has an unusually vivid atmosphere, and lends itself to most all sports, including skating, sleighing, skiing, ski-jumping, and so on.

Did you bring back a reel from your trip to Mexico? Parlophon record B-48231, "Blue Pavilion," seems well suited to a short Mexican subject, even including an introduction long enough to fit the explanatory opening titles we see on such films.

In general, the range of music available for home-movie scoring is almost endless: it is bounded only by your own musical taste, and the range of your film-subjects. You can have any type of music you care for; I would suggest, however, that dance-music is usually a bit too repetitious, and often too quick-tempoed, to be of use with most films. Also, it is advisable to use records that have a reasonably high volume, as the music must compete with the clatter of the projector. Selections with definitely-marked rhythms and diversified instrumentation will usually synchronize better than less positive pieces: and whenever it is possible, use records which have here and there points which you can accurately synchronize with your film; this makes projection easier and more interesting.

Inevitably, the next step beyond this is to try making a film definitely to fit some record. It isn't half as hard as it sounds, either. Masaji Imaizumi, of Tokio, Japan, entered two such films in the recent American Cinematographer Contest. One of them, "Super Express," is an example of what an amateur can do in making his own sound pictures. It opens with two shots—a long-shot and a closeup—of a railway guard blowing his whistle and signalling the train to start. The record opens with the same two whistle-blasts, followed by a rhythmic puffing as the engine heaves slowly forward, blending into a musical interpretation of the staccato rush and rattle of the train's headlong flight, pleasingly varied as the scenes on the screen show the train pulling out of town and rushing on its journey, over hills, through tunnels, across bridges, and so on, interspersed with more intimate shots showing the

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Continuity for Reversed Motion

by
J. Dickinson Reed

ONE of the first and simplest tricks learned by cinefilmmakers is producing reversed motion by turning the camera upside-down. It certainly gives amusing results, but after the first few shots made this way, most of us abandon it, because, after all, there aren't many ways we can legitimately use the trick in our filming. Professional cinematographers, on the other hand, frequently use this same trick as a means of filming action which would normally be impossible. And the idea can be applied just as well to amateur films; so here's a "backyard movie" story written around the reversed-motion idea!

MAIN TITLE:

JUMPING JACK
Cast

JackA small boy.
Bill, Dick, Joe.....His pals.
Jock's Fother.....
Butch, the neighborhood "tough guy;" Jack's friends,
neighbor boys, etc.

Scene 1. Long-shot, exterior of Jock's home. Jack and his father come out of the front door, and walk toward the family car in the driveway. Jack is obviously excited.

Scene 2. Medium-shot. Jock and his father climb into the car, and drive off.

Scene 3. Long-shot in the street, as the car comes out of the drive and swings down the street. FADE OUT.

Scene 4. FADE IN. Long-shot at a stadium entrance; Jack and his father enter, and go through the gate.

Scene 5. Medium-shot. Jack and his father settle themselves in their seats inside the stadium. Jack is watching something on the field with great interest.

Scenes 6-15. Stock-shots of any track-meet, especially the high-jumps. Intercut ad lib with close-ups of Jack, showing excitement.

Scene 16. Medium-shot of Jack and his father, preparing to leave the stadium. FADE OUT.

Scene 17. FADE IN. Long-shot. Jack and his pals are busy in the back yard, setting up hurdles, bars, etc., for their own track meet.

Scene 18. Medium-shot. Jack, putting the finishing touches on a jumping bar, stops to pantomime how the athletes high-jumped.

Scene 19. Close-up of Butch, looking over the fence, and talking.

Scene 20. Close-up of Jack. He stops in the middle of a gesture, and looks toward Butch.

Scene 21. Close-up of Butch; same as Scene 19.

Scene 22. Medium-shot of Jack and his pals; clearly, they don't like Butch, but are rather afraid of the bigger boy.

Scene 23. Long-shot. Butch vaults over the fence, and swaggers up to the boys.

Scene 24. Medium-shot of Butch. He looks contemptuously at the apparatus the boys have made, and speaks.

Title: "I'll show youse how to jump!"

Scene 25. Long-shot. The bar is in place, much higher than any of the smaller boys could jump; Butch clears it with ease. Jack and his friends are huddled on the ground, looking very dejected.

Scene 26. Medium-shot. Butch readjusts the bar on the very highest peg.

Scene 27. Long-shot. Butch tries to clear the bar at its new height, but cannot; his legs catch it, and as he falls, it breaks. He gets up, picks up the broken bar, looks at it, then throws it down and walks away.

Scene 28. Close medium-shot of Jack; he holds the broken bar in his hand, looks at it, then looks up and shakes his fist after Butch. He speaks.

Title: "Someday I'll show him—!"

Scene 29. Close-up of Jack, as he finishes speaking. FADE OUT.

Scene 30. FADE IN. Long-shot, on a street corner. Jack and his pals are talking. They see Butch and some of his cronies coming down the street. Jack motions his friends to hide around the corner.

Scene 31. Butch and his friends have reached Jack, who stops them. While Jack and Butch talk, Bill slips out and drops on his hands and knees behind Butch. Jack gives Butch a quick push, and he topples over. Jack waves derisively at Butch, and starts to run. Butch scrambles up and follows, while the rest of the boys join the chase.

Scene 32. Long-shot. Jack comes streaking down the street. Shoot this at 8 frames per second.

Scene 33. Same as Scene 32; Butch and the rest run across the picture, following Jack. Shoot this at 32 or 48 frames per second, so that they appear to move slowly.

(NOTE: If you wish, you can repeat these scenes several times on different locations.)

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Synchronizing Sound Cartoons

by

Walter Lantz

Head of Cartoon Dept., Universal Studios.

ANIMATED cartoons require much more exact synchronization than do normal talking pictures. Synchronizing errors which would pass unnoticed in an ordinary talking picture become glaringly obvious in a sound cartoon. This is primarily due to the fact that modern sound cartoons are of a definitely rhythmic structure; the music and sound-effects set a positive rhythm, and the pictured action moves in precise accord. In the ordinary talkie, picture and sound can often be several frames out of step without appearing noticeably "out of synk"; but if on an animated cartoon is more than three frames "out of synk," it becomes unpleasantly evident even to the general public. In actual practice we regard an error of one frame between picture and sound-track as the maximum permissible.

For this reason, we plan our cartoons with great attention to following out a definitely rhythmic scheme in action and music, and during the actual production of the cartoon we maintain an ever-increasing chain of safeguards to ensure that drawing and music keep in step from start to finish.

The first step is the story-idea. This almost invariably concerns the action, rather than the music. Story-conferences, not too unlike those held over a dramatic picture, elaborate this idea, and give the Musical Director his start on the problem of "sounding" the cartoon. Once the story has begun to jell, we go into heavy conferences with the Musical Director, and begin to plot out the musical side of the picture. All of our music, incidentally, is composed specifically for our pictures; we have found it unwise to buy popular songs or descriptive compositions from outside composers, for in addition to the fact that a separate royalty can be charged for each additional "cut" scored with the piece, there is also the question of "dramatizing" the composition—a legal technicality which leaves a loophole for further attacks on undernourished cartoon budgets.

At this point, we begin to depart from conventional standards of picture-making. We have found it practical to take as our basic unit, not a matter of frames or film-footage, but the bar of music. Originally, we wrote and recorded all our music so that a new bar was begun every second, giving us (at the standard sound-speed of 24 frames per second) 24 frames of cartooned action to each bar of music.

This, however, did not prove quite flexible enough: at

CARTOON No. 685.

TITLE THE WAX WORKS

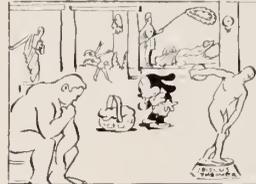
SCENE No. 5 same as 3.



BARS.

21. Oswald in doorway after woman leaves scene. He looks out towards camera..then to right, then left..registers surprise with a double take as he sees basket at his feet. He picks up basket takes it inside..door closes.
22.
23.
24.
25.
26.
27.
28.

SCENE No. 6. Inside Museum--Medium shot--Museum figures in Fg. and Bg.



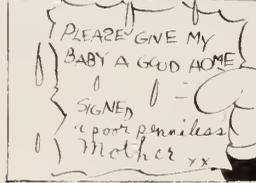
29. Oswald looking at basket, he scratches his head, basket animates as if alive..Oswald registers surprise mingled with slight fright, reaches for covering of the basket.
30.
31.
32.
33.
34.
35.
36.

SCENE No. 7. Cl. Inside of Basket.



37. Cover goes back on basket revealing sleeping child, baby is discovered with toe in his mouth
38.
39.
40. Oswalds hand comes into scene takes note that is pinned to the childs bib.
41.
42.
43.
44.

SCENE No. 8. Cl. of Note.



45. Tears fall on note... sobs and sniffs are heard.
46.
47.
48.
49.
50.

Above a sample page of a script prepared for an Animated Cartoon. Note that bars of music are indicated for each scene.

times, we might want a faster tempo, or a slower one. Therefore, we now use three standard tempos: 20 frames to the bar, 24 frames to the bar, and 32 frames to the bar. As a rule, we begin our cartoons at the 32-frame tempo, increase midway to the 24-frame tempo, and finish briskly at the 20-frame tempo.

These standards make the matter of synchronizing the drawings and the music relatively easy. Naturally, if we allowed one frame of film to each drawing, we would have, for example, 24 drawings to each bar of music, and we would know that at every 25th drawing, the sound-track would be starting a new bar of music. In actual practice, however, the number of frames allowed each drawing varies greatly; sometimes, for quick action, we will use one frame per drawing, while at other times, when a character is to hold an expression, for instance, the same drawing may run for seven or eight frames; the average, however, is two frames per drawing. Therefore, we can pretty definitely say that the 20-tempo means 10 drawings to the bar; the 24-tempo, 12 to the bar; and the 32-tempo, 16 to the bar.

Next, we prepare the scenario, which is the first definite step in interlocking our drawings and music. At one side of the page, I make a little sketch that gives a rough idea of the scene. Beside it, on the right-hand side of the sheet, is a written description of both action and sound, including dialog and sound-effects (if any). In between is a column of figures, showing just what bars are allotted to the scene. Thus if, for example, a scene covers bars No. 1 to 10, the animator knows that at the 20-tempo

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WHEELS OF INDUSTRY

Maurer Joins Berndt

● Eric Berndt, long an important factor in the 16mm field, will widen the scope of his activities with the addition of John M. Maurer to his company. This new association changes the corporate name of the company to The Berndt-Maurer Corp.

Mr. Maurer is well known in the engineering field of sound recording and reproduction. He is said to be one of the outstanding authorities on the subject of Optics as it affects sound picture recording, and Chemistry applied to film manufacture and processing. Maurer has done a great deal of research on the subjects mentioned, especially optics. Under his association with Berndt it is his plan to manufacture new devices that he has invented for both the 16mm and 35mm field.

New Harrison Filter

● According to an announcement from Harrison & Harrison, manufacturer of light and effect filters, that company has just completed for the market a 3-in-1 multi filter. This is composed of an Aero 3, G and 23A Filter contained in a single oblong filter. It comes in two sizes $1\frac{1}{2}$ " wide and $1\frac{1}{4}$ " wide.

New Bell & Howell Projector

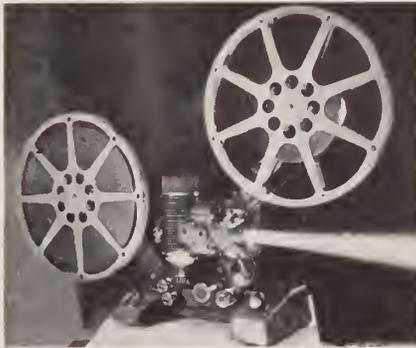
● An innovation in 16mm movie projectors is Filmo Model 129, just announced by Bell & Howell.

This model is different in appearance from any other movie projector. It has a low center of gravity, achieved by a low "streamlined" base, and a new "fore and aft" placing of the reels—a desirable feature, especially in view of the fact that the projector accommodates 1600-foot reels which permit a one-hour program without a stop for rethreading.

A 750-watt lamp, with the high efficiency optical system of this projector, provides ample illumination for all occasions except where the maximum possible screen size and brilliance are required, in which case the new 16mm 1000-watt Filmo Auditorium projector is recommended. For use in the home, school, church, and club, and in halls

and auditoriums of moderate size, Model 129 is ideal. It is claimed brilliant pictures up to 12 feet wide, or even larger, can readily be projected.

This projector comes in two types—one being a no-resistance type, using a Cooke 2-inch lens and a 750-watt lamp operating directly from the line current; the other having a variable resistance unit and voltmeter used in connection with a 100-volt 750-watt lamp. This type employs the extremely fast 2-inch f:1.65 lens, increasing still further its effective illumination.



It is stated efficient lamp economy is achieved by suiting the illumination to the need. In the no-resistance type, the 750-watt lamp may be replaced, when less illumination is desired, by a 300-, 400-, or 500-watt line voltage lamp. In the variable resistance type illumination may be reduced and lamp life prolonged by setting the resistance lever to give the lamp less than the normal 100-volt load. Or a 400- or 500-watt lamp may be used.

Lens interchangeability is possible with the 129. The lens which is standard equipment with this model may be replaced with any one of a full range of extra lenses to meet special requirements—from the wide-angle 0.64-inch for close quarters to the 4-inch for long throws.

Among other features of the Filmo 129 are a two-way gear-operated tilt, manual framer, fast power rewind, convenient pilot lamp, adequate cooling system, provision for still projection, reverse switch, and take-up snubber to prevent film breakage.

Rapid Winder for Leica

● The Leica camera has always been noted for its speed in making successive exposures. E. Leitz, Inc., announces a device which permits even greater speed when making a series of photographs in rapid succession. The new device is known as the Rapid Winder, and consists of a polished metal cap which fits over the winding knob of the Leica.

By means of a thin, flexible steel cable which terminates at a metal ring which fits slipped over the finger, the shutter and film are adjusted for the next exposure by pulling on the ring. This action rotates the winding knob of the camera. When completely wound, the steel cable is permitted to slide back into the cap where, by a spring action, it coils, ready for the next exposure. In short, exposures can be made with the Leica and this new Rapid Winder as quickly as the finger can pull the ring—one straight movement, outward, and the camera is ready for the next picture. Only a fraction of a second is needed with this device to set the camera.

News, sport, candid, and aerial photographers will be especially benefited by it. As it is attached and detached to the Leica camera with ease, it can be left on the camera, or, if the owner desires, can be attached and used only on certain occasions where it is particularly indicated by the work at hand.

New Agfa Leader

● The Agfa Ansco Film Co. has inaugurated a new leader on their 16mm film. Previously film being returned from their processing plant had the green leader with the name Agfa in the center. An addition has been made to this. The year has been added. This permits you to identify immediately the year in which you made your picture.

Photo Spot-Flood

● The Photolite Company, who recently announced their Photo Spot light, now announce an addition to this accessory in the way of a parabolic reflector which is substituted for the front condenser on this light. The lights can be secured with both pieces of equipment.

C I N E M A

The New Pictures

Forsaking All Others (Metro-Goldwyn-Mayer). Dill Todd (Robert Montgomery) leaves his fiancée, Mary Clay (Joan Crawford), waiting at the church while he elopes with his old mistress. The best man, Jeff Williams (Clark Gable), then spansks Mary with a hairbrush. These antics are intended to suggest that the three characters are urban partisans filled with charm and worldly wisdom. Lest the partisans in doubt, they speak freely in hard-boiled whimsy. When Jeff calls on Mary, he kisses her and says: "Perfectly beautiful outside. How inside?" Mary: "Sweet little." This means that Mary is a virgin. Dill.

When she sees Dill again, Mary finds out her mistake. She and Dill are soon up to their old tricks, consulting the proprietors of roadside restaurants, wrecking Rolls-Royce roadsters, and imposing on their friends. When they spend a night together, Dill further establishes his character as a sophisticate by catching cold, getting burned and sleeping alone on a covered sofa. His bride divorces him and he is on the point of settling down with Mary after all, when she discovers she's wrong again. Jeff Williams is the man she loves. They go off to Spain together, leaving Dill puzzled on the pier.

Forsaking All Others should be offered as a self-sufficient comedy of manners in a reflection less on Hollywood than on the portion of the public which it will delight. Adapted from an unsuccessful play in which Tallulah Bankhead performed (TIME, March 13, 1933), produced with Metro-Goldwyn-Mayer's finest



CRAWFORD & MONTGOMERY
... up to their old tricks.

trimmings, it contains a few bits of expert comedy by Charles Butterworth. Worst shot: Dill Todd giving Mary Clay a ride on the handlebars of a borrowed bicycle landing in 'a pigpen.

I've Been Around (Universal). Rochelle Hudson is the society girl to whom Chester Morris gets engaged before she falls in love with G. P. Huntley, a nasal newcomer whose sallow face and English twang should make him successful as a

cad. When Miss Hudson makes the discovery that Huntley has been after her money she marries Morris on the rebound, but makes the mistake of explaining this to him. He walks out. When he comes back, after the usual Comstockery reveal, Huntley has dropped in for a drink and Morris almost through the door again when Miss Hudson swallows something in the bathroom. Thereupon she undergoes the fastest collapse from poison ever photographed.

The Little Minister (RKO). Quality, usually devoid of whimsy, admirers of Sir James Barrington, farming in his prime, is probable to produce upon the scene.

Little Minister tracks the life of the novel from which it was adapted. It attempts, therefore, to substitute charms of its own. Because of the dexterity with which Director Richard Leander handled the story, and the peculiar grace of Katharine Hepburn in the rôle of the heroine, the picture created in 1907, the substitution is entirely satisfactory.

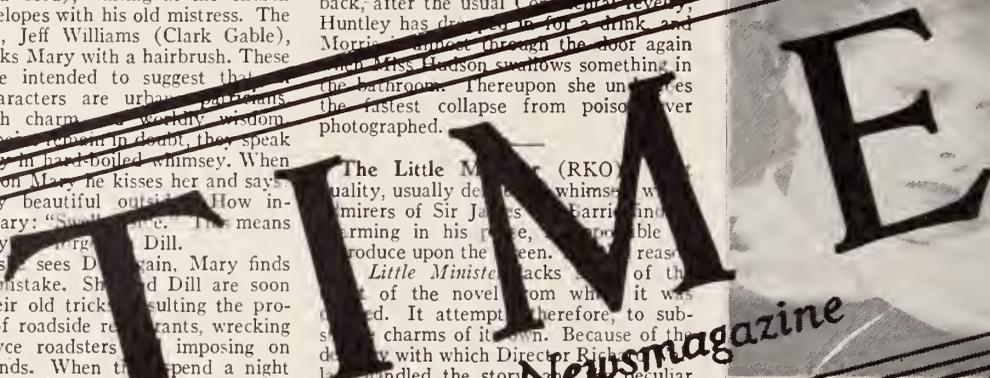
The story of *The Little Minister* concerns the Scottish village of Thrums and the alarm which awakes its devout residents when they learn that Mr. Dishart (John Beal), the rector at Auld Licht, has fallen in love with a gypsy. The panic in the parish is only exceeded by that of Mr. Dishart himself who, when he becomes aware of the state of his feelings, decides that the gypsy is a wanton. Actually, as the audience knows, Babbie is not a prowling vagrant at all, but the ward of Lord Rintoul, who lives in a castle at the top of the hill. Her habit of skulking through the woods in a dimity throu indicates not kleptomania but her desire to help the Thrums weavers in their dealings with the soldiers whom Lord Rintoul has imported to put a stop to difficulties at the mill.

If the adaptors of *The Little Minister* had modernized *The Little Minister*, they could have been accused of dodging all the honest implications of their theme in order to effect a sentimental happy ending. As a period piece, its unlikely personnel, its carefully sustained atmosphere and even its climax, reached when the hero's mother shows the village elders a lock of his baby hair, are in order. Lacking the tidal-wave sentimentality which made *Little Women* such an astounding hit a year ago (TIME, Nov. 27, 1933), *The Little Minister* should nonetheless seem pleasant to the public, admirable to the Legion of Decency and a masterpiece to Katharine Hepburn's devotees. Good shot: Wearyworld (Andy Clyde), the lonely village constable, trying to find someone to talk to as he makes his rounds.

Amateur Awards

In Hollywood last week, the American Society of Cinematographers awarded to two amateur cameramen the prizes which, for owners of miniature movie outfits, correspond to the awards which the Academy of Motion Picture Arts and Sciences give to cinema professionals. To R. B.

Clardy, a Los Angeles commercial artist, went \$250 for his 200-ft. film, *New Horizon*. A 20-year-old Japanese, Tatsuchi Okamoto, who won the photography award



KATHARINE HEPBURN

... puts a parish in a panic.

two years ago, last week took \$100 second prize with a picture called *Tender Friendship*.

Organized 17 years ago to provide a medium for distributing and testing new technical ideas, the A. S. C. has become the No. 1 technical club of Hollywood's cameramen. Its 400 members, including almost every important cameraman in the industry, rarely meet but contribute enthusiastically to the society's annual contests. The contests are governed by only two rules: 1) contestants must not have professional assistance; 2) they must not use 35 millimetre film and reduce it to the 8 or 16 millimetre sizes to which the contest is limited. Since it is impossible to detect reduced film, each entry is accompanied by a sworn statement that no such process has been used.

In *New Horizon*, Cinematographer Clardy presented the life of a farm girl at a moment of crisis. One reel, almost without titles, tells the story of her efforts to marry the man she loves in spite of her father's opposition which keeps her chained to the farm. Okamoto's heroine was a Japanese girl making a doll as a birthday present for a friend. Pictorial values, backgrounds of the Japanese countryside in spring, and the delicate grain which Cinematographer Okamoto had achieved gave his film distinction. Both winners last week used 8 mm. film. Clardy's camera was an Eastman No. 60 with an f-1.9 lens. Okamoto used the cheapest Ciné Kodak Eight made, model No. 20, which cost \$34.50.

Critics' Best

The ten best pictures of 1934, as selected by 424 critics through *Film Daily*, were: *Mr. Deeds Goes to Town*; *These Are the Days of Our Lives*; *The Sign of the Cross*; *One Night of Love*; *Little Women*; *The Thin Man*; *Mr. Smith Goes to Washington*; *Count of Monte Cristo*; *Berkley Square*.

REPRINT

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Amateur
Movie Contest *now*
BIG NEWS!

TIME
The Weekly Newsmagazine

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TIME handles only big news in its columns.

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TIME points the way. Keep in step with the *MARCH OF TIME . . .* with the *MARCH OF CINEMATOGRAPHIC* events through the columns of the *AMERICAN CINEMATOGRAPHER*.

CONTINUITY FOR REVERSED MOTION

(Continued from Page 75)

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Scene 34. Long-shot, a yard with a fence or wall four or five feet high. Jack runs into the picture, and bounds easily to the top of the wall, and down the other side. Butch and the boys come in, try to climb over the wall, but cannot. They continue on around, crowding through a narrow gate.

Scene 35. Long-shot of a barnyard; in the background is a barn, with a loft-door about five feet from the ground, also doors at ground level. Jack runs in from the right, makes a running jump up to the loft, and sits down to wait. Soon the others appear; they see Jack, and rush into the barn. As the last one disappears, Jack jumps down, and runs out at the left, just as Butch appears in the loft-door.

Scene 36. Long-shot. A country road with a bridge in the foreground. Jack, with his pursuers close behind him, runs down the road toward the lens.

Scene 37. Long-shot of the bridge, from the side. Jack runs into the picture from the right, and jumps from the bridge into the water. The others stop, and scramble down the bank. When they are all down on the riverbank, Jack jumps straight up from the water to the bridge, and runs off to the left.

Scene 38. Long-shot of an airplane in the air.

Scene 39. Long-shot of a field, Jack, followed by Butch & Co., runs in from the right, stops, and looks up.

Scene 40. Same as Scene 38; a short flash.

Scene 41. Same as Scene 39; Jack sprints forward, as though chasing the airplane.

Scene 42. Closer shot; Jack enters, and jumps right out of the top of the picture.

Scene 43. Close medium-shot, in the airplane. Jack shoots up from the bottom of the picture, and lands in the cockpit.

Scene 44. Butch and the others stop, looking up, and shaking their fists at Jack.

Scene 45. Close-up of Jack, in the airplane. He waves derisively at Butch, and speaks.

Title: "Now who's the best jumper?"

Scene 46. Close-up of Jack, as he finishes speaking. FADE OUT QUICKLY.

Scene 47. FADE IN QUICKLY. (Or a lap-dissolve, if possible). Close-shot of Jack—asleep in a chair. Clutched in his hand is a booklet, "HIGH JUMPING." FADE OUT.

THE END

Before you say, "Impossible!," see how your camera can make Jack do

these incredible jumps! It is easy enough for anyone to jump down from the fence, the loft, or the bridge; and if you film Jack jumping down, with your camera wrong side up, and reverse the scene when you edit the film, he will apparently be jumping up. Simple, isn't it? In Scene 34, for instance, you begin by putting Jack on top of the wall, marking his position with a piece of chalk. Then—with the camera upside-down—have him jump backward and down from the wall, then run off—still moving backwards. If you have a tripod, an angle-iron clamp will enable you to use the camera from the same general position whether it is upside-down or right side up; so all you will need to do to show Jack jumping down on the other side of the wall will be to turn the camera over, and have him jump from the position you have already marked. Otherwise you can divide the shot into two separate scenes. The same general method, of course, will give you Jack's leap up to the barn-loft. In the same way, the upside-down camera will enable you to show Jack jumping from the water up to the bridge. His jump into the water, of course is filmed normally; then, with the camera reversed, have him walk in backward from the left side, and jump backward into the water: the reversed film will show him at first in the water, then suddenly shooting up to the bridge, and walking off.

The airplane-jump is a bit harder. For the best effect, make this shot (Scene 42) under a horizontal bar, such as you can find in many playgrounds. Have this as high as Jack can jump, and, of course, out of the picture at the top. Jack enters and jumps, catches the bar, and pulls himself quickly out of the picture. A simpler method would be to use a low camera set-up, and have Jack run straight into the picture and jump over the camera. (A wide-angle lens will help this.) For Scene 43, all you need is an open-cockpit airplane on the ground. If the camera is in a fairly low position, shooting upward, you can have only sky for a background; and by tilting the camera sideways, you can give the impression that the plane is in level flying position. Of course, the camera is upside-down: begin your scene with Jack sitting in the cockpit, then have him stand, turn around, and jump straight down (backward, of course) from the cockpit. By quick cutting, you will be able to get a surprisingly effective jump; it will help, too, if the plane you choose is a fairly high one, like a "Fledgeling" or an old DeHavilland, so that Jack's backward jump will carry him pretty well out of the picture at the bottom.

Naturally, the higher these jumps are, the more astonished your audiences will

CINÉ-KODAK EIGHT

Wins highest awards in the 1934 Amateur Movie Contest of The American Society of Cinematographers

8mm Pictures Take Honors in 1934 Competition

AGAIN the lowly 8mm picture receives the plaudits and prizes most coveted in the 1934 AMERICAN CINEMATOGRAPHER Amateur Movie Contest. Last year one 8mm picture was among the winners; this year there are two, both of them definitely standing out above all other entries.

Many of the pictures entered were evidently produced as a definite subject for this contest. This meant that there were a great number of worthy productions to be considered by the judges.

Again, practically every civilized country on the globe was represented, and again some of the prizes will go abroad and into Canada.

In the final summing up all possible classes are not represented among the listed winners. This was for one of two reasons: either there were no entries in that class or the quality of the entries in that class did not warrant the honor a prize given by the American Cinematographer represents under its method of judging.

It will be remembered that last year it was established that a picture must average of at least 85% in order to be considered a prize winner. Based on this rating the final summing up brought forth prizes for eight classifications and an additional prize for photography. Those classifications represented are Home Movie, Scenic, Documentary, Kodacolor, Educational, Scientific, Travel, and Scenarios.

The \$250.00 prize for the best all around picture went to R. B. Clardy of Los Angeles for his 8mm picture "New Horizon," made in 200 feet. Clardy was the winner last year of the gold medal for scenario and photography. Last year Clardy's picture was based on a western theme, while this year his scenario, although set in its greater part in the outdoors had several indoor shots. However, most to be admired was the way in which he handled his production both from composition and directorial standpoint. There were only three people in his cast with the girl assuming the major role. His sense of dramatic values, and especially his fine feeling for the proper tempo brought forth unstinted praise from the judges. His photography rated high for 8mm film, but was not quite up to the very fine photography of Tatsuchi Okamoto of Japan. Okamoto two years ago won the prize for photography with his 16mm picture "Early Summer." Since then he has turned to the 8mm camera. His picture "Tender Friendship," in 150 feet of 8mm film, was sensational from the photographic standpoint. Its sheer beauty, its poetic rhythm both in story and photography, made it one of the outstanding pictures of the contest.

December 1934 • American Cinematographer 365

WINNERS

- GRAND PRIZE, \$250.00** . . . R. B. Clardy, Los Angeles, Calif., for "New Horizon," 8mm, 1 reel.
- PHOTOGRAPHY, \$100.00** . . . Tatsuchi Okamoto, Matsuyama, Japan, for "Tender Friendship," 8mm, 1 reel.
- HOME MOVIE, \$50.00** . . . Van Dee Sickler, Los Angeles, for "Mischievous," 16mm, 1 reel.
- SCENIC, \$50.00** . . . J. Sherlock, Sydney, Australia, for "The Brook," 16mm, 1 reel.
- DOCUMENTARY, \$50.00** . . . Leslie P. Thatcher, Toronto, Canada, for "Another Day," 16mm, 1 reel.
- KODACOLOR, \$50.00** . . . Miss Roanna W. Hill, Pittsburgh, Pa., for "October," 16mm, 1 reel.
- EDUCATIONAL, \$50.00** . . . H. Demorest, Hackensack, N. J., for "The Story of Water," 16mm, 1 reel.
- SCIENTIFIC, \$50.00** . . . M. Abraham Shur, Bronx, N. Y., for "Reconstruction of Nose," 16mm, 1 reel.
- TRAVEL, \$50.00** . . . John E. Earl, Los Angeles, Calif., for "The Traveler," 16mm, 1 reel.
- SCENARIO, \$50.00** . . . R. B. Clardy, Los Angeles, Calif., for "New Horizon," 8mm, 1 reel.

While Okamoto would qualify for the photographic prize only, still the judges felt that his picture was deserving of more consideration and raised that prize from \$50.00 to \$100.00 in recognition of his unusually fine photography.

"New Horizon" by Clardy and "Tender Friendship" by Okamoto, both made an 8mm film, were unanimously by the two outstanding pictures in the contest by the judges. As is known, the judges in this contest are members of the American Society of Cinematographers, the ace cameramen of Hollywood's studios. Many of them are users of 16mm and 8mm cameras. They are familiar with the problems that confront the amateur with the equipment available to them, and are appreciative of the results obtained by the amateur because of their own experience in the professional field.

This does not mean that the work and photography of Clardy and Okamoto drew forth such high praise and show the same technical excellence.

The grand prize for the best all round picture was won by Mr. R. B. Clardy with a Ciné-Kodak Eight, Model 60.

The first prize for finest photography was won by Mr. Tatsuchi Okamoto with a Ciné-Kodak Eight, Model 20.

. . . and, according to a wire from the American Cinematographer, every one of the prize winners used Ciné-Kodak Film.

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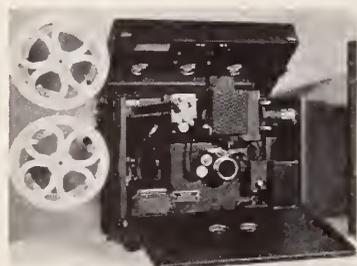
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be, so don't feel yourself bound by the heights specified in the scenario. If the boy who plays Jack in your production can't safely make the four or five-foot backward jump down, make them smaller; but if your young actor is larger, and can make higher jump-downs, by all means have them as high as he can safely manage. Also, if your particular neighborhood offers other interesting

opportunities for this trick, make use of them, and add them to the story, filming them the same way. The best use of these "backyard movies" is always made by adapting them to your own, individual requirements: you can always add characters, or eliminate them, and add such scenes as you feel would make the picture more interesting with your family "stock company."

SYNCHRONIZING SOUND CARTOONS

(Continued from Page 76)

he has 200 frames, or 100 drawings, for that scene, while the Musical Director knows that he must allow ten bars for the scene.

If a definite musical effect—say a whistle or a bugle-call—comes in the scene, its exact place is indicated by the statement that it starts in such-and-such a bar. Let's say that "Oswald" is to blow a bugle-call in the middle of the scene: it must start in bar No. 5 of the music, and in frame No. 101 of the film, and in drawing No. 51. In the same way, it is noted at what bar that particular sound ceases, so the animator knows exactly when to make the drawings of "Oswald" taking the bugle from his lips begin.

In a dance, or a strongly rhythmic walk or run, we have to be sure that the feet of the characters are on the floor at the start of each bar. This keeps them definitely in step with the rhythm of the music. And it is easy for the animator: he knows that new bars will start at drawings 1, 11, 21, and so on, so he spaces his intermediate drawings to ensure that the feet will be in the right positions at these key drawings.

When the scenario is completed, the Musical Director writes his final score, making sure that each bar (they are all numbered, by the way), fits into its proper place in the scenario.

At the same time, the animators get busy turning out their drawings, making sure that the key drawings contain exactly the action needed to synchronize with their accompanying music.

Now, the music is recorded. As a rule, our cartoons consist of three definite musical movements: the slow, 32-Tempo start, the faster 24-Tempo middle, and the brisk 20-Tempo finish. These three parts are usually recorded separately; sometimes, the sections themselves are even broken down into shorter units, which are recorded piecemeal. Naturally, they must be recorded with the greatest attention to accurate rhythm and tempo: so we have worked out a special system for giving the right beat to the orchestra. We have animated several strips of film, showing a baton moving very accurately to each of

the three principal tempos we use, and in varying rhythms—march, waltz, etc. When the orchestra is ready to record, the proper cue-film is put in the projector in the scoring-stage: usually, we use a simple loop of film, rather than a reel. This is projected on a screen, and gives the conductor his beat. He, in turn, follows it with his baton, and gives it to the musicians, who follow him, rather than the screen. In this manner, we are assured that the tempo of our music will be unvaryingly accurate.

Since the music is usually recorded in three or more sections, the arrangers provide at the end of each section an appropriate musical transition from one rhythm to the other, often changing key in the process, and providing a music-track that is easily cut when the sections are all recorded and ready to be joined.

As a rule, the music track is completed considerably before the picture is photographed. Sometimes the music has been completely recorded even before the drawings were made!

Sound-effects are recorded on a separate track from the music, as is dialog. These—especially the latter—are always recorded before the drawings are made. Then, the sound-track footage is carefully translated into terms of drawings, so that the animator can draw the proper lip-movements and so on in exactly the right manner. Speech is broken down into its component vowels: for example, suppose someone was to say the word "Vacation." This contains three definite vowels, of different lengths: "Va-ca-tion," and would require three definite lip-movements. I would record this, and then find out at exactly what point each of the vowel-sounds started. This will show the animator at what frame each vowel-motion must come, and, in turn, at what drawing he should provide the necessary lip-movements.

When the drawings are completed, they are photographed in their proper order, allowing each its requisite number of frames. The man at the camera has a copy of the scenario, and with it a special instruction-sheet giving him

special information if any is necessary. It is his duty to check up on the drawings, and make sure that they are in exact accord with the bar, drawing and frame specifications in the scenario.

Now, we have four sets of film which must be assembled into one to form our completed cartoon. On one strip is the action—photographs of the drawings. On the next, the music, with all of the sub-sections joined into one continuous track. Thirdly, we have short sections of sound-track carrying the dialog, and lastly, similar short lengths carrying the sound-effects. The last three, of course, are on 17.5mm film, as we use the split-film recording methods. On the blank part of the music-track, we have already marked the main synchronizing frame or drawing numbers.

Synchronizing the music-track and the picture is simple. If both have been made right, they should be "in synk" immediately. If a test on a Moviola, or in a twin-film projector shows any error, it is generally simple to correct it by trimming a frame or two out of picture or music, as may be preferable. Generally, it is easier to trim the picture, for there are plenty of chances to nip out a frame or two—the error seldom exceeds this—when one drawing is held for several frames. In the main, though, this phase of the cutting has been done already, in the earlier stages of making drawings and writing the score.

Synchronizing the sound-effects or dialog is a little harder. However, we know—to the frame—just where they are to go: so we simply put the picture on a multiple rewind, with the sound-effects track beside it. The short bits of effects-track are cut in at their proper points, and joined together with blank film.

After that, it is simply a matter of routine "dubbing." The dialog-and-effects track are re-recorded with the music-track to form a single, complete sound-track. If this proves O.K. on projection, we are ready to make our composite Master Print; and from then on, turning out perfectly-synchronizing re-release-prints is ordinary laboratory routine.

So, by treating sound and drawings together from the start—planning on accurate synchronization in the scenario itself, and cross-checking for synchronism through every stage of production, we can be certain that once sound and picture are actually on film, they will fall together like perfect pieces of machinery. Looking after the details of synchronizing before there is anything to actually synchronize, we find that synchronizing presents no problem in the cutting-room.

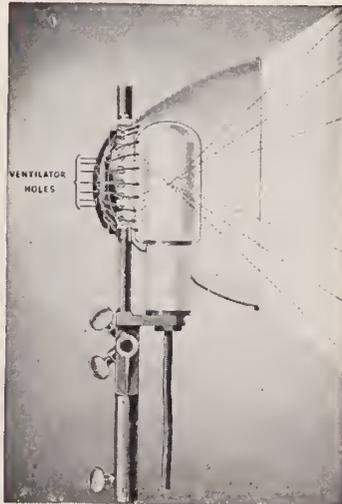
The Leica Comes of Age

(Continued from Page 73)

important things at stake. However, after the War, Barnack again devoted much time to his hobby. From the continued use of his original Leica, he perceived that his camera possessed great photographic and commercial possibilities and that it really represented a distinct advancement in camera design. However, he realized that the camera that he held in his hand was far from perfect, so he set about building a new camera; adding improvements that had been forming in his mind for some time. Such things as film magazines and a new shutter of the focal-plane type, that had variable-width openings and one that also obviated the necessity of covering the lens when winding the shutter. Along with these improvements, the first high-quality anastigmat lenses designed by Dr. Berek of the Leitz Works, made their appearance and soon things were progressing rapidly.

In 1924, the first battery of six Leica cameras left the factory. However, the year of 1925 was the first real Leica year, for at that time the Leica was introduced to the various dealer's associations thruout Germany. These dealers readily saw the possibilities of this new camera, which was destined to revolutionize photographic conceptions, and consequently in firm belief of success, placed their sales vigor behind the Leica. Thus, these dealers played a very important part in the introduction of the Leica and thereby increased the demands for this camera. Of the original Model "A" Leica, 53,000 were sold. Model "B," which was similar to Model "A" with the exception that it had a Compur shutter, had 2,000 sales.

While the world was accepting Oskar



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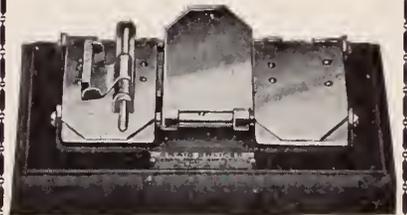
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Barnack's camera in a most unprecedented manner, Barnack was still hard at work devising and perfecting new accessories for the camera. One of the most important was the Filoy enlarging apparatus, which was introduced in 1926.

It is worthwhile here to notice, that in all of the later model Leicas that were to come, they were all to be basically the same as the original model. Thus the earliest Model "A" is readily convertible into the latest Model "F." In 1931 the Model "C," with interchangeable lenses, was placed upon the market. Of this model and the somewhat similar Model "E" that replaced it, 24,000 cameras have been sold. The Models "D" and "F" with built-in range-finders made their appearances in 1932 and 1933, respectively. To date, 71,000 of these cameras have been manufactured. Thus the over 150,000 Leica cameras that are now in use represent the triumph of an idea in a span of time of barely ten years of sales.

While the Leitz Works hesitate to disclose all of the outstanding and important innovations that will most likely be offered during 1935, these following items may be expected in the near future: An f:4.5 Tele-lens of 200mm focus; a soft portrait lens; an f:2.2 lens of 90mm focus; and an optical near distance focusing device which permits the Leica to be used at close range without the interposition of front lenses and which can be utilized for adjustment at such distances, by means of a distance meter.

In the offices of The American Society of Cinematographers, beside the pictures of Thomas Edison and George Eastman, there hangs an autographed self-portrait of Oskar Barnack, that was made with one of his cameras. The technical excellence of this portrait is so strikingly noticeable, that one cannot help but feel, as he gazes at this portrait of this sincere and intelligent man, that Oskar Barnack's Leica has come of age!

Miniature Shots for Your Home Movies

(Continued from Page 68)

of excellent kits available for building real scale-model boats and planes; and if you aren't enough of a model-craftsman to tackle the job of making them (though they are simple enough to assemble), you will probably find a neighbor or a neighbor's son who already follows the hobby. Very few of the scale-model boats are self-propelling, so the best thing to do is to tow them with wires placed below the water-line.

The model planes are divided into two main classes: the scale-models, which are often marvellously accurate reproductions of real planes; and flying-models, which, while not so accurately proportioned, fly under their own power—which the others do not. If you can work out-of-doors, where you have lots of light, and can shoot slow-motion, the flying models will often do quite well. But for the best results, the scale-models are the thing. In making your scenes, you can follow the professional practice of suspending them on fine, invisible wires, inclined, if you are trying to film landings or take-offs. If you are using lights, keep a close watch on these wires, lest they glisten and show up in the picture: when you catch a gleam, rub it out with a bit of putty.

The propellers of model planes can often be troublesome: those of the flying models have to be much larger than natural, while those of the non-flying, scale models don't usually move. Professionals often remove the "props" entirely, and substitute discs of transparent celluloid which give an excellent suggestion of the blur of a rapidly whirling metal propeller. Try it! The

disc must, of course, be cut to the right size, and mounted behind the regular "spinner," or streamlined hub-cap.

In general, whether you are shooting miniature trains, boats, or airplanes, you'll get the most convincing results if you use models that are accurate as to scale and design, rather than just any toys you may have handy. You'll find that the smoothest, most natural-looking shots are those made at slow-motion speeds—32 at least, and preferably 48 or 64. If you can use a very slight degree of diffusion—about a 1/32 or 1/64 diffusion filter—it will help, too, as the faint diffusion will smooth off the sharp edges, and make the miniature seem more natural. Generally speaking, too, a 1-inch lens, wide open, will prove better than a wide-angle objective, as the rather lessened depth of focus adds naturalness in closer shots, giving a better perspective. If you can, it is well to follow the example of the professional miniature-experts, lighting the background (if any!) quite flat, and the miniature itself with a good deal of contrast.

Above all, don't jump to the conclusion that you'll need a lot of detailed scenery and the like for such miniatures. Some professional miniatures are, of course, marvels of painstaking detail; but many of the best of them are so simple that unless you looked through the camera, you wouldn't believe that the shot could be at all effective on the screen. Shooting primarily for night-effects, you can concentrate largely on the foreground, letting the "distance"

go dark. A neutral-tinted, unpatterned rug will often double excellently for grass, twigs for trees, flour, rock-salt, and even cotton-wool, for snow: and if you compose and light your picture properly, you can concentrate attention

upon the moving miniature, with the result that little else will be noticed.

And—when miniature shots in themselves pall—try some double-exposure work, matting living people into the miniatures. It can be done!

MUSIC FOR YOUR MOVIES

(Continued from Page 74)

passengers, the engineer at his throttle, the fireman feeding coal into the engine's glowing maw, and finally both picture and accompaniment decelerate as the train glides into the terminal at the end of the run.

I am sure that Imaizumi began with simply an idea that he could make an interesting picture about a train. Then he found the record. (It is "Galop de Chemin de Fer," a Polydor record, if you are interested.) It began with the guard's two whistle-blasts: obviously, that gave a cue for the opening scenes of his picture. Next came the logical sounds suggesting the train starting. The body of the piece was well adapted to rhythmic cutting, for changes in tempo, key and instrumentation naturally suggested corresponding changes in the pictured scene. Phrases played at a lower, but increasing volume naturally suggested shots showing the train emerging from a tunnel; phrases played more staccato, and recorded at a higher volume-level similarly suggested the shots made in the engine; and the end of the record, coming to a swiftly decelerating climax, just as inevitably suggested the treatment for the end of the film.

Anyone with an appreciation of musical and filmic rhythms will find it not only easy, but extremely interesting to fashion his films to fit recorded music in this manner. The subject-matter is almost unlimited in scope, ranging from the simplest scenics to the most pretentious productions. One last word of caution, however: while the simplest method of projection is the projector-and-phonograph method I've described, I have no doubt that some of you are already wondering why it wouldn't be simpler still to use one of the synchronous disc-type talkie outfits commercially available, like the Filmophone and the Animatophone. Aside from the matter of cost, which bothers most of us, such machines would be preferable except for one detail—most commercial gramophone records are made to play at 78 r.p.m., while the majority of disc talkie machines will only play the professional-type discs, which run at 33 r.p.m. This will automatically limit you to the "long-playing" records, which offer only a lim-

ited selection as yet. So, if you try this idea out, and like it enough to want a synchronous projector, make sure before you buy that the machine will accommodate standard 78 r.p.m. records.

Let's Talk About Lenses

(Continued from Page 71)

the same way, a shallow room may be made to appear deeper by using a wide-angle lens.

It appears, then, that we must at all times bear in mind distortion in perspective, and either frankly admit its faults in those shots not possible otherwise, or deliberately take advantage of the effect. You must admit, however, that there can be and often is distortion, no matter how perfectly corrected your lens. Don't let it prove a bugaboo—just bridle it and make it work to your advantage.

And now, in closing this series on the lens, may I humbly hope that our discussions have proven worthwhile in bringing a little closer to our cine work knowledge bearing directly on the possibilities of improvement. Admittedly, I am no authority on the lens, my only excuse for having bored you for five months being to try to digest a lot of deeply technical information and reword it in laymen's lexicon. The written word must be accepted with a bit of reflection, for it must necessarily be somewhat brief and because it has not the amplification of conversational intonation. Therefore, when you read something not quite jibing with your own thoughts, try to reword it or translate it into your own manner of thinking.

Correction

On page 366 of the December 1934 issue we stated the Goertz Dagor was faster than the Zeiss Protar. The f value of the Zeiss Protar, composed of two similar components, is $f:6.3$; that of the Dagor is $f:6.8$, which from the standpoint of f value makes the Protar the faster lens. The loss by reflection is the same in both lenses because each has four air-glass surfaces. Loss at the interfaces between different kinds of glass is insignificant. The loss due to absorption depends on the thickness of the glass and not on how many pieces of glass there are.

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PRACTICAL AMATEUR PHOTOGRAPHY

Little, Brawn & Company have just published a book entitled "Practical Amateur Photography," authored by William S. Davis. The book contains 264 pages and sells for \$2.25.

The greater part of this book is given to still photography. One chapter is devoted to Amateur Cinematography. The book is basic in its contents and is aimed entirely at the beginner. It deals to a great extent in equipment and materials available and their characteristics.

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The Motion Picture CAMERA Magazine

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of motion picture photography.

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Next Month

- Something about makeup, especially as it relates to the cinematographer and the relation between the cinematographer and the makeup man, how they can cooperate to secure better results.
- James L. Fritz will interview one or two more of our famous ace cinematographers. He will give you the critic's slant of the man behind the camera.
- We are promised an article telling us how the pictures of the Hauptmann trial were secured without the traaper who stood alongside of the camera knowing it was running. It sounds interesting.



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THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science. Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship. To this end its membership is composed of the outstanding cinematographers of the world with Associate and Honorary memberships bestowed upon those who, though not active cinematographers, are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science. To further these lofty aims and to fittingly chronicle the progress of cinematography, the Society's publication, The American Cinematographer, is dedicated.

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High Intensity Mercury Vapor Lamp for Photographic Applications

by

R. E. Farnham

With General Electric Co.

THE announcement of the new high intensity mercury vapor lamp was soon followed by a considerable number of inquiries as to its merit for the various phases of photographic work. These are based on the more or less general knowledge that practically all photo-sensitive materials function more readily in the blue-violet part of the spectrum and that therefore an illuminant having a large part of its energy output in this region may have many important applications. It is, of course, obvious that there is no point in applying the mercury vapor lamp for the various photographic applications unless it can show some definite advantage. This can be a reduction in the wattage necessary to do a particular job, or, what is more important, shorter exposures with the same wattage which means greater economy or greater production. Accordingly, the Nela Park Engineering Department has made a preliminary investigation of the new source with the various requirements of the photographic field in mind.

The high intensity mercury vapor lamp is available at the present time in the 400-watt (14000-lumens) size only. (Actually, with its regulator, each unit draws 420 to 475 watts.) Its three competitors are (1) the white flame and solid carbon arcs, (2) the older type mercury vapor tube, and (3) the MAZDA lamp, particularly the photoflood type.

The arcs consume from 1200 to 4500 watts (line) which means that from three to ten mercury lamps complete with control equipments would be necessary to replace a single arc lamp on a comparable wattage basis. Similarly, the No. 4 Photoflood (1000-watts, 33000-lumens) and the Movieflood (2000-watts, 66000-lumens) would require the employment of 2 to 3 and 5 mercury outfits respectively to replace a single MAZDA lamp, with the result that the mercury vapor lamp starts with somewhat of a handicap, being in such relatively small wattage

Color	Wave Length (Angstroms)	Per cent*
Ultra-violet	3654	2.7
Violet	4047	8.1
	4358	20.3
Blue	4950	.9
Green	5461	29.7
Yellow	5780	20.0
Orange	6234	1.4
Red	6716	2.1
	7130	2.6
Infra Red	7660	3.2

*Data by Dr. Barnes—Lamp Dev. Lab.

units. The introduction of the mercury vapor lamp to many of the photographic applications would be greatly facilitated were the lamp available in larger units.

The spectrum of the high intensity mercury lamp is of the discontinuous type; that is, the light is given off only at certain wave lengths and is totally missing at others. This is quite different from that of the MAZDA lamp which is continuous through all visible wave lengths. The spectral energy distribution of the high intensity mercury lamp as it is now being supplied is shown by the above table.

It is the energy in the near-ultra-violet, violet and blue regions of the spectrum, amounting to about 32% of the total radiation in the visible or near-visible spectrum that is of greatest interest in connection with the use of this lamp with photo-sensitive materials. In this same range, namely, 3654 to 5000 Angstroms the Photoflood Lamps emit approximately 22% of their energy. Thus, from the light quality standpoint the mercury vapor lamp should be considerably over 50% more effective than the Photofloods for the same wattage, especially with those materials which show rapidly increasing sensitivity towards the extreme violet.

There are three characteristics of this lamp, different from other sources which must be considered in its practical application in photographic work. (1) Limited burning position; i.e., the lamp must be operated vertically, base up. (2) The lamp requires approximately 15 minutes "warming up" before reaching full brilliancy and if it is turned off even for an instant it will not relight until it has cooled to practically room temperature. (3) Its operation is limited to alternating current circuits.

The following paragraphs briefly discuss the application of the high intensity mercury vapor source to still photography.

Commercial Photography

Under this subhead comes the photography of a larger variety of objects, and in many instances, the ability to differentiate colors is most important. Panchromatic film is universally employed. The mercury lamp would hardly be applicable both from its deficiency of some colors and its slow starting. Photographers usually like to get set up, make their picture, and develop the negative in as short a time as possible, then sometimes go back and make another negative if the first is not satisfactory. The slow start as well as the inability to relight the lamp immediately, might prove a handicap for many photographers without compensating advantages.

(Continued on Page 106)



George Folsey at extreme left directing photography in the M.G.M. production "Reckless" starring Jean Harlow.

Artistic Honesty in Cinematography

by
George J. Folsey, A.S.C.

BEFORE a person can express a thing convincingly, he must be convinced of it himself. He must understand it: he must have had in his own past experience something in some measure comparable to that which he wishes to express. In all lines of artistic endeavor, this fact is recognized. Even in our own industry, writers, directors and actors agree that the most convincing effects are those based to some extent upon the personal experience of the individual artist.

To my mind, this is the keynote of truly successful Cinematography. It may be argued, of course, that the Cinematographer's task is more mechanical than artistic: a merely photographic reproduction of what others place before his lens. To a certain extent, of course, this is true; but in actual practice there is far too much variation in the manner in which different Cinematographers would present the same scene to permit us to ignore the fact that despite all commercial considerations and the collectivized nature of film-production, individual expression plays a vital part in camerawork.

Therefore, even though others as well, or even better qualified to speak, may hold contrary opinions, I am certain that our work can be entirely convincing only when we base it upon personal experience—memories of things comparable with the scenes we are seeking to put upon the screen. To illustrate this more clearly: in a picture I once photographed there was a sequence laid in a theatre-manager's office, back-stage in a great playhouse. At the rear of the set was a large window through which could be seen the stage, upon which was taking place a rehearsal for a revue. The effect should have been strikingly unusual—but it wasn't. I have been in many a theatre-manager's office, but nowhere in my past experience could I call upon anything even approximating this particular setting. As a result, I was unable to convince myself of the reality of that scene—and accordingly, it was not convincing on the screen, though we spent days making and re-making it.

I know that I exerted all possible care in lighting and photographing that scene. I used the same methods that I would use for any other shot, and I am morally certain that the calculations and technique of the special-process experts who put in the backstage background were mathematically correct. None the less, the scene did not ring true on the screen. The only reason I can find to account for this failure is that the scene was not right to begin

(Continued on Page 104)

The Camera's Omniscient Eye

by
A. Lindsley Lane, A.S.C.

WHETHER a sequence, in its conception and execution, is to be shot in scenes all from a normal stage-audience viewpoint; or, the majority of scenes shot abjectively, with a few dynamic punches from subjective angles; or only a few orienting shots made normally, and the greater part of the sequence made from interpretive set-ups; or in any other manner, is a question of specific technique the director and cinematographer together must decide, their method dependent on the relative normality or extraordinary quality of the sequence in question. That is, the interrelated cinematic factors of: literary content, action, tempo, mood, characters and settings, and audience reaction, must all be considered to ascertain the optimum point for the camera lens (and also its focal-length) at any given moment. Furthermore, as a complementary phase of this creative work, there is always the omniscience of the camera eye to reckon with—that unique illusion of "all-seeingness" which places the motion picture apart from every other form of artistic expression.

"All-seeingness" here means that the camera stimulates, through correct choice of subject-matter and set-up, the sense within the percipient of "being at the most vital part of the experience—at the most advantageous point of perception" throughout the picture.

The omniscience of the camera eye is a function and an ideal which is felt subconsciously by the percipient, rather than understood by him; and picturegoers more or less resent abuse or loss of that function. From this may be inferred why many mystery pictures have been unsatisfactory; the observer sensing the camera might easily have discovered what is withheld too arbitrarily, feels an antagonism toward the picture. At best, the impression carried away from the theatre by the audience is "much ado about little." It is this frustration of the camera's omniscience (instead of the use of that function to complicate) which brings the picturegoer to a semi-awareness of poor storytelling.

The principle can be stated another way. The percipient of an excellently constructed photoplay automatically merges his identity or self with the picture stimuli. On the other hand, in a badly made picture, he fails to realize his identity with the picture and remains simply an unsympathetic, critical observer looking on from the outside.

"Saying the one right thing at the one right time" (omniscient perception) would seem to be the basic law of the motion picture. And within this law persists the greatest reason for key-workers cooperating in extended planning and minute preparations before shooting.

One of the finest examples to date of sustained and unitary camera omniscience is to be found in "Crime Without Passion." In harmony with this achievement of the camera's fluent participating in dramatic intent, there is a tenacious rhythm of cumulative suspense and inevitable consummation. The observer of this picture truly becomes its percipient, because of an unusually close integration of creative artistry and technical skill molding into one the picture's material, form and subject-matter. And its percipients have conclusive proof of their "experience" in the echoes which roll back over them far days after seeing this picture. In fact, many will discover this particular picture-experience so "strongly new" as to tell others of the "distinctly different picture." And this, not because of, but in spite of the almost total lack of conventional "heart interest" in the story. Incidentally, it is interesting to note that Lee Garmes, one of the industry's leading cinematographers was, in the making of "Crime Without Passion," not only Director of Photography, but also closely cooperating with the Author-Director-Producers as Associate Director.

For the reason that genuine art conceals its own formulation, it may be said that a motion picture which in its showing gives self-evidence of its making is not a good picture artistically and holds the chemistry of dissolution within its own structure, drawing the audience's attention away from its story-experience purpose; is, in other words, destructive to intactness of the "illusion of occurrence," which illusion is the psychological key to a successful motion picture-percipient experience.

Omniscient perception actually achieved in the motion picture results in the percipient having no least feeling or consciousness of the camera's interpretive instrumentality. The cinematographer's work and the use of his tools are self-effaced from the final effect.

Generally speaking, cinematographic effects have in the past been over-stressed rather than repressed. The confusing use of subjective or grotesque angles, stark lighting and over-correcting spectrum filters, the restless mobile

(Continued on Page 102)





Ernest
Haller,
A.S.C.

Haller Places Stress on Detail

by

James L. Fritz

Formerly dramatic editor of St. Louis Post Dispatch
and New York Daily Mirror.

AFTER seeing any one of Ernie Haller's cinematographic products, one can readily realize why this young man is sometimes called the "King of "Detail."

Haller has regulated his life so that every hour of the day is spent in a detailed and beneficial manner. Naturally if his life is governed in this way you would expect the same quality in his pictures. This quality makes itself vitally manifest in his latest Warner Bros. production, "Wonderlust." When viewing this picture one even feels that perhaps some of the artistic quality of the production might have been sacrificed in the endeavor to bring out every underlying movement of the story.

Haller will tell you that once a script is given to him, he will treat it as if it were a text book. It does not receive a mere reading, but he gives it a thorough fine-

combing and minute study. This is done so that when he begins the actual work on the picture, the story will be so vividly stamped into his mind that every situation and location will be as familiar to him as his own face. This rigid task which he sets for himself before every picture, enables him to visualize even further than his finished product. He obtains the imaginary reaction of the audience for his work. And he further insists that the product which is turned out of his camera be a thing of pleasure and entertainment even if his audience be made up of critical cinematographers.

In this treatment of the story, he first considers the characters in the story. If they are Aline MacMahon and Guy Kibbee, who portray the principal roles in his most recent effort, he immediately makes a study of their characters from every possible standpoint that his lens will be required to register. Mentally he sets his lights in the various sequences. If the scene is to be a press room of a country newspaper he recalls, if possible, a visit he made at one time or another to this kind of a print shop. He definitely places, for instance, Guy Kibbee at the keyboard of a linotype machine or at the handle of an early-type flat-bed handpress. He sees him as he would look with his face covered with printer's ink. He knows long before his story commences, the amount of light that is going to be necessary to impress on his film the character that this actor is attempting to live.

Holler entered the motion picture business from a draftsman's board in an architect's office and it is this training which gives him an eye for perspective. But for a display of temper over a pecuniary matter he might still be putting on plans the ideas of architects. He had obtained some extra work for his employer and had been promised compensation for it. When it wasn't forthcoming he told his employer what he thought of him.

With his hat still in his hand he entered the employees' door of a motion picture laboratory and there began the training which has fitted him for the position he now holds among motion picture photographers.

It was while thus employed that the demand for detail was definitely impregnated. He had observed the careless manner that detail was being watched in the early days of cinematography and resolved that when his opportunity came along this would be of utmost importance.

The once cinematographer has some very definite ideas about make-up. Unfortunately they do not contribute much praise to the manufacturers of cosmetics. He feels that make-up has a definite place in motion pictures but that too much stress is laid on its importance. There is not very much being done with grease paint that cannot be done with lights.

This is not just a theory with him for he has proven it conclusively. He took a well known motion picture star after her make-up had been completed one morning and removed from one side of her face all of the point, eye-shadow, etc. His experiment received the hearty approval of the star to such an extent that when he photographed her next picture he did so with just ordinary street make-up.

When reading his script, Haller goes through exactly the same process that the assistant director does in breaking down a script. His script is as full of notations as a script-clerk's.

He consults the art director of his picture and learns exactly what he is going to be given in the way of sets. He finds out from the Property Head just what he is going

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Photography Should Interpret Personality and Character

by
Gaetano Gaudio, A. S. C.
As told to James L. Fritz



Gaetano Gaudio, A.S.C.

THE one outstanding quality of present day motion pictures, to my belief, is the ability on the part of the cinematographer to inject character and feeling into his art. This is the only quality that can be injected into a story through the art of the cinematographer. The other qualities, such as richness and beauty, cannot be injected into any motion picture, unless that quality is possessed by the story or script, the subjects themselves, and the settings and backgrounds with which they are surrounded.

It has always been my belief, that a cinematographer, if he wishes to become proficient in his art, must be a good actor, a good director, and have literary knowledge, so that he will be enabled to bring out the true characterization of the story which he is photographing.

When I am called to begin work on a picture, I first take the script and study it diligently. It is here that I get the first interpretation of the author's thought. I then place myself in each of the roles or parts. I do this so as to obtain the feel of the story. After I have inwardly enacted each part to myself, the characterization which will be portrayed by the subject becomes intimately familiar.

We all know that the film itself, and the convos upon which it is projected, are drab and lifeless things at best. Then how, knowing this, can we expect audiences to be entertained and amused, unless we, through lighting, shading, and the use of diffusion, build character in the subject? It has been pointed out at various times, that color treatment aids in bringing out character. Under the present color processes, this is not true, because the color treatments now used in motion pictures are mere optical illusions. Character can never be expressed through any falsity on the part of the cinematographer. By this, we mean creating an illusion of character, where such character originally does not exist. Therefore it is my belief that color for motion pictures shall never be a success until a process, similar to the Lumiere plate, has been perfected. Such a process would mean that the true and natural colors of the subject would come out of the camera, the same as they were photographed, without distortion or change, instead of the black and white print of today, which must be colored later by a laboratory process.

True characterization is only obtained in one way. The cinematographer must obtain the full feelings of the subject which he is photographing. By feeling, we do not mean the character that the subject is portraying, but he must also obtain the true character of the subject itself, so that he can capture on film, the natural personality and character of the subject. This adds another qualification to the cinematographer. It means that he must be an excellent judge of personalities.

In the last picture I filmed for Warner Brothers, "Go Into Your Dance," in which Al Jolson was the star, a difficult problem arose with which every cinematographer has had to cope at one time or another. Various cinematographers, on previous pictures, had been lighting Jolson's face in such a way as to erase the wrinkles and lines that are naturally his. The result, when this treatment is given to any subject, is that the face becomes a mask and it is difficult to obtain the emotion then being enacted by the subject. In this picture the process was reversed. The subject was lighted in such a way that these wrinkles, without being allowed to become harsh and destructive to the subject's appearance, were brought out enough to allow the subject to retain his true personality and character.

This means of portraying character is being used on the latest Warner Brothers production, "Oil for the Lamps of China." The characterization of the subjects in this particular motion picture are definite and forceful. It is therefore necessary that the cinematographer, if the audience is to gain the full benefit embodied in the story itself, should, at all times, strive to bring out forcefully the character in the faces of the subjects which he is photographing.

I carry character study even further into the fields of cinematographic research than merely the first study of the script and subject. Every scene which is photographed by the motion picture camera, during the course of the day, I also photograph with a Leica camera, which I have with me at all times. These still pictures are then taken home and developed. This enables me to give more time

(Continued on Page 102)



Reflectors made for an emergency from 1000-ft. film cans. At left Cavalieri; at right Beverly Jones, director.

IN ADDITION to food, camp equipment and other necessary supplies for seven men and four dogs, we had the added problem of a complete Bell and Howell studio outfit, an Akeley, and three Eyemos, not to mention a couple of hundred thousand feet of raw stock and numerous still cameras.

On our first trek out from our base camp at False Pass on Unimak Island in the Aleutians, our first serious film problem hit us. We needed 400-foot lengths of negative for the Bell and Howell, 200-foot lengths for the Akeley, and 100-foot lengths for the Eyemos. Our film had been put up in hermetically sealed containers holding five rolls and designed to withstand the beating they were bound to get in our pack sacks and the dog packs. At the start of our first trek, we found the big containers holding the 400-foot Bell and Howell rolls to be too bulky and too large for the dog packs. This called for our first technical huddle. We finally decided we could use our 200-foot rolls in both the Bell and Howell and Akeley magazines; furthermore they were convenient to carry as were the containers of the 100-foot rolls. Luckily we had sufficient negative stock in 200-foot rolls to last us for the season; had we ordered fifty percent of our negative stock to be made up into 400-foot lengths as we had planned previously, it would have caused us no end of trouble and would have been a serious handicap to the photographic success of the adventure. This transportation problem was one we, on the camera end, didn't give more than normal attention, yet on an expedition such as this one, it is as vital as knowing what lenses are necessary to have with you for successful camera work.

Not very long after our arrival at base camp in the Aleutians, we ran into another problem we had not anticipated. We needed some interior shots that were very necessary to the continuity of our adventure story. The building in which they were to be made had been altered, and the outside light cut down by the removal of several large windows that had been there in previous years and had allowed plenty of daylight to get into the building. We radioed at once to Seattle for Photoflood lamps and reflectors. In due course one of the party who had been held up in Seattle by the strike, arrived at False Pass with the Photofloods, but no reflectors. We needed concentrated light; after another huddle we emerged with the problem licked. We happened to have with us some prints of old features that had been given to Father Hubbard by various film companies to show to the Aleut Indians who had never seen a movie before. We confiscated a number of 1000-foot film cans from this lot and went to work. Ed Levin,

Shooting

field manager of the outfit, made eight stands consisting of a wooden base, an upright, and a top arm designed to hold one of the thousand-foot cans at each end. The top arm was movable and had holes drilled through it at one-inch intervals, as had the upright. This enabled us to raise, lower or tilt the lamps as we desired by merely loosening the bolt that held the top arm to the upright and shifting the whole top arm to whatever combination of holes we needed. A couple of flips of the bolt with a wrench and the lamps would remain rigid at any height or angle. After the cans were attached to the top arm, the wiring and installation of lamp sockets in the center of the cans was a matter of a few hours. We took our juice from a standard A.C. plant by means of a lead cable to which we had spliced a couple of dozen standard female plugs at convenient intervals. One male plug took care of the two lamps on each of these improvised lights. The efficiency of these improvised "inkies" was remarkable; they proved to be very flexible and a review later of the shots made with them, showed them to be very satisfactory. In fact, I'd wager the average technician would think we had a battery of real lights and a bunch of juicers to run them.

Another unlooked for problem grew out of the continual rains, landings in the surf, stream crossings, mud, quicksands and pumice dust in volcanic areas that we encountered during our six months' trek in the most forbidding country you'd ever want to set foot in. After a couple of months of exposure to all these, we found our Eyemo tripods, of an approved standard make, to be wilting. They couldn't stand the gaff. Despite all precautions, rust got the better of the heads and they became loose and the sliding legs filled up with so much mud and pumice dust they finally wouldn't budge. On our return to base camp we attempted to repair them, but without necessary replacement parts it was useless. Once more, another huddle. We always carried with us a sturdy alpenstock—better known as an ice-pick. Each member of the party had one. They range from three to three and one-half feet long, have a spike on the ground end, and a combination of a mattock blade and a pick blade on the other end. They are used for cutting steps in the ice, gaining a hold while climbing, and feeling your way for crevasses and other hidden ground dangers as you trek along. We drilled holes in the metal hub of the pick end of the alpenstocks and fitted them with a screw lug of proper diameter to fit the tripod hole of the Eyemos. To protect the threads of the lug, the hole in the hub of the ice pick was drilled deep enough to take its entire length when not in use. The lug had a screw head and could be raised above the level of the flat-headed pick with a screw driver or more frequently with the hunting knives we always carried. The ice pick tripod thus evolved was invaluable to us. For cam-

The Glaciers in Alaska

by

Nicholas Cavaliere*

Chief Photographer,
Father Bernard Hubbard, S.J.,
1934 Alaskan Expedition

*Cavaliere was also first cameraman with Frank Buck, having filmed "Wild Cargo" and "Bring 'Em Back Alive" for the noted wild animal hunter.

era use, we would stick the spike end well into the ground, which would give us a "unipod" as efficient as a tripod. You could even get a steady pan shot by grasping the pick and mattock ends and turning the whole pick in the ground slowly and evenly. Hand-held Eyemos may be alright, but I've yet to see a rock-steady picture taken in this manner. Our ice-pick tripods saved the day so far as the practical use of our Eyemos was concerned; in addition, there were no parts to lose or rust—simple, but effective.

Sometimes it's the little things that give you more trouble and can cause more damages than the big ones. Our cameras were protected by all-metal carrying cases. The cases did their work well for three or four months; then their constant exposure to rain and dampness caused the rivets holding the hinges to rust off the covers, giving the cover a bad fit and allowing mud, wind-driven rain and pumice dust to get inside the cases. Only constant vigil and a cleaning of the cameras every morning and night as well as a good oiling, kept them from being damaged seriously by rust. On another venture such as this, I'd see to it all camera carrying cases were made of all metal, non-rustable, with equally non-rustable hinge fittings and locks. This would have saved a lot of anxiety concerning damage to cameras.

More than once, some of the five-can negative film containers on which the seals had been broken would fill partially with water when we landed our small dories on beaches. Dories were the only practical means of landing from our expedition ship "Amelie" on uncharted shores where there was always danger of hidden rocks and reefs close in. This caused us considerable anxiety, especially for our exposed film. We finally overcame this hazard

by taking ordinary canvas dunnage bags and treating them with a waterproofing liquid we had on hand on the ship. We placed all our exposed material and open containers in these bags when making dory jaurneys to and from our expedition ship, and were successful in keeping salt water away from most of our film. On another venture such as this I'd be sure to take along a number of waterproofed bags of various sizes designed to hold the various containers of film you take along with you on each leg of the trek. Our pack dogs were our most important means of film transportation while on land. Everytime we came to a stream, we had to remove the dog packs to keep the open containers from shipping water when the dogs forded the streams. Waterproof bags would have eliminated this troublesome procedure, which oftentimes caused us considerable delay in reaching our objectives. Continual rain would even reach film stowed in the depths of our own pack sacks. Here too, waterproof bags would have relieved considerable anxiety. There are plenty of other things to worry about on an expedition into virgin country. It is impossible on an expedition of this nature to carry nothing but hermetically sealed containers from camp to camp since it is always necessary to open some of them to obtain film for shooting while en route.

Needless to say, a changing bag is a very necessary requirement for reloading. We had all sorts of adverse weather to keep out of changing bags, and all sorts of places, most of them bad, where it was necessary to reload. A waterproof changing bag would have been a gift from Heaven; for in a country where eleven days of straight rain was nothing unusual, it's more than hard to keep a changing bag dry.

All in all we covered 8000 miles of water in six months and many on land which included Bogoslof, the famous "disappearing island" of the Bering Sea with its giant sea lions; the hitherto unexplored and unclimbed "Aghileen Pinnacles" on the Alaska Peninsula; the famous "Valley of 10,000 Smokes," with its spectacular steams; the Columbia, Malespina, Hubbard, Mendenhall and Taku glaciers, where giant icebergs are born. Lady Luck and precaution brought us home with nearly 100,000 feet of usable material and a great deal more camera-wise as to what we really needed in the line of equipment in addition to what we had thought we needed for expedition camera work, or for that matter, any trip into outdoor country where you're likely to run into similar conditions such as we did.



An Eyemo mounted on an "ice-pick" tripod. This had to be pressed into use when the dust and rust made our regular tripod unusable.

Will Color Help or Hinder?

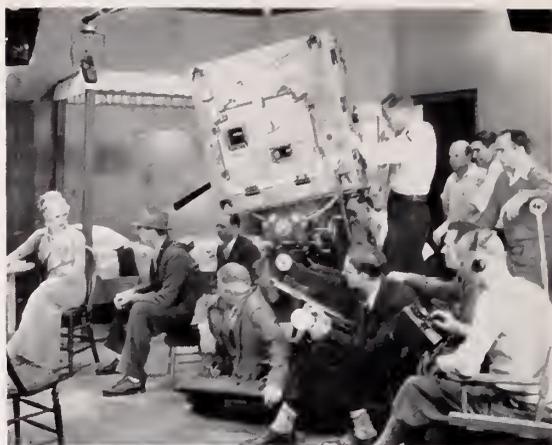
by
William Stull, A.S.C.

THE INTRODUCTION of Technicolor's Three-Color process of natural-color Cinematography, together with the release of "Lo Cucaracho," has split the film world into two argumentative camps. On the one hand are those Cinematographers, Directors, Art-Directors and Executives who are confident that the new process heralds a revolution as sweeping as that brought about by sound. In the other camp are those who feel that, although color is interesting, it can play no really important part in the dramatic and artistic advancement of the cinema.

Two things only are certain: first, that the new process eclipses anything heretofore possible in natural-color cinematography; and second, that it is historically obvious that no previous "color boom" (even the two-color Technicolor boom of 1929-30, which saw 77,000,000 feet of major-studio releases Technicolored) has produced a lasting impression upon our monochrome film world. Moreover, the list of all-time box-office champions fails to show a single all-color picture, though several films are included which boasted color sequences. This, the colorists retort, proves nothing, for few, if any of the earlier color-films included the elements of outstanding success, but depended chiefly upon color—imperfect color, or that—for their popularity. Moreover, say the colorists, the new process is something artistically and esthetically different from its predecessors.

If this is true (and there is much evidence to support it), any speculation, based upon previous conceptions of or experience with two-color processes, attempting to forecast the future and potentialities of the new, three-color process, would be ill-founded. Therefore, the only logical authorities on the subject are those who are currently using trichrome in actual production. Most important of these are, of course, the Producer, the Director, the Art-Director, and the Cinematographer.

The Producer of "Becky Sharp," the initial trichrome feature, is John Hay (Jock) Whitney. His confidence in color is rather obvious from the fact that he is reputed to have invested \$7,000,000 in the formation of Pioneer Pictures, wherewith to pioneer all-color production, as well as having invested heavily in Technicolor, itself. As he is not noted for backing unlikely argosies, it is evident that he believes in color.



At top Technicolor camera and camera crew set for a take in the all-color feature "Becky Sharp." Below Robert Edmond Jones, famous stage designer, who designed sets and costumes for "Becky Sharp."

"Becky Sharp's" color designer is Robert Edmond Jones, unquestionably the foremost designer-director of the theatre. The term "Art-Director" is actually only a pale description of his activities, for he is in truth for more—a sort of chromatic supervisor of every detail of the production. Not only did he design settings and costumes, and plan the coloring of every scene: he outlines the chromatic composition of every shot, and serves on the set almost as a co-director and co-cinematographer.

Jones is enthusiastic over the possibilities of wisely created color-films. "With the new process," he says, "the possibilities are unlimited. Rather, they are limited only by the intelligent artistry with which the color is employed. And here I must stop to pay tribute to Technicolor's new process: it is very nearly perfect; it has nothing in common with any previous process, so far as results are concerned, for it does not distort colors, or give the 'woolly' results we have had heretofore. If you give it a color to photograph, it will give you back that same color on the screen, unchanged.

"Fully realizing my lack of qualification as a prophet, I am none the less confident that the introduction of this new process is going to bring about a change in screen methods comparable only to that brought about by sounds. Not so quick, certainly, nor so devastating; but once a few really good color films have been released, the Industry will have to become color-conscious.

(Continued on Page 106)



PHOTOGRAPHY

of the MONTH

"MYSTERY OF EDWIN DROOD" (Universol)

George Robinson, A.S.C.: Directing Cinematographer
 Daily Variety (January 17, 1935): "Photography by George Robinson is excellent."
 Hollywood Reporter (January 17, 1935): "—and the picture has been exceptionally well photographed."
 Motion Picture Daily (January 19, 1935): "The photography of George Robinson is excellent."

"MURDER ON A HONEYMOON" (Radio)

Nick Musuroca, A.S.C.: Directing Cinematographer
 Daily Variety (January 21, 1935): "Photography by Nick Musuroca and special effects by Vernon Walker are top notch."
 Motion Picture Daily (January 22, 1935): "Nick Musuroca and Vernon Walker are well teamed on photography and effects."

"RHUMBA" (Paramount)

Teddy Tetzlaff, A.S.C.: Directing Cinematographer
 Hollywood Reporter (January 23, 1935): "Photography by Teddy Tetzlaff was unusual."

"WHEN A MAN'S A MAN" (Fox)

Frank B. Good, A.S.C.: Directing Cinematographer
 Hollywood Reporter (January 25, 1935): "Photography fine."
 Daily Variety (January 25, 1935): "—while exteriors by Frank Good provide some very beautiful camera setups."

"VANESSA, HER LOVE STORY" (M-G-M)

Ray June, A.S.C.: Directing Cinematographer
 Daily Variety (January 25, 1935): "Photography of Ray June is excellent."

"THE NUT FARM" (Monogram)

Harry Neumann, A.S.C.: Directing Cinematographer
 Daily Variety (January 26, 1935): "Photography creditable."
 Hollywood Reporter (January 26, 1935): "Photography A-1."

"\$20 A WEEK" (Ajax)

Arthur Martinelli, A.S.C.: Directing Cinematographer
 Film Daily (January 22, 1935): "Photography 'Foir.'"

"SHADOW OF DOUBT" (M-G-M)

Charles Clorke, A.S.C.: Directing Cinematographer
 Hollywood Reporter (January 28, 1935): "—and the photography is first rate."
 "Charles Clorke's photography is once high—."

"DEVIL DOGS OF THE AIR" (Warner Bros.)

Arthur Edeson, A.S.C.: Directing Cinematographer
 Hollywood Reporter (January 30, 1935): "Photography and mounting are first rate."
 Daily Variety (January 30, 1935): "Arthur Edeson's photography is exceptionally good throughout the entire picture."

"AFTER OFFICE HOURS" (M-G-M)

Charles Rosher, A.S.C.: Directing Cinematographer
 Daily Variety (January 30, 1935): "Photography is overage—."
 Hollywood Reporter (January 30, 1935): "—and that Charles Rosher is on once cornerman—."

"THE GOOD FAIRY" (Universol)

Norbert Brodine, A.S.C.: Directing Cinematographer
 Daily Variety (January 31, 1935): "Photography is excellent."
 Hollywood Reporter (January 31, 1935): "Photography of Norbert Brodine is excellent."

"ONE MORE SPRING" (Fox)

John Seitz, A.S.C.: Directing Cinematographer
 Hollywood Reporter (January 31, 1935): "John Seitz photographed beautifully."
 Daily Variety (January 31, 1935): "Photography by John Seitz is okay—."

"LIFE BEGINS AT 40" (Fox)

Horry Jackson, A.S.C.: Directing Cinematographer
 Daily Variety (February 1, 1935): "Photography and production are both good."
 Hollywood Reporter (February 1, 1935): "Photography by Horry Jackson, top-notch."

"RUGGLES OF RED GAP" (Paramount)

Alfred Gilks, A.S.C.: Directing Cinematographer
 Hollywood Reporter (February 2, 1935): "Photography by Alfred Gilks very good."
 Daily Variety (February 2, 1935): "Photography and production are both excellent."

"THE LITTLE COLONEL" (Fox)

Arthur C. Miller, A.S.C.: Directing Cinematographer
 Hollywood Reporter (February 6, 1935): "—and Arthur Miller's photography is excellent—."
 Daily Variety (February 6, 1935): "Arthur Miller's photography is good, especially when he focuses on Miss Temple."
 Motion Picture Daily (February 7, 1935): "Arthur Miller's photography is good."

THE CAMERA'S OMNISCIENT EYE

(Continued from Page 93)

camero, and acute - perspective lenses are some of the more glaring faults. All of these instrumentalities are of great intrinsic power when proportionately suited to becoming a part of a dramatic intensity sufficient to absorb their punch in a unitary balance of contributive stimuli.

However, as the screen matures and the various dramatic and pictorial elements are unified, dramatic cinematography will be more incisively rationalized; and through this restraint and refinement the screen will gain a more consistent power of expression, since less of its substance and form will be wasted on content of insufficient intensity or disharmonious mood.

There is another consideration while on the subject of the omniscient eye, that of "compression." While the camera sees and points out "the one right thing at the right time," it is implied that the one thing may be and usually is, the sum-effect of a number of contributive stimuli. It is this intrinsic wealth of stimuli, plus the cinema's exceptional synthetic facilities, acting together, that pack into so brief a space of time such a rich field of experience for the percipient. That is, through the concurrent interlocking and emphasizing of a number of pantomimic and literary symbols of specific human significations, with symbols of human, material, onimote or inonimote, abstract signification, a great web of affective thought is generated in the percipient very rapidly within a few scenes. Whereas, for the sake of comparison, if it were possible for a like mass of stimuli to be absorbed exclusively from the written or spoken word, many pages and much time would be consumed in arriving at the same juncture of percipient experience. And, due to their relatively restricted type of stimuli, the written or spoken word alone cannot approach in intensity the vibrating brilliance of the highly compressed cinematic experience. It is, again, this faculty of extreme compression which helps to give the motion picture such outstanding influence.

Going one step further in our discussion; through the camera's omniscience there comes to the percipient not only the richness of things and thoughts derived through the senses, but of even more potent experiences derived almost entirely through imaginative construction. For at certain times, omniscient perception requires the complete or nearly complete cessation of physical activity or other stimuli on the screen and the continuation of cinematic movement within the percipient's mind alone, with infinitely greater effectiveness than actual screen representation. Not only dramatically is the purely sub-

jective most powerful, but oftentimes, with regards for human sensibilities, it is the one right way to interpret.

In conclusion: for each instant of the picture's duration there is but one best point of perception for the camera lens. It is for the Director of Photography to understand the implications of the story's theme and philosophy, the psychology of the story's dramatic structure and of the story characters, during each of the synthesized moments of occurrence relative to the whole picture-percipient experience. Thus, in the individual shot, the indicative and relative dramatic-pictorial factors intersect at a focal point, and this photo-dramatic

Photography Should Interpret

Personality and Character

(Continued from Page 97)

to the study of proper lighting and backgrounds for the further developments of the subject's characterization. It is due to this extensive and untiring effort on the part of the successful cinematographer that he is able to stay in the front ranks of the art of cinematography, in this field of ever-changing methods, new inventions, and radical and revolutionary introductions.

It has often been claimed that cinematographers are born and not made. This is partially true and partially false. The cinematographer must be born with the ability to understand the psychological, dramatic and true characterization of the subject he is photographing. On the other hand, he must learn, through study and research, the possibilities and the rational assimilation of the machine with which he is working. Good cinematography is one of the best educations toward a rounded sense of reality. Restoring to the eye, otherwise so preoccupied with the obstructions of print, the stimulus of things roundly seen as things, shapes, colors, and textures. When this has been learned, the cinematographer will then be able to give shape and significance to the story's most remote symbols.

The facts pointed to in the beginning of this article have been proven by my own career. I was not born a DaVinci, or a Michael Angelo. Although I, too, came from Italy, it was my lot to arrive in the United States an immigrant, without knowledge of the English language, and far less knowledge of photography in any of its phases. Yet, through constant study and research of the then infant field of cinematography, managed to lay a foundation upon which my pres-

optimum is **the one** set-up (static or mobile) for the particular subject-matter at the instant. And, as the course of the story is traced through sequence after sequence, the cinematographic eye moves where it will in its omniscient seeing.

So it may be said generally: Always use that unique faculty of participation inherent in the motion picture to the limit of its effectiveness, in order that the percipient realize the most pertinent and interesting ideas and facts in the story's evolution and substance (regardless of where the camera may be put to so record and interpret), **provided** there is a sustained "picture-audience unity of experience." Nor does it matter how varied the camera angles or how heavily they are punched **if** a consistently self-conscious and rising cumulation of "illusion of occurrence" prevails.

ent career and theories are based. It is, therefore, my belief, that any cinematographer to fully understand the true perspective of his art, must reach this understanding through past mistakes, made by both himself and others who delved deeply into the scientific field of cinematography.

The cinematographer must have for the basis of this cultivation, a direct and immediate experience of living itself. We must directly see, feel, touch, manipulate, sing, dance, communicate, before we can extract from the subject any further sustenance for character. If we are empty to begin with, the subject will be empty, and if we are passive, powerless and have not the feelings of the subject, how can we expect to inject into the film the one outstanding quality of motion pictures, human characterization?

Haller Places Stress on Detail

(Continued from Page 96)

to have on his sets in the way of set dressings, the color, textures and period the furniture and the other myriad of details that might be considered by many to be of no importance whatsoever.

There is no production too big for Haller to tackle. There is no such thing as too difficult, as far as he is concerned. With his training and methods of living, obstacles, which might be considered insurmountable, can be overcome with detailed thought.

Foreign directors, Haller believes, are the most difficult to please. Primarily because they think differently than the

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American ones, due to the fact that their early environment has been, by necessity, so widely contrasted to the life in the United States.

Again, this misunderstanding can be overcome by a detailed study of the person with whom you have to work. This has been given careful thought by Haller because during his years of experience, he has worked with many of the leading foreign directors.

He points out that if detail is wholly

and absolutely observed in every instance, the other qualifications which go to making a motion picture a thing of beauty and entertainment, such as vitality, richness of settings, and true characterization of the subject will be brought out in more pronounced sharpness. Because when the cinematographer strives toward detail he catches the one important movement which crystallizes itself out of the many unimportant gestures used in the course of the day.

ARTISTIC HONESTY IN CINEMATOGRAPHY

(Continued from Page 94)

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with; so essentially unreal in its conception that no effort could make it real in completion. I could not, from the start, believe in the actuality of what I was photographing; it touched no responsive chord in my experience-memories, and accordingly I could bring to its realization only technique—not sincerity.

It is entirely possible that in some other Cinematographer the same scene might have found the note lacking in my individual experience, in which case, regardless of whether he treated it with greater or less technical skill than I used, I am sure the scene would have been more convincing on the screen.

Of course, it is utterly impossible that any Cinematographer could have experienced situations and emotions absolutely identical with those of every scene he is called on to film: but his experience should be such that the majority of scenes will find some common factor in his memory. Same factor, that is, which will suggest how such a scene should naturally look—which will enable him to visualize the scene in photographic terms. You would not, for example, be able to correctly visualize the arrangement and lighting of a room in a modern home if all your life had been spent in an Eskimo igloo; you would be like a blind man trying to describe the color red! To draw perhaps a better comparison, how close could a man whose only experience of homes had been in the squalor of the slums come to portraying convincingly a scene laid in the home of a cultured millionaire?

This, I believe, is a factor too generally overlooked in all phases of production. Our aim in making moving pictures is to present stories and scenes which give at least an illusion of actuality. This illusion can only be attained when every phase of production—writing, acting, direction, settings and cinematography—strikes a keynote of sincerity based on experience. In other words, when all of the artists concerned are artistically honest—with themselves and with their work.

A vitally important—and neglected—factor in bringing this condition about is more closely coordinated preparation.

Times without number I (and every other Cinematographer) have finished a production one evening, only to start another one the following morning. On at least one of my recent films, I actually had no idea of the story until late the night before I started shooting! Under such conditions, no Cinematographer can possibly make his fullest contribution to the success of a production. It would be immeasurably better all around if Cinematographers were allowed more thorough preparation for each picture—a chance to study the script, and to work closely with Director, Art-Director and Costumers in planning and coordinating the details of production, so that the whole might emerge a better and more unified piece of work. This would probably result in fewer pictures per year for each Cinematographer—but they would be better and more successful ones. Incidentally, such a practice would go far toward spreading employment in our craft.

My own preparation for a picture, hampered as it usually is by insufficient time for tests, conferences and study, is necessarily brief. I try always to be familiar with the story, with the players I am to photograph, and with the settings and locations I am to use. When I am working with a star I have not previously photographed, I naturally try to make at least a few photographic tests before starting production. Before filming "Chained," for example, I had never photographed Jaan Crawford; therefore my first step was to study with Miss Crawford some of her favorite portraits, in order that I might get an idea of how she wished to look on the screen. Once I understood this, it was easy enough to determine the angles, style of lighting, and so on, required to present her in that fashion. Once more a case of first visualizing clearly how a thing should look, in order to be able to photograph it convincingly.

In actual production, I make it a



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point to pay as much attention to the treatment of the set itself as to the players. Essentially, of course, the set is simply a background against which the players enact the story: but it should be a convincing background. Therefore it should be treated with equal care. Actually a set serves two purposes. Not only must it be a convincing, believable background for the action, but it forms a vital part of the composition. Thus it should be lit not only with an eye to enhancing the effect of actuality, but to enhance the pictorial value. Careful attention to painting pictorial designs with light and shade upon set walls, for example, does much to heighten the pictorial effect, and if carefully done, does not in the least destroy the natural effect.

It is perhaps needless to say that the extent to which a Cinematographer can carry out his ideas depends greatly upon the Director with whom he works. Some Directors—like Richard Boleslawski, for instance—cooperate generously with the Cinematographer. Such a Director thinks in terms of pictures as well as action or dialog; accordingly, he sees to it that the Cinematographer understands the story and its aims quite as thoroughly as he does—and that there is ample time and cooperation for the production of every photographic effect that will make the film more perfect pictorially.

Other Directors may concentrate their attention on action or dialog, and more or less accept the Cinematographer as a matter of course. Others still, while not directly interested in the purely pictorial phases of the production, none the less realize that the camerawork is important, and cooperate largely for the mechanical perfection such cooperation makes possible. Each, in his own way, helping the Cinematographer to turn out a smooth, consistent, and uniformly well-photographed production.

The most difficult to work successfully with are the few who do not, apparently, visualize clearly themselves: it is like sorting out a jig-saw puzzle, for somewhere in a confused discourse upon the shortcomings of the casting-office, the merits of Saturday's football game, the blonde he dined with last night, and fragmentary comments upon scene and

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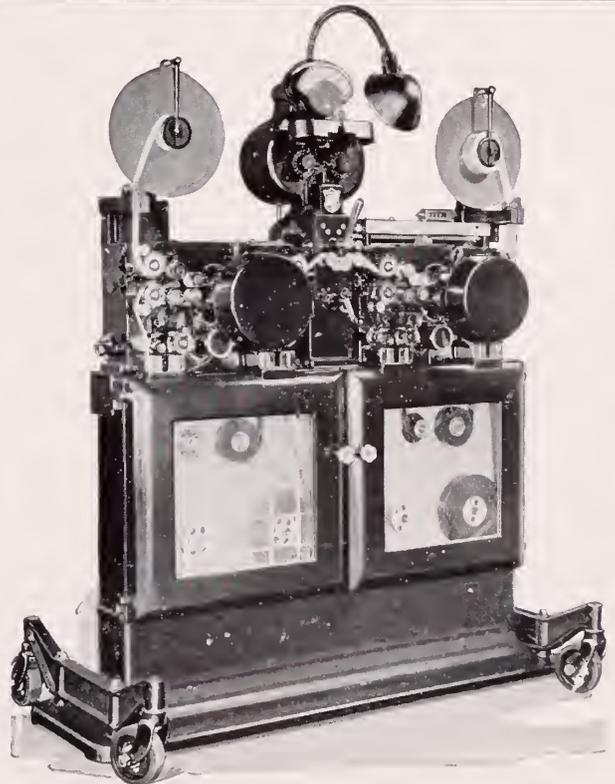
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script, is an idea of what he expects in the scene. It is interesting mental exercise, trying to find that idea—and forming a clear mental image of what is wanted!

Under ordinary conditions, success in Cinematography must naturally depend upon a number of circumstances: upon getting stories which allow some degree of artistic expression, upon adequate preparation, and upon a thoroughly cooperative Director. But most of all, success depends upon the individual Cinematographer's reservoir of experience, which should illumine his treatment of every scene, and upon absolute artistic honesty with himself and with his work.

High Intensity Mercury Vapor Lamp for Photographic Applications

(Continued from Page 93)

Portrait Work

The value of the new lamp in this field is problematical. To be sure, the older mercury vapor tube was one of the standard illuminants for portrait photography, and on the same basis the new lamp should prove equally effective. However, many photographers who are now employing portrait panchromatic films prefer an illuminant having all colors as it greatly reduces the amount of

re-touching necessary. The slow start probably would not be objectionable owing to the time the subject requires to get ready.

Color Photography

Owing to the practical absence of some colors, the mercury vapor lamp is quite unsuited for color photography if used alone.

It is entirely possible that the high intensity mercury vapor lamp could be used in those applications such as portrait and commercial photography, as well as color work, if some other source such as MAZDA lamps were incorporated in the equipment to fill in those parts of the spectrum where the mercury source is deficient. It would be necessary to enclose both illuminants in the same diffusing globe to prevent color shadows.

There are at present no reflectors available for the high intensity mercury lamp designed especially for photographic applications. Undoubtedly photographic manufacturers such as Johnson Ventlite Company, Halldorson Company, or Burke & James, all of Chicago, will place equipments on the market as the demand arises. The mercury lamp can, however, be used quite successfully in either the R.L.M. or the deep bowl aluminum reflectors designed for the 1000-watt PS-52 bulb lamp, with only a slight broadening of the light distribution. Of course these reflectors are best adapted to a downward direction of the light on account of the burning position of the lamp. For the copy board lighting, some form of trough reflector would be best suited.

On account of the weight of the control equipment the high intensity mercury lamp is limited to fixed installations in the studios.

Will Color Help or Hinder

(Continued from Page 100)

"Up to now, of course, the Industry has been anything but color-conscious. It has operated upon a black-and-white basis, and accordingly its people have trained themselves to think in monochrome. Now that we have color—and very good color—to work with, we must learn to think in terms of color. But color does not mean an abundance of color: this cannot be too strongly emphasized.

"In other words, Cinematographers, Art-Directors and Directors must learn to compose their pictures in color, as well as in line, mass and chiaroscuro. In this, I find that most people have quite a wrong idea of what constitutes a colored picture. Suppose we have an ordinary shot of a man in a room: to cite an extreme instance, some people would consider it enough to give the man a red necktie, and perhaps to put a bright carpet on the floor, or brilliant paintings on the walls. In the true sense, this is NOT a true color picture, even

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though the camera would reproduce the scene perfectly. In a true color picture, there must be a definite chromatic harmony between every bit of color in the frame—between the tie, the walls, the carpeting, the drapes, the furniture, and so on. Moreover, these factors must be arranged to give a good composition, not only in line and mass, but in color.

Cinematographers are accustomed to making their black-and-white compositions with feeling—composing with line, light and form to develop and enhance the complex combinations of feelings summed up as 'mood.' The same thing can and must be done in color-composition.

"Our language includes innumerable phrases linking color with the emotions—'crimson with passion'—'green with envy'—'white with fear'—'blue and dejected'—and so on. The very lack of color suggests a dull, drooping emotional state. All of this must be taken into consideration in planning and filming color pictures. Color must be used, not only as color, but as a dramatic, emotional tool, to build and maintain mood; and this, in conjunction with painstaking composition in color.

"All of this indicates that creative film-workers—especially the Cinematographers and Art-Directors—must develop a positive color-sense, or step aside for those who have such a sense. Since established film workers have had to train themselves to think in black-and-white, rather than in color, they are starting out under a fearful handicap, for they must utterly revise their mental processes if they are to keep step with the progress of the Art. I am not the only person in the theatre who has a reputation for thinking in color (though it is my good fortune to have been selected as the first color-consultant); and I am sure that if this picture succeeds as we believe it will, there will be a tremendous influx of stage colorists.

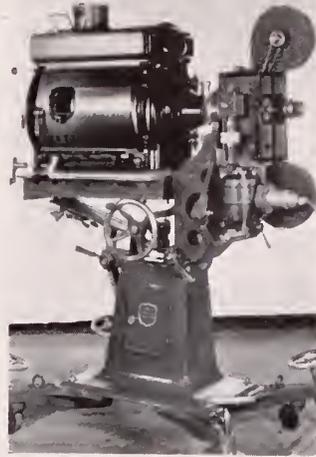
The only living Director who has worked with trichrome on a full dramatic feature is Rouben Momoulian, who succeeded the late Lowell Sherman as Director of "Becky Sharp." To him, color is an adventure—and a promise. "I enjoy this assignment tremendously," he told me. "Probably a great part of it is the thrill of consciously pioneering in a new field; but on the stage, before I entered pictures, I always tried to make the dramatic and emotional use of color play a vital part of my work—and I have missed its aid in making pictures.

"Color is at present in about the same stage of development as was sound when the first talkies were made: it is mechanically well developed, but no one has used it enough to be fully conversant with the artistic technique of applying it constructively to production. That is why we are going slowly and carefully on this picture, which is really

GEORGE J. TEAGUE

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"Do you remember when the first talkies came out, how carefully we recorded every slightest noise that might be 'natural' — every footstep, every rustle, every door-slam, even to eggs sizzling in a frying-pan? Well, up to now, color has been in exactly the same stage of development: we have had the means of bringing color to the screen,

and we have taken pains to see that it gave us plenty of color. From now on, we must be selective, using color intelligently, for its dramatic, emotional value as well as for pictorial purposes.

"I do not find that color—rightly used—conflicts with the dramatic elements of the story. It doesn't on the stage; no more should it in films, unless we make it do so by using it unwisely. Sooner or later, the majority of important pictures will undoubtedly be made in color. Up to now, the moving picture industry has been like an artist who was allowed only to use pencil or charcoal; now Technicolor has given us paints. In Art, there is a place for the monochrome line-drawing, even though color, in the form of oil paintings and aquarelles, is predominant. It is the same in pictures: color will undoubtedly become the dominant medium, but there will none the less be a place for the black-and-white film for some subjects, even as there is a recognized place for etchings. There will always be some stories which will be more fittingly told in monochrome, just as some stories (like 'The Last Laugh') even today would gain nothing from the addition of sound.

"The main thing today is not to get excited over color to the point where enthusiasm for color overbalances what we have already learned about film craftsmanship. In this initial period, it is only logical that we should use color on films whose subject and background offer, as in 'La Cucaracha' and 'Becky Sharp,' the greatest opportunities for effective coloration: but eventually we will surely find that the use of color—in costumes, in settings and in lighting—will be a definite aid to putting over dramatic and emotional effects in any picture, just as are lighting, composition, and tempo already."

Cinematographer Ray Rennahan, almost the only trichrome Cinematographer, definitely approves of color. "I like color cinematography," he said, "especially in this new process. It gives you a chance to develop effects of mood and actuality that can't be approached in black-and-white. Of course, we are largely back to arc lighting—but we used arcs before, and a lot of us complained when Incandescents drove them out.

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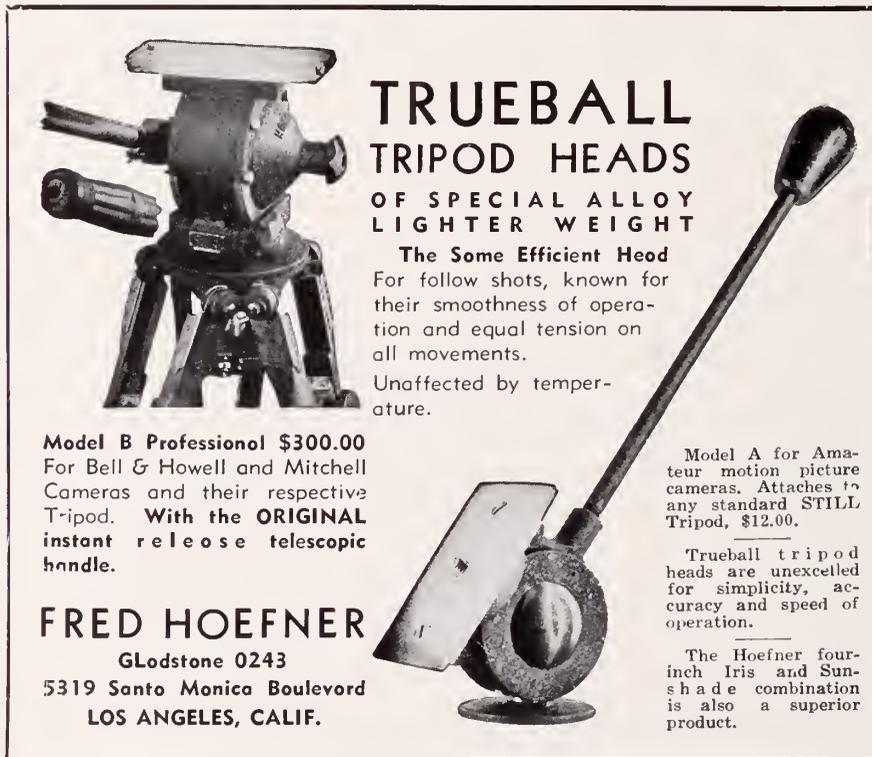
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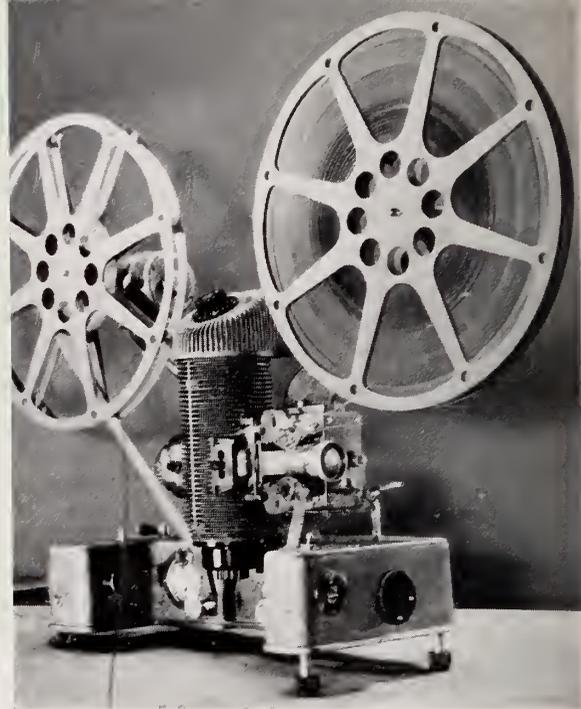
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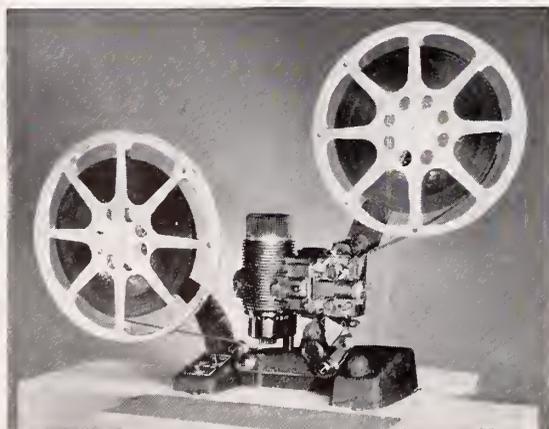
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AMATEUR MOVIE SECTION

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- Clyde DeVinna, A.S.C., will tell you how to use your library; what to read and how to read books on photography. There is much you can learn about photography from books; DeVinna leads the way.
- Grace will give us his second article on Makeup. In addition to that we have another article from him that he has called Perfection in Projection. It will interest you.
- Naturally there will be many other interesting articles and hints for the ambitious amateur.

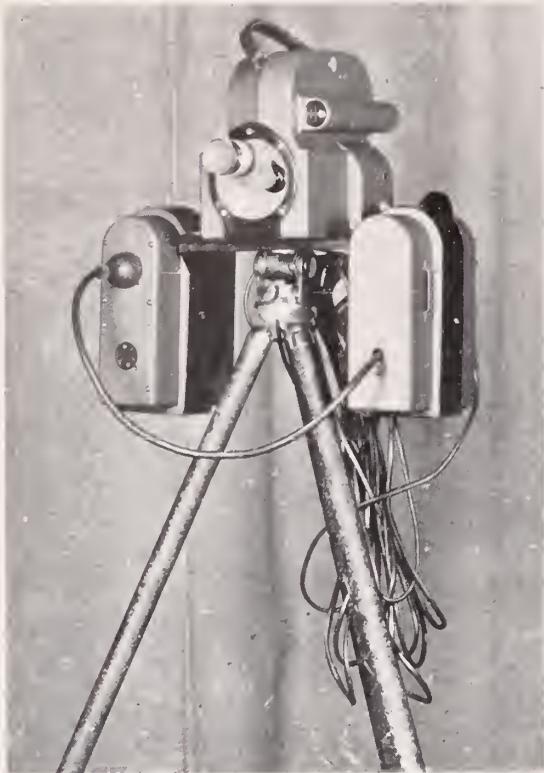


Fig. 1. A general view of 16mm sound and picture recording camera.

IN THE earlier stages of 16mm sound-picture progress, the larger part of the research was concentrated in the development of sound-on-disc equipment. However, the bulk and weight of such apparatus, coupled with the difficulty of securing proper synchronization between the disc and the film, turned this interest toward a sound-on-film system. A combination of sound and picture on the same strip of film was then proposed to secure exact synchronization and to reduce the bulk of the entire equipment. At first, those engineers who were involved in the realization of such a scheme found themselves confronted with the seemingly impassible problems of design, weight, cost, dependability, and simplicity of operation of such apparatus. Despite all the unfavorable comments and predictions, most of these problems have been solved one after the other.

At the present two important and distinct methods are used in producing 16mm sound-on-film pictures. In the first, sound and picture are recorded simultaneously and directly on a single strip of film by means of a specially constructed 16mm recording machine. A general view of such a camera with its auxiliaries, built by RCA Victor Company, is shown in Figure 1. In the second method, 16mm prints are made from the existing 35mm films using either re-recording or optical reduction of sound. This article will present a discussion of the latter of these two methods of producing substandard sound-on-film pictures.

Optical Reduction of Picture and Re-Recording of Sound

One of the two principal processes of preparing 16mm sound-on-film pictures from existing 35mm films consists in recording the sound and photograph on a 35mm nega-

Methods of

tive and preparing a positive print from it in the usual manner. The picture of this print is then reduced by optical reduction and its sound track is re-recorded onto 16mm film. The final 16mm positive film is obtained using the reduced picture and re-recorded negatives in certain printing processes which will be explained below.

According to the standards adopted by the Society of Motion Picture Engineers the dimensions of the standard 35mm sound film camera aperture are 0.868 by 0.631 inch while the corresponding dimensions on the standard 16mm sound film are 0.410 by 0.294 inch. Computing the reduction ratios in the two directions, it will readily be seen that different optical reductions are required in the horizontal and the vertical axes. Due to the introduction of such a difference in reduction ratios it is necessary to use a special optical system employing cylindrical lenses.

Furthermore, as the gap between successive picture frames in the standard 35mm sound film is 0.117 inch and the corresponding gap in the case of the standard 16mm sound film is only 0.006 inch, which is only a very small fraction of the first, it is not possible to make use of the continuous optical reduction printing when a dupe (duplicate) negative is not available. For this reason a specially constructed printer is devised, known as step-printer, which prints the optically reduced picture on the 16mm film frame by frame.

The re-recording of the sound on 16mm is very similar to the original recording of sound on standard film, and is accomplished by a recorder which closely resembles a reproducer. A light ray, traversing the already recorded sound track of the standard film, produces light variations corresponding to the variable densities or variable areas of the sound track. These light variations falling on a photo-electric cell create electrical impulses which in turn are transformed to light variations by means of a glow lamp. The alternating optical exposures so produced leave impressions of a new and reduced sound track on the 16mm film.¹

The optical reduction of the picture area and the re-recording of the sound track are usually made on separate strips of films. If the two operations are impressed on the same ribbon of film, a master 16mm sound-on-film is obtained.

Continuous Printing of Sound and Picture

The 16mm master negative carrying the combined picture and re-recorded sound, or the separate picture and

Producing 16mm Sound Films from 35mm Re-Recording and Optical Reduction

by
M. Margossian, B.S. (E.E.)

sound films, are used in preparing the final prints by means of printing machines. Figure 2a represents a general view of a Bell & Howell equipment which performs such a printing operation. Figure 2b is a close-up of the section of the same machine where the printing proper is performed. The printer is equipped with a three-way mask allowing either the picture area, or the sound, or both to be printed together. The setting in this particular case, as shown in Figure 2b, is for printing sound only. Obviously, both sound and picture can be printed on the one printer light setting when a master 16mm sound-on-film negative is available. With this equipment it is found preferable to use separate sound and picture negative, thus involving a double printing operation.

A similar equipment, produced by E. M. Berndt of New York, is shown in Figure 3. The apparatus again is designed to make a combined picture and sound print from either a combined picture and sound negative, or separate picture and sound negatives.

Summarizing the above, it may be seen that three different operations are involved in producing 16mm sound films when a 35mm print is available:

- (1) An optical reduction which consists simply in optically reducing the picture area of a 35mm print to fit the smaller picture area allowed for in 16mm raw stock.
- (2) A re-recording of sound which is merely the making of a new recording on the 16mm film from the 35mm.
- (3) And finally, a printing operation which transfers the sound and picture of a master 16mm sound-on-film

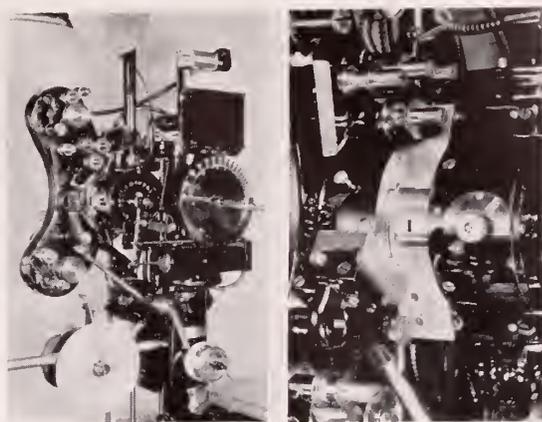


Fig. 2a. A general view of a Bell & Howell printing machine and at right, Fig. 2b, an enlarged view of Fig. 2a showing the location of printing mask.

onto a positive 16mm film stock through a direct printing process.

Optical Reduction of Picture and Sound

In the second method of preparing substandard sound pictures from existing standard films, both the picture and the sound are reduced optically.

The optical reduction of the picture, as explained above, is accomplished by using an optical reduction step-printer.

The optical reduction of the sound track, however, is performed by continuous optical reduction printing.² Figure 4 represents the original design of such a printer invented and designed by A. F. Victor. The upper reel contains the

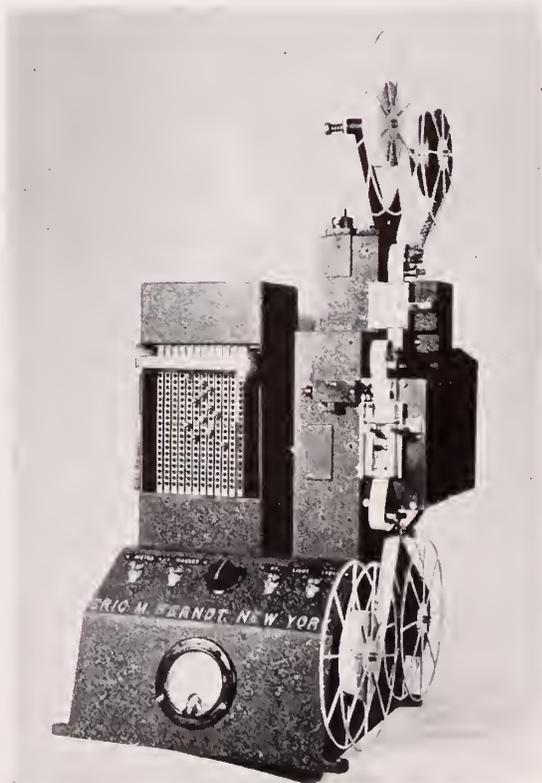


Fig. 3. Berndt Sound Printer designed to make combined 16mm picture and sound prints.

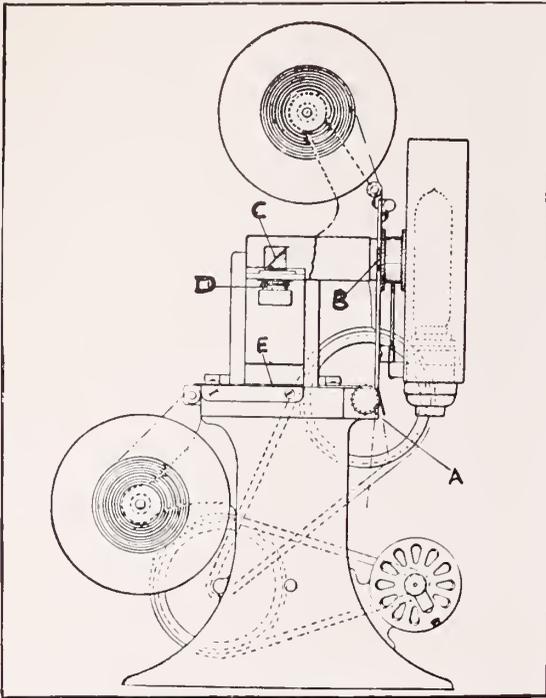


Fig. 4. Original design of continuous reduction printer made by Victor Animatograph Corp.

standard 35mm film, which is carried down past the slit B and wrapped around the sprocket A. As the standard film passes the slit B, the light beam is carried from this slit to the prism C where it is deflected downward through the lens D, the focused image of the frequency variations striking the point E. During the same time, the 16mm film, traveling horizontally through E, has the image of sound impressed on its track. Passing through E, the impressed 16mm sound film is carried on to the sprocket A where it is wrapped around a smaller diameter sprocket. The mechanism of modern reduction printers is somewhat different from the above equipment, but the basic principles involved in all of them are essentially the same.

Like the optical reduction of picture area, the reduction ratios of sound track in the longitudinal and transverse planes are different. Hence, an anamorphote or distorted-image-producing optical system is used, employing a combination of cylindrical and spherical lenses, or simply a pair of cylindrical lenses with an achromatic microscope objective disposed between them. Figure 5 represents the schematic diagram of such a system as used in RCA Victor Company's model reduction sound printer.³

In general, one of the following three methods is used to obtain the final 16mm sound-on-film prints by optical reduction of sound and picture:

(1) If the original master negative is available, the 16mm final print may be obtained by two direct optical reduction processes of picture and sound. Undoubtedly, this is the best method of making 16mm films as it involves less operations and preserves the quality of 35mm sound better, eliminating all contact printing operations which

would otherwise bring a definite loss in high frequency waves.

(2) Usually, the original master negative is not used in preparing prints to be released. Instead, a contact positive print is made from it on 35mm film stock. From this print a 16mm dupe negative is prepared by optical reduction; this dupe is then used to print the final 16mm prints with the aid of one of the printing machines as outlined above.

(3) A third method consists in preparing a dupe 35mm negative from which the 16mm prints are prepared by optical reduction. By this process the quality of sound preserved from 35mm would be somewhat better than in the preceding method since it involves one less printing operation.

From the above discussion it may be concluded that optical reduction of sound and picture is a simple process of producing 16mm sound-on-films from existing 35mm stock since it involves comparatively few operations. When a 35mm dupe negative is available, the 16mm print is obtained by:

(1) An optical reduction of picture, using step printing, and

(2) An optical reduction of sound, using continuous reduction printing.

Aside from its simplicity, this process, with its optical reduction of sound, yields somewhat better results than the first method where sound is re-recorded. It yields better results because it eliminates certain contact printing operations, thereby reducing losses of high frequency waves which are inherent to all contact printing.

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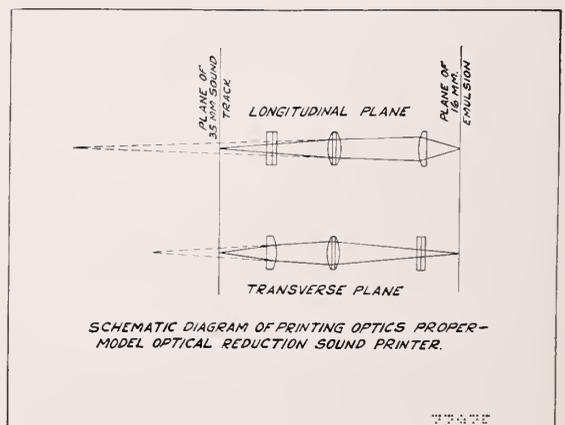


Fig. 5. A schematic diagram of anamorphote optical system of model reduction printer.



Tips on Home Projection

by

Ormal I. Sprungman

IF YOU project in your living room and do not own a suitable screen, a creaseless, water-soaked bed sheet, wrung out and hung up in a doorway will serve nicely in an emergency. Films can also be shown on light unpatterned wallpaper or dull walls, although some picture-luminosity will be lost. Use tracing linen for a "daylight screen." Set the projector **behind** the screen and give the film half a turn before threading. During the winter months, try projecting your movies through an open window on a smooth bank of snow for a novel effect. Scenes of swimming, sun-bathing and various summer sports will probably give your audience chilblains when viewed on this cold screen background. But it's worth a try.

There are many excellent screens on the market, but among the movie-making fraternity there are always several home-workshop enthusiasts who like to make their own accessories. For such amateurs, we suggest a combination silver and beaded screen, ideal for ordinary family group projection, which can be built inside a discarded 18x24 inch picture frame.

Remove the glass and picture-backing. Refinish the wooden frame a dull black. Hinge the upper left corner of the top of the frame and "slot" the back so that after

the tap is raised, a square of cardboard or plywood, silvered on one side and beaded on the other, may be inserted in place. Such a screen may be mounted atop the table or on the back of a door so that when the door is opened against the wall, the screen is hidden from view. Silver screen paint, obtainable from film supply dealers, is applied in the usual manner. In making a beaded screen, the surface is white enameled and tiny glass beads sprinkled over the half-dried paint. The coating must be applied evenly. Superfluous beads may be wiped off after the enamel has dried. To eliminate eye-fatigue, mount blue or purple-tinted Christmas tree bulbs on the back of the frame so that the soft light will make the screen stand out in relief.

If the projector is not kept in the same line with the screen, a distorted picture will result. In certain cases, however, this stunt can be used to give variety to your shows. By moving the projector to the right or left of the screen, short thick images result. By placing the machine above or below the screen level, the picture will be thrown at a tangent, thus exaggerating the height of the film characters.

Incidentally, the "best seat" in your showhouse can be determined by the following formula devised some time ago by experts from the Massachusetts Institute of Technology:

"Best seat" =

$$\frac{\text{distance of projector to screen}}{\text{focal length of camera lens}} \times \frac{\text{focal length of camera lens}}{\text{focal length of projector lens}}$$

The projector must, of course, be kept in good condition. It should be oiled regularly but not excessively or the film will become dirt-streaked. The film track and gate should likewise be kept clean to prevent film-scratching. Torn sprocket holes should be repaired at once and brittle reels moistened to avoid breaks. A felt pad or piece of inner tube placed under the machine will help to eliminate noise and vibration.

Black and white films may be projected in color by slipping yellow or red filters used for "still" camera work over the barrel of the projector lens. Likewise, a diffusion disc held in front of the lens will give pleasing, soft-focus results during projection. To "tone" a scene, allow a colored spotlight to flood the screen while the projector is running. The white in the film will remain unchanged, but the black, shaded portions will be replaced by the color of the spot light. Beautiful effects can be secured in this way by varying the colors.

Another method of projecting movies in color is by using an easily constructed "color wheel," which is made by removing the core from an empty 100-foot 16mm movie reel, covering the four openings with colored gelatine paper and placing the two sides of the reel flush together. If necessary, enlarge openings slightly. Next, mount the wheel in front of the projector lens so that by rotating the wheel, the light will pass through the tiny openings. Let one of the holes remain clear for ordinary scenes. Cement a light blue square of gelatine over one opening for cold winter scenes or night shots. Use yellow for thin daylight scenes. Over the upper half of the fourth opening cement a red piece, and over the lower half a green square for two-color variations in projecting beautiful sunsets and landscapes. Other colors may be used to suit individual tastes.

By setting a flawless mirror at a 45-degree angle in front of the lens and giving the film half a turn, it is

(Continued on Page 128)

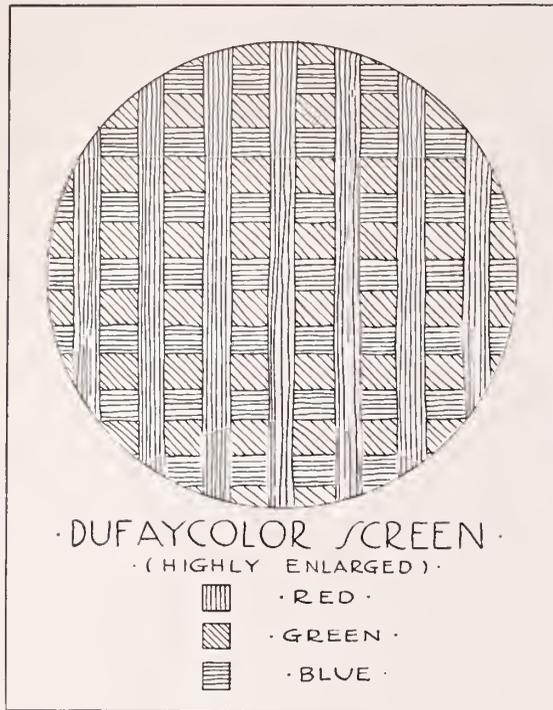


Fig. 1

AT THE conclusion of an article, COLOR and the MINIATURE CAMERA, written for this magazine last April, I stated that in all probability any new, important development in color photography would be applicable to the miniature camera.

This prediction has now been borne out, with the announcement that Dufay Leica Colorfilm will soon be available for miniature cameras using 35mm film. Although Dufaycolor film has been perfected primarily for use in the motion picture field, its first real commercial application in this country will be with its use in miniature cameras.

Both the advancement of color photography and the miniature camera user shall benefit from this decision of Dufaycolor Ltd. of London, to make Dufaycolor immediately available from the many Leica dealers throughout this country by the appointment of E. Leitz, Inc., as sole distributors of this film for miniature camera use. Surely this decision must come from the recognition of the important part that the miniature camera has played in the advancement of photography, during the past few years and from the belief that color photography under this same spirit of enthusiastic progressiveness, will likewise show marked advancement.

What is Dufay Leica Colorfilm? Perhaps a description of this film, here at this point, will do much toward dispelling the fears of the uninitiated that Dufaycolor is likely to be a complicated process, much too technical for his or her limited technical knowledge to master. However, that is not the case, for if you can make satisfactory negatives for black and white photography, then with no more trouble or extra camera equipment, you can make satisfactory color pictures. Dufaycolor does not require any special lenses or alterations to the camera. Also no filters are required for exposures made by daylight. I have used all of the different focal length Leica lenses with this film, with splendid results. Focusing these lenses by the conventional manner of using the range-finder, I found

Dufay Leica

that NO allowance need be made, under all normal conditions, for the fact that the film is loaded into the camera with the celluloid side toward the lens.

Dufay Leica Colorfilm comes in the conventional daylight loading roll of 30 exposures. This roll is loaded in the camera in the normal manner. It will, however, be noticed, that the film is so spooled that the celluloid or shiny side of the film will face the lens. (The reverse of black and white procedure.) This method of loading permits the color screen, which is an inherent part of the film, to act as color filters for the panchromatic emulsion with which the film is coated. Dufay Leica Colorfilm may be used in any of the miniature cameras that use 35mm film, viz. Leica, Contax, Super-Nettel, Peggy, Retina, etc.

Although Dufaycolor is a single film, it is made with two distinct coatings; the color screen and the emulsion. The color screen, or reseau as it is termed, is first printed upon the celluloid film base. This reseau has a distinct pattern as is shown by Fig. 1. There have been several different patterned color screens used for Dufaycolor. The reseau shown in Fig. 1 is the type of screen that is now in use for film coated in this country by the DuPant Film Mfg. Corp. for Dufaycolor Ltd.

It will be noticed in Fig. 1 that alternate parallel lines and squares of color form the reseau. These rulings are so fine that they cannot be perceived by the naked eye. There are about 1000 of these rulings per inch, or about 1,000,000 color units per square inch. The drawing shows these rulings as they appear under a 235 power microscope. When Dufaycolor film is projected from a stereopticon, the pattern formed by the rulings is noticeable only upon very close inspection of the projected image. From the normal viewing distance of the projected image, at no time are you conscious of any color screen pattern. The images are extremely sharp with a pronounced stereoscopic illusion and possess a charmingly artistic appearance.

After the color screen or reseau has been printed upon the celluloid base, it is covered with a layer of synthetic resin. This isolates the reseau from the emulsion, thereby preventing the dyes of the screen from diffusing into the emulsion during the film's subsequent development and reversal. Over this layer of resin is applied the highly sensitized and well color balanced panchromatic emulsion.

The principle by which Dufay Leica Colorfilm makes pictures in natural colors is very interesting. It is based upon the Newtonian theory that the spectrum may be split into three primary colors, viz. red, green, and blue-violet. These are the three colors that are used in the Dufaycolor reseau. Fig. 2 shows how Dufaycolor reproduces the colors of the visible spectrum and also black, grey, and white. The letters R, G, and B in Fig. 2 indicate respectively the red, green, and blue-violet filters of the reseau.

When a strip of Dufaycolor film is exposed in the camera, the following action takes place. The minute color filters in the reseau pass some color rays wholly, or par-

Colorfilm for Miniature Cameras

by
C. W. D. Slifer, A.S.C.



Alfred O. Traegerm, president of E. Leitz, Inc., who this year celebrates his twenty-fifth anniversary with that organization.

tially, or stop completely others; depending upon the color of the light ray and upon the filter or filters that it falls upon. In this transmitted ratio they affect the panchromatic emulsion immediately behind the reseau. This emulsion during the course of development and reversal becomes a positive. Thus when this positive is viewed by transmitted light, it permits the light to pass thru the color screen or reseau in the exact and original ratio, thereby giving a picture in natural colors. See Fig. 2.

The exposure required for Dufay Leica Colorfilm, coated with DuPont panchromatic emulsion in this country, is approximately one lens stop greater than that required for black and white photography. However, as this particular emulsion does not require the use of a color filter when exposed by daylight, it becomes as fast as black and white, super-sensitive panchromatic film, when this film is used with a filter in order to secure a true monochromatic rendering of the same object.

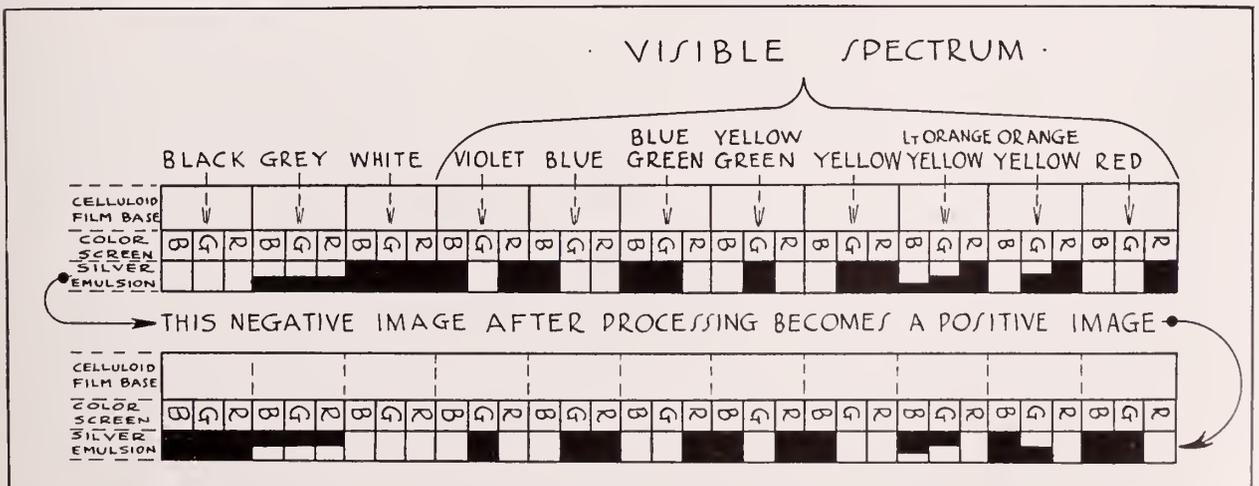
Correct exposure is the one essential in good color photography and the greater the contrast of your subject, the more necessary it becomes that your exposure is correct. The intelligent use of a good exposure meter is to be recommended. The Scheiner speed of this film is estimated at about 16 or 18 degrees. However, the speed of this film depends greatly upon the color of the light. I have made satisfactory exposures on Dufaycolor film at 1/500 part

of a second and also with a hand-held camera, I have made exposures of 1/4 part of a second at f2:0, long after sundown; shots of twilight silhouettes, street scenes, etc. So now for the first time we have a color process of sufficient speed to permit us to make color photographs under a large variety of conditions.

The processing of Dufay Leica Colorfilm is simple enough that all of those miniature camera enthusiasts who now develop their own black and white negatives may do it with good results. However, for those who do not care to process their own film, the many dealers that will distribute Dufaycolor film will be able to do it for them. At this point I wish to express my thanks to Messrs. Gilbert

(Continued on Page 127)

Fig. 2





Makeup material with Max Factor instruction pamphlets.

FOR THE past twelve months, this author has treated only the mechanical side of cinephotography—trick titling, animation, double exposures, speed control, lens and filter tricks—a side which I hope has appealed to the more technically-minded of my readers. However, by no means is cinephotographic perfection only possible from the camera manipulation, so, to round out the work, this series on makeup may prove of same value.

Some months ago several readers suggested that something along the lines of matian picture makeup might prove valuable to the amateur filmer, especially since so little is known or has been published in amateur magazines. Altho I knew some of the groundwork of stage makeup from experience in the little theatre, movie makeup was a very different thing, and the thought filled me with fear and trepidation. However, nothing tried, nothing learned, so off went a letter to Max Factor to find out what it was all about.

Max Factor Co. sent a dozen little booklets containing hints on the art of makeup, and after some study of the probable types to try for this series, the following list of materials was obtained. The last four items, however, were from the dime store.

Grease Paints (tubes), pancro No. 21-29 inclusive.

Face powders (cans), of corresponding numbers to the paints.

Shadows (small tubes), pancro No. 6, 21, and 22.

Lip rouge (small boxes), light, medium, dark, studio special.

Eyebrow pencil, brown.

Black masque, in box with brush.

White masque, in cake form.

Nose putty, two sticks.

Tooth enamel, one bottle each of white and black.

Spirit gum, with self-contained applicator in bottle.

Crepe hair, a yard each of black, brown, and white.

Paper liner sticks, two dozen.

Face powder brush.

Powder puffs, combs.

Box of cotton cleansing pats, about 3" square.

Small bottle of "new-skin" (collodian), with applicator.

Patches of "sticking plaster" (not adhesive tape).

You will find most of your movie makeup requirements will be pretty well taken care of with the materials just listed, and you will find also that these materials will last for quite a bit of makeup, because makeup is used sparingly for camera work. Naturally, you might want to go

The makeup kit opened with mirror and lights in place.

Dabbling

in far wigs after the straight makeup is under control, but let's let the future take care of itself for awhile yet.

In the booklets of Max Factor are shown several makeup cases, but after looking at the list of materials, we decided that none of the ready-made cases would hold all of it, and besides, we thought it would be possible to build in the lights and make it possible for two of us to make up at one time, so the case shown in the illustrations was designed and built. We've found it a most convenient carrying case as well as useful makeup case, because it's only 12" high and long, and 8" thick when closed. The weight loaded is about ten pounds.

The nine cans of face powder are stowed away in two sections, the cover of one carrying nine tubes of grease paint in canvas pockets. Other compartments hold the various smaller bits of materials, with removable covers. Two mirrors are so hinged that when an evening of making-up is to begin, excellent work before two lights can be done by two people at once.

It is not the intention of this, the first article of the makeup series, to sell either Max Factor makeup materials or the special makeup cases we made up. However, I believe you will find the quality of the Max Factor line so excellent and the convenience of the type of makeup case we built so inducive to many evenings of most interesting work, that you'll buy the makeup materials and make your own case. You won't be able to learn about movie makeup in one night, nor in two, nor in half a dozen, so by all means make your layout as convenient as possible, and if you live in an apartment as we do, make it so it can be packed away.

When I was connected with the little theatre during my college days, we used grease paint which came in long sticks. It was necessary to smear cold cream on the face



in Makeup Materials —Part One

by
Wm. J. Grace

before the grease paint was applied, and the paint was so thick one felt as if he were wearing a mask. Consequently, he was afraid to act naturally, because the paint "might come off." If you have had no experience with the newer Max Factor makeup, you're in for a delightful experience after having messed with the old thick paint. The new paint it as soft as toothpaste, and it comes in tubes just like toothpaste. Furthermore, you need to use only about a quarter of an inch of the paint—the same amount as you'd squeeze out of the old toothpaste tube.

There's quite a trick to applying the paint, as we'll see. That trick will be explained in next month's article, under the principles of makeup foundation. There is this to look forward to—this new grease paint will spread thinly, smoothly, and evenly, with absolutely no discomfort to the face of the most sensitive user. You won't feel at all as if you were wearing any "paint."

In this series of articles we are not going to attempt to approach what might be termed a high degree of professional work. We want, however, to see just what limitations there are for the amateur in spite of the fine materials at his service and in spite of the many reams that have been written about makeup.

You see the amateur approaches a technical subject, and makeup is technical, from a little different mental view-point. Some go at it with a bit of trepidation, while others assume it is as easy as washing your face.

Max Factor in his article in the Cinematographic Annual Val. I made this statement, "Makeup must start where nature left off." This is where we want to build types, where we must erase defects, that is things that will look like defects to the camera.

We read of cinematographers who recommend that the plain street makeup be used. Well, we amateurs are not clever enough with the camera, with the effect devices, to offset any blemishes our photographic subjects might have, so we must turn to makeup, and to learn about makeup we must use it, not occasionally, but often. Like anything else we may desire to do and do well, we gain perfection by doing and not by wishing.

But there isn't room left this month to do more than to invite you to write Max Factor, ask for his booklets and price list of materials, and then place your order and fix up a place or a case to try them out. By the time you've done these things, next month's article will be in your mailbox, and we can try some of the makeup.



Top photo shows convenient size of makeup case. Next photo shows case open; next with mirror and lights in position and bottom photo shows how the case can be used by two people.



Editing
Saves
Many Films

From Soup To Nuts

by
Ed. J. Ludes

ARE you, gentle reader, cursed (like me) by insurmountable projection difficulties? I, for instance, have but one projector and the time between reels is always an ogre—something to be feared. True, my audiences, like yours, are usually polite and condone those disgusting pauses simply because they have to, but this does not lessen the fact that a few minutes screen time is interspersed by nearly as much intermission between reels. I have spliced many of my subjects together and put them on larger reels but I find that I cannot do this to any great extent since my subjects vary in interest.

My racing pictures may be of interest to some of you,

but there are those who care not a fig for them, yet, would laugh with glee at the comedy I made during my vacation. And it's hardly fair to wade through 200 feet of racing stuff to show the comedy and vice versa. Of course, if I plan on showing the pictures beforehand, I could splice the film in decent order and show 400 feet at a time—BUT! I find that I show pictures most often on the spur of the moment—someone suggests a show—we set up the screen in one room, the projector in the other and shoot between the doors!

Now like all good amateurs I have a variety of subjects. Too many, in fact. That is why I have a lot of 100-foot rolls on hand. So I decided to do something about it. I'd read of how to save miscellaneous shots and make a completed reel out of them, but that was not my specific problem. I had to save miscellaneous REELS and make a SHOW out of them! My solution lay in approaching the subject from a different angle than anyone has heretofore attempted. I decided to write a show and then use as many shots as I could out of what I had (or could get). Here is the final reel:

Main title:

JOHN FILMER PICTURES
presents
"FROM SOUP TO NUTS"
A complete movie show
in 15 minutes

This was printed on a card and arranged to "swing" to one side after being read, thus exposing a new title behind, which read:

FILMER NEWSREEL
"The Glass Eye At The
Keyhole Of The World"

A quick title change brought:

DAISY'S MAN WINS SHAVING CUP

Champion Takes Coveted Trophy From
Field of Fast Starters. Coming From Be-
hind In A Brilliant Spurt, Famous Horse
Wins By Two Lengths!

Then followed a scene of the horses stomping impatiently at the post. A gun was fired, the barrier raised and the race was on. A telephoto lens took the race scenes—following the horses around the track. "Daisy's Man"'s fast spurt was clearly depicted as the famous horse rounded the three-quarter marker and led the field on the home stretch, finally crossing the barrier. These shots were interspersed with normal (one inch) lens shots (of another race) and the subject ended with the presentation of the cup and wreath to the winner (telephoto).

Then follow a number of various shots of the big lumber yard fire of several months ago, a thrilling series of skids on the local auto speedway, and several excellent views of the last parade.

As the last scene faded the original "newsreel" title was again flashed on the screen, but this time it was back-grounded (double-exposure) by a picture of Mr. Filmer cranking a humorous-looking camera made out of an old box. The title faded out to be replaced by:

THE END

—which faded leaving Mr. Filmer still cranking his pseudo

(Continued on Page 126)

Common Sense and Sound-on-Film

by
Henry T. Sharp. A.S.C.

ONE of my friends is going around the world. The other day he came to me and said, "Henry, I've got a great idea! I'm going to get one of these new 16mm sound-on-film cameras and bring back a talkie of my tour!" Then he launched into a lyrical description of the strange sounds and speech he would bring back—of how he'd capture the voices of his shipmates and acquaintances, and record his narrative comments right on the historic spots he filmed. Oh, it sounded beautiful—but it left me as cold as an Eskimo's nose.

You see, I tried it once.

To be strictly truthful, I suppose I'd better admit right off that I didn't do it in 16mm, but in 35mm, with one of the very first portable recorders. The result was Doug Fairbanks' "Around the World in 80 Minutes"—and a lot of grey hairs in the head of Mrs. Sharp's boy Henry. I wasn't particularly proud of either.

So I asked Bill if he felt equal to working as earnestly as a professional cameraman or director whose producer had given him a million dollars and orders to bring back a great picture. You've got to approach talkies from a virtually professional angle if you expect to get results that warrant the extra cost of the equipment—to say nothing of your hopes. You can't go at things in the haphazard, impromptu way you'd make a silent picture: there are too many factors you must have absolutely under control.

First of all, there is the matter of exposure, which always bothers the non-professional filmer. But if you're shooting sound-on-film, you'll have two exposures to worry about—the sound-track as well as the picture. They are side by side on the same film, and they've got to balance up within a reasonable degree. When I made my trip, I used the variable density type of recording, in which the volume at which you record governs the exposure of your sound-track; so I had two variable quantities to match up. Often, I'd strike conditions where I couldn't avoid giving the picture a very light exposure, coupled with loud (and therefore heavily-exposed) sounds. The result wasn't very satisfactory. Luckily, the modern amateur uses the variable area type of recording, in which the sound exposure is pretty nearly uniform for everything. This simplifies matters a good deal, for it reduces your problem to keeping the picture-exposure reasonably uniform. Of course, the methods used in processing the film help out to some extent, but even so, there's still a likelihood that you'll carry over the silent-film fault of most amateurs,

STANDARDS

Because of the standards set sometime ago the 16mm sound-on-film projector is built to take reversal film. Those desiring to make a negative first and then putting their sound into the film later will have to make a dupe of either their sound track or their picture. However, some few sound laboratories are arranging to run their recorder backwards to eliminate this.

and misjudge your picture-exposures even beyond the latitude of the film and processing-control. With silent pictures, this isn't so bad, for there is sometimes still a chance of retrieving valuable scenes by intensifying or reducing; but it's different in sound. Your sound-track is correctly exposed, and (whether you use reversal or negative film) reversed or printed correctly, more or less independent of the picture—so if you intensify or reduce the picture, you'll throw your sound off balance.

The only answer to that is to expose your picture correctly. Get a reliable exposure-meter and use it religiously on every shot. Don't just use it now and then, but **always!** And before you start out, find out just how much latitude you will have in your picture-exposure with the particular type of film and processing you'll be using. This means tests, and plenty of them. If, like Bill, you're going to be traveling in out-of-the-way places, where you'll encounter out-of-the-way light conditions, you'll do well to make and develop a test whenever you run into anything you aren't sure of. It's simple enough: all you need is a changing-bag and a little bottle of developer. M-Q tubes will do well enough, though the closer you can come to the solution used in the processing plant, the more accurate your test will be. (The Eastman D-9 formula*, and two-minute development will give an excellent idea of your relative exposures if you are using reversal film.) For your test, all you need to do is to break off a few inches of film (in the dark, of course—say inside the changing-bag), and slip it into the bottle of developer for the proper time. Then you can bring it out and inspect it: it's a good idea, by the way, to have a few strips of normally exposed and developed negative handy for comparison. After glancing at your test, of course, you can, if necessary, make the scene over again, properly exposed—or go on with the assurance that your shot is O.K.

Next, of course, comes the inevitable question of reversal film vs. negative-positive. The single-perforation film your sound-camera needs is available in both forms: granting that you have your negative developing done in a really good plant, you'll probably do well to use this system, for it will make it easier to edit, and to rectify mistakes in sounding. With reversal, your sound and picture are permanently joined together; but with negative, since the printing of sound and picture are two separate steps, you can eliminate the sound, or replace it with a new track, or even transpose it to another picture. But more about editing later.

(Continued on Page 129)



TRICKS and GADGETS

● Here's a gadget that many an advanced amateur is going to welcome with open arms. It is suggested by Charles and Robert Coles of New York City. They call it "An Accurate Frame Counter."

Cinefilmmakers Coles are photographers of no mean attainment. In 1933 they were awarded a medal in the American Cinematographer Amateur Movie Contest; this year they were awarded one of the prizes offered by the manufacturers.

The simplicity of this gadget, the fact that everyone can make it and that it can be made for practically any camera is going to give it a wide appeal now that everyone is attempting to secure unusual effects by winding the camera back for fades, lap dissolves, etc.

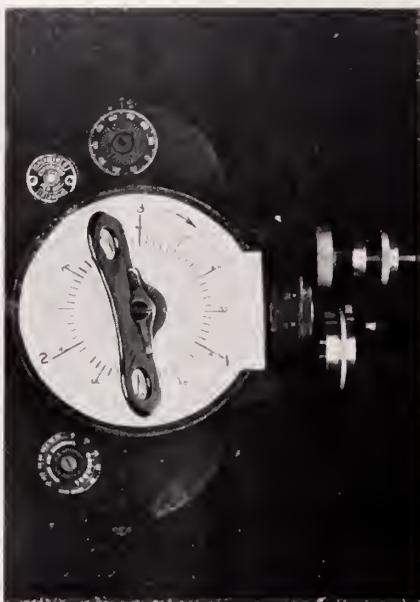
Coles discovered that the key of their camera when laid flat did not revolve, but when left standing at right angles to the camera, the key makes one complete revolution for every three feet of film passing through the gate. This was true with their Bell & Howell Filmo. What it will be with other cameras will have to be determined by the individual owners. You can take a piece of developed film, mark the frame in front of the aperture in the gate, set the key, mark the camera where the key starts, run the camera far one complete revolution of the key and then mark the frame in the gate of the camera in front of the aperture. Then count the number of frames that have run through. As you know, there are 40 frames to the foot. If it doesn't run exactly to the last frame of the foot, you can still make a dial like the Coles counter, but divide it to fit your camera.

Here's how Coles made his counter. A cardboard dial was made with a hole in the center. The circumference of the dial was divided into three equal parts, each sector representing one foot of film. Each third was divided into 20 equal parts, each one of these spaces then represented two frames. The camera key was removed, the dial put in position and the key replaced.

With this device on the cameras

which are equipped for winding back the operator is going to shout out several hurrahs for it will permit him to secure smoother lap-dissolves, or if he is making a split stage shot with a mask, he can rewind to the exact frame from which he started.

But there is the fellow who cannot wind back. Here is the way Coles rec-



ommend they operate. It will be necessary to make this wind-back scene the first on the roll.

When loading the camera, mark the frame of the leader which is behind the aperture with a notch. Then close your camera and run the camera to the end of the leader making careful note of the footage. Then turn the key backward by hand to the zero position on your new dial. It is now ready to count frames accurately.

Now when you turn the film back, take it into a dark room. Unload and wind the film back by hand so that the leader completely covers the film as it did when you took it from the factory package. Reload again in the usual way, placing the notched frame behind the aperture in the gate. Then watch your counter closely in running this leader off so that you stop at the same point you

stopped before to start your shooting . . . and there you are.

Accurate lap-dissolves are easy with this device. The film is loaded as described before and the camera run in the usual manner except that the key must rotate. When the time for the lap-dissolve arrives the scene is faded out as the key sweeps over one-third of a revolution, and the camera stopped. Accurate note of the readings of the footage indicator and frame counter dial is made, the film rewound in a changing bag and reloaded into the camera, again observing the details outlined above. The lens is capped and the film run for the exact point where the fade-out was begun and the camera stopped. The lens cap is removed, the camera started and the scene faded in as the key sweeps over one third of a revolution. Thus the timing will match the previous fade exactly.

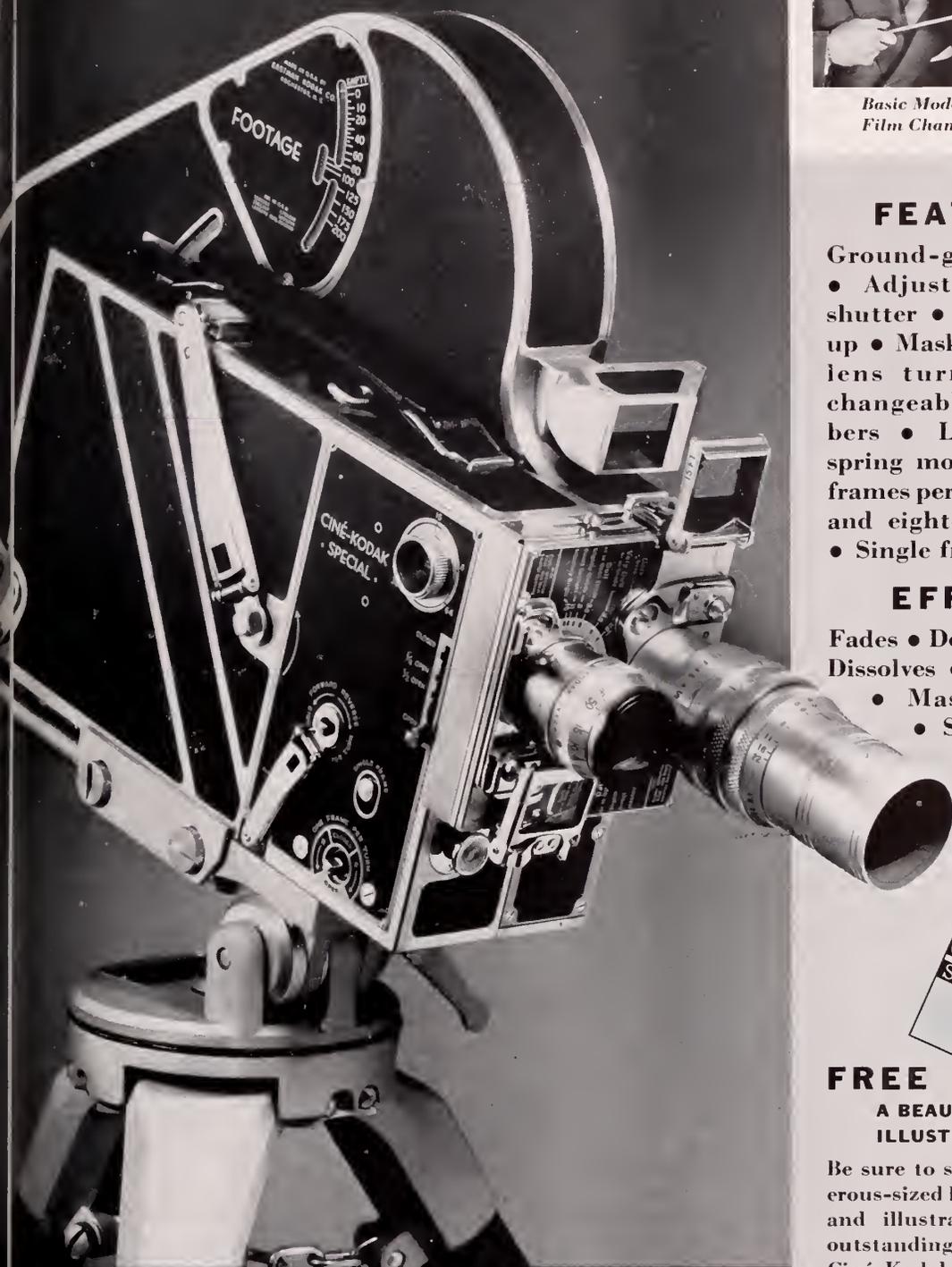
Process Backgrounds

● Several months ago we published an article by Jerry Ash, A.S.C., on how he made a picture in 16mm with process backgrounds and miniatures. For this he employed his projector and a ground-glass screen.

He told how he would expose one picture at a time and then take it one at a time with his camera. This same method, of course, could be employed in making titles with animated backgrounds. Or the ground-glass letters could be pasted. You could then show one picture from the projector, then photograph that picture and so on until you had enough footage to complete the title. If you then wanted this to work right into your picture you could then cut the original film that had been used for the animated background and superplant your title film. If your film used for animated background had action in it, that action would now synchronize and tie right into your action of the picture by this type of editing.

In view of the fact that all of your light is coming from the back your titles would be silhouetted and would therefore show black on the screen, for this reason you should not select dark scenes for this type of title work as the dark scenes would naturally blend right in with your titles and they could not be read.

**DOMINATES THE FIELD OF
16 MM. MOVIE MAKING**



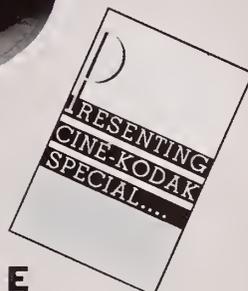
*Basic Model with 100-foot
Film Chamber in Position*

FEATURES

Ground-glass focusing
• Adjustable-opening shutter • Reverse take-up • Masks • Revolving lens turret • Interchangeable film chambers • Long-running spring motor • 8 to 64 frames per second • One- and eight-frame cranks
• Single frame release.

EFFECTS

Fades • Double exposure
Dissolves • Slow motion
• Masked pictures
• Speeded action
• Animation.



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*Only Eastman makes
the Kodak*

Cine-Kodak
SPECIAL

FROM SOUP TO NUTS

(Continued from Page 122)

I hate to brag but... try and beat me \$99.50 for \$99.50

I am the Famous Ampro Model "A" 16 mm. Projector

Like all thoroughbreds, I have the goods. Precisely made . . . aluminum die cast body . . . phosphor bronze bearings . . . silent gears . . . automatic high speed rewind . . . forward and reverse . . . still pictures . . . and light—plenty of it—my economical long life 400 watt Biplane Mazda is equal to 500 watt results.

Buy me on trial and judge for yourself. A thoroughbred projector at a price you can afford to pay.

Your \$99.50 cheerfully refunded if not satisfactory after ten full days trial in your own home. Complete with case. Order now.

Full details and Bass Bargaininggram is yours on request.

WANTED: More Live Dealers.

.. BASS ..
CAMERA COMPANY
179 W. Madison St., Chicago

Camera Headquarters for Tourists

camera. He, too, faded and was replaced by a flash-on title reading:

FILMER COMEDIES

presents

to this, in a slow fade in, was added: "LOVE TRIUMPHS".

Then followed 75 feet of an interesting cartoon which was purchased at a local dealer's supply store. At the conclusion of the cartoon another title "THE END"

is shown, to be replaced by:

FILMER MAGIC CARPET

Strange Happenings in Strange Places by Strange People as They Pursue Their Daily Habits.

The title faded out and the scene faded in with a view of the Metropolitan tower with its gigantic clock (at 12 o'clock noon). This was dissolved into a closeup (telephoto) of the clock face and then faded out. The following scene faded in on a small newsboy seated on the curb, holding his papers in one hand and munching a large apple which he held with the other. A dissolve brought into view a group of workmen eating lunch in the shade of a building they were wrecking. A telephoto lens here let the cameraman get close to the diners without their being conscious of the camera. Another quick dissolve disclosed a lunch wagon with its quota of noonday diners entering and leaving (some picking their teeth, which added much to the humor of the scene). Another dissolve brought to view one of the city's finest cafes, with well-to-dos going in and out. This dissolved to feeding time at the local zoo and the cameraman, through a series of very quick lap dissolves, showed the table manners of an alligator, a pair of hungry lions and a group of chattering monkeys. Another "END" title faded into:

JOHN FILMER PRESENTS

which was quickly dissolved to:

Lilo Sweet and Dick Strongheart

then, after a second or two, the word in

fades in, holds a few seconds more and the whole fades out and the following fades in:

"MANOR MYSTERY"

The main title fades out and the screen is left dark for at least five seconds. By this time the audience begins to wonder if you have failed (at last) in your splicing, but their interest is suddenly riveted again when, out of this same darkness, they see the beam of a flashlight—playing around walls and floor, finally coming to rest on a large picture hung on the wall. The light re-

mains stationary at this point while the camera (on a dolly or Junior's wagon) approaches the picture and finally stops at a closeup. Into the scene a hand stealthily creeps, grasps the frame of the picture and pulls it back from the wall, revealing a wall safe (cardboard and an old radio dial).

There is no use going into the drama from here, for each of you would have a different plot anyway, but I'm sure you get the idea. Good old MELODRAMA in its Nth degree, and there were plenty of laughs in each foot!

One really good scene, however, which provided the end of the plot, was so commendable as to deserve mention here, and was made as follows:

The heroine was in a dimly lit room awaiting the return of her hero (who has gone to investigate a noise in another part of the house). As she watches, a secret panel slowly opens behind her and a long black arm emerges and reaches for her shoulder. It closes and she is dragged toward the panel just as the hero returns and fires at the "RAT." The hand relaxes and the "RAT" falls to the floor, dead. The hero turns up the lights and the mask and tail ore pulled off the villain, disclosing the heroine's step-father, a disgraceful wretch who was trying to steal her money. The hero gathers the heroine in his arms as the scene fades into

THE END.

The secret panel shot had been made by the clever use of the door on Mrs. Filmer's ironing board cabinet; this door happened to be near the real doorway. The "RAT" was hidden in the doorway, but when the ironing board door was opened and the hand thrust forward, it gave the desired effect.

Immediately after the last title, was another of a humorous, yet practical nature, carrying out the original idea. It read:

FILMER THEATER GUESTS
May Park Free in the Hollywood Boulevard Parking Area.

This was backgrounded with a scene of the street in front of the house and always gets a big laugh from the audience. It was followed by a SCROLL TITLE which read:

PREVIEWS—

Coming to this Theater in the near future (we hope) more films of this same type. We hope you have enjoyed yourselves.

And now, if you will be kind enough to assemble in the other room you will find a buffet lunch is being served.

THAT'S ALL—THANK YOU!

Well, there it is! A lot to cram into four hundred feet of film you'll admit, but the necessity for brevity of each scene makes for its success to a great measure. One has no chance to be bored, for the subjects are constantly changing and the humor of the whole reel is apparent—even in reading this. You will want to use your own subjects, of course, but this outline can start you in the right direction toward making a real reel "FROM SOUP TO NUTS." Good luck to you filmers!

Dufay Leica Colorfilm for Miniature Cameras

(Continued from Page 119)

Morgan and Orville Krehbiel, of The Morgan Camera Shop in Hollywood for the cooperation they gave me during our experiments with Dufaycolor film and for their work in processing the many rolls of film used for these experiments.

The regular Reelo or Correx developing tanks may be used for the processing of the color film. During the reversal stage the film is unwound from the reel and exposed to light and then carefully rewound on the reel for the balance of the processing. A more convenient method of developing would be to use the glass developing drum outfit. The film can be placed on this drum and left there through the entire process.

The processing formulae used for Dufay Leica Colorfilm (DuPont emulsion) is as follows:

1. First Development

- Water up to (at 125°F.).....2000 cc.
- Metol 13 grams
- Hydroquinone 4 grams
- Sodium Sulphite, dry..... 100 grams
- Potassium Bromide 5½ grams
- Ammonia, spec. grav. 0.91..... 33 cc.

Dissolve the above chemicals in the order named, cool to 65°F. and add ammonia (if ammonia of stronger specific gravity only is available either dilute same or use proportionately less, according to its strength).

Development time in the above bath with correctly exposed subjects, 2½ to 3 minutes at 65°F.

2. Wash—One minute.

3. Bleaching Bath (Reversing)

- Potassium Permanganate 3 grams
- Sulphuric Acid 10 cc.
- Water1000 cc.

Bleach until image is clearly visible, time about 4 minutes.

4. Wash for about 2 minutes in running water.

5. Rinse for about 2 minutes in following clearing bath.

Clearing Bath—2½% solution of Sodium Bisulphite.

- Water1000 cc.
- Sodium Bisulphite 25 grams

6. Rinse after clearing.

7. Expose film to strong artificial light



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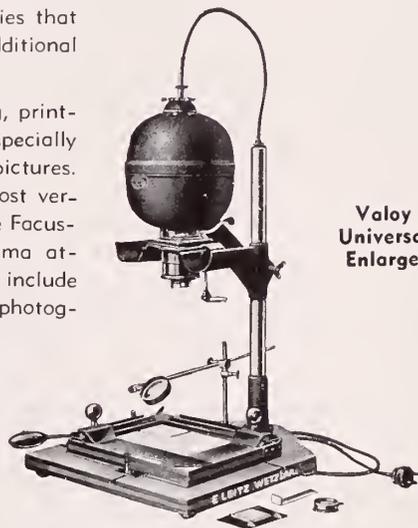
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(100-watt bulb) for about a minute or until the film begins to turn slightly pinkish. Then the film is redeveloped in any good metol-hydroquinone bath. The following may be used:

- Water up to (at 125°F.).....4000 cc.
- Metol 4 grams
- Sodium Sulphite, dry..... 200 grams
- Hydroquinone 18 grams
- Sodium Carbonate, dry..... 75 grams
- Potassium Bromide 4 grams

Time of final development, 3 to 4 minutes at 65°F.

8. Rinse

The film is now fixed and hardened, given a final washing, and then dried.

This processed Dufaycolor strip is now ready for projection. Fortunately for this process, there are several excellent pro-

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is equipped to develop and reverse the Dufay Color film at \$1.00 a roll.

Order your Dufay Color film from us. \$3.00 for 30 exposures.

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jectors for Leica pictures already available. It is a curious fact, that lower screen brillioncy is more acceptable for color than for block and white. So even

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the small Umeno projector (100-watt) is excellent for projecting nice size images in color. The color film pictures should be cut apart and bound between 2"x2" cover glasses. In this way the films are very convenient to handle and to project.

Dufoy Leico Colorfilm may be used for magazine illustrations. In fact it is being done in England at the present time. Recently, there appeared in a British publication some candid pictures made of King George. They were reproduced in full color and were almost 8 by 10 inches in size.

It is expected that within the near future, on economical means of providing color prints from Dufoycolor film, will be offered to users of this color film. This will certainly fulfill a long desired wish.

The future of color photography looks very bright, indeed. The rapidly increasing use of color photographs in advertisements and for magazine illustrations, indicates that the public is becoming increasingly color conscious. The impetus that color photography will receive, now that Dufoy Leico Colorfilm and the miniature camera make photography possible in colors in many interesting fields that once were limited to black and white, will be all that is needed to make it exceedingly popular. So, make way for the candid color photograph!

Tips on Home Projection

(Continued from Page 117)

possible to project pictures around a corner. To "step up" the image, place the mirror equidistant from projector and screen and the size will be doubled.

Never throw away the block, unexposed strips of film which are cut out and set aside while editing. Splice 2-foot leaders and trailers into your reels to prevent unnecessary white glare on the screen after the reel has been projected.

Using red or black crayon, print the title of every 400-foot reel on the cover of each humidior can to identify the subject. Because crayon lettering is hardwearing yet easily removed, this has an advantage over waterproof ink or enamel point.

Lastly, here is a helpful "kink" which makes cleaning films a pleasure. Sew a 2-inch square of flannel or other soft, lintless cloth on the thumb and forefinger of an old left-handed glove. Moisten each pad with film cleaning solution and allow the film to pass lightly between these squares while the right hand turns the takeup reel. In this way, films can be cleaned quickly and efficiently. They will always be sparkling and clear.

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the formation of a new company including Mr. John A. Maurer, widely known as an authority in electronics and sound recording and reproduction. This organization will specialize in the type of precision work in the 16 and 35mm fields in which Mr. Berndt has pioneered and will shortly announce interesting developments in high quality 16mm recording. Eric M. Berndt takes pleasure in introducing

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sound-printing if sound and pictures are on two separate negatives, or one.

Secondly—and I think Bill will do this, for he has his heart set on getting a sound-camera—he could use the outfit, shooting whatever he could in sound, and the rest silent (by simply removing the batteries that power the sound-equipment), and making most of his sound-track later, as in my first suggestion. This, of course, would give him a chance to try recording the actual noises of his alluring lands, and making dialog-scenes of his friends. In this, I know he's going to learn a lot about microphone-placing. There is really quite a trick to getting a mike where it will give you a good record, and yet be either out of the picture, or unnoticed. Recording in the open, by the way, you can often hide the mike behind some bushes, or the like, right in the picture, yet give no suggestion that the thing is there. And, for good recording, you'll have to have the mike close to the people—about a yard (or less) from their mouths, as a rule. This, incidentally, suggests another reason why it is a good idea to make as much of your sound as is possible separately.

About at this point, Bill asked me how I expected him to record music for his sound-track. I reminded him that he has a phonograph—and it is quite easy to play any record he chooses to use in his score, with the microphone close to the phonograph's loudspeaker. The fact that the motor of a 16mm sound-camera will only run about 25 feet of film at a winding complicates this somewhat, but even so, it can be done. Here's another point to look out for: phonograph records aren't by any means all recorded at the same volume-level, so you'll have to be mighty careful to balance this up, or your accompaniment will be faint for a few scenes, and then suddenly blast forth like thunder.

Summing the whole matter up, if you're going to try sound-on-film pictures, you'll find that you have to prepare everything as carefully as though you were Cecil DeMille making a gigantic spectacle. You'll have to have the patience of Job in directing your actors. You'll have to have your technique—especially exposure—letter-perfect. You'll have to cut your picture with your camera. And most of all, you'll have to work like a horse! If this isn't too high a price to pay for the thrill of making your own sound-films, go to it: you'll have a big job on your hands—but you'll get pictures that won't need any apologies.

*Eastman D-9 developer:

Stock Solution A	
Water (about 125°F.)	16 oz.
Sodium Bisulphite	¾ oz.
Hydroquinone	¾ oz.
Potassium Bromide	¾ oz.
Cold water to make	32 oz.

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Sodium Hydroxide

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Use equal parts of A and B, and develop 2 to 2½ minutes at 68°F. Reversal film has a non-halation backing which can be removed by wiping with methyl alcohol.

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The Motion Picture CAMERA Magazine



VICTOR
MILNER, A.S.C.

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PRIVATE WORLDS

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Next Month

- There will be several interesting articles on some of the leading cameramen in the Hollywood studios. In these articles we will attempt to give you an insight into the methods used by these men to secure the type of photography for which they are famous.
- There will also be several articles of a technical nature contributed by members of the A.S.C.



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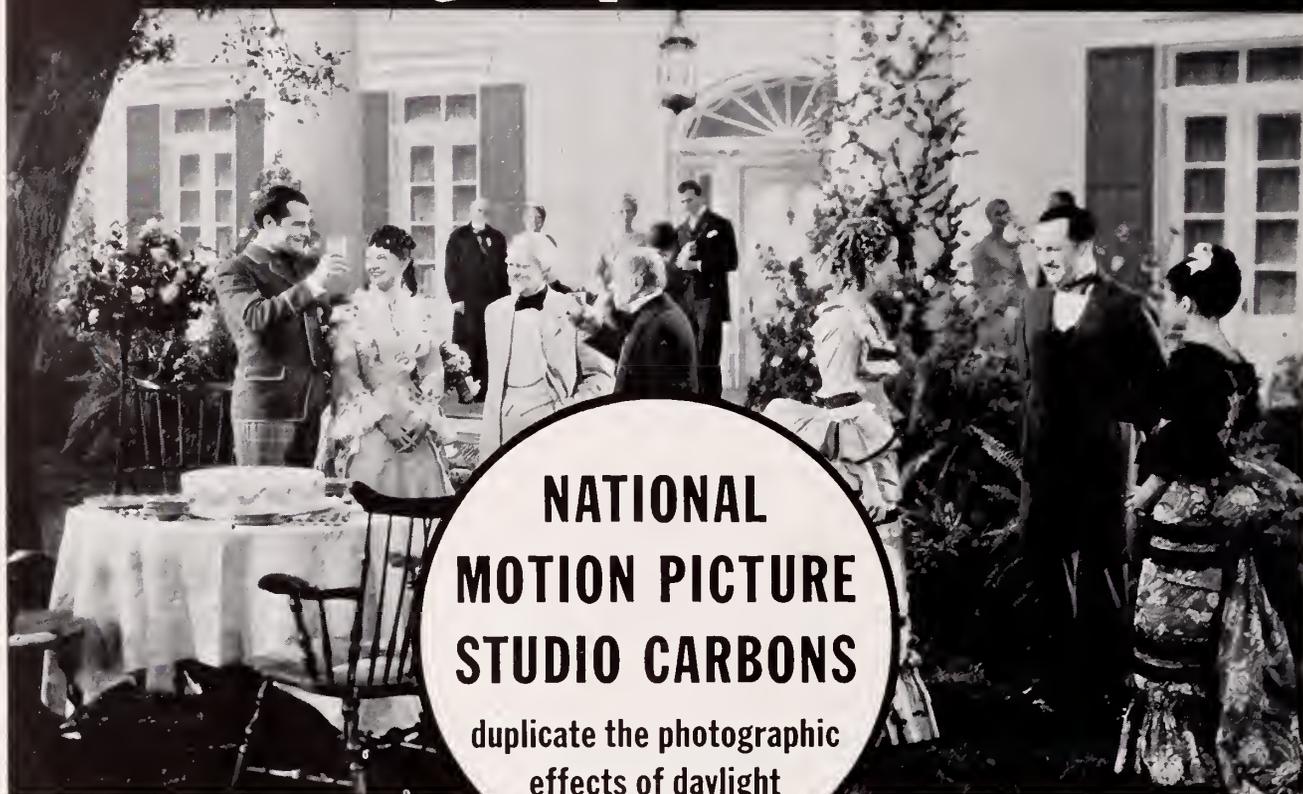
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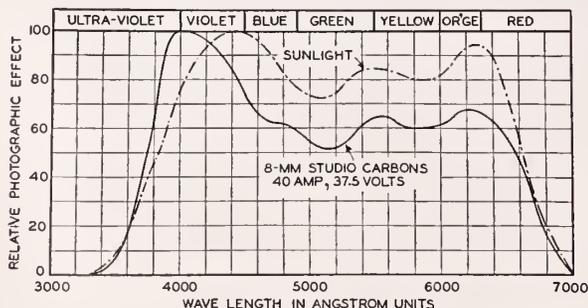
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SCORE

THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science. Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship. To this end its membership is composed of the outstanding cinematographers of the world with Associate and Honorary memberships bestowed upon those who, though not active cinematographers, are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science. To further these lofty aims and to fittingly chronicle the progress of cinematography, the Society's publication, *The American Cinematographer*, is dedicated.

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GIVEN a good tale to tell, the next thing is to tell it well cinematically. Many a good story, ably directed and photographed (in the narrow sense), fails to become a good play. Far, poorly conceived in "audience emotional reaction" flaw (the nervous intensity of the percipient not being smoothly sustained in a gradually mounting "trough and crest" undulation), the picture version fails to bring out all the native dramatic values possessed by the original story—is found wanting because of its lack of a rhythmic, inevitable "flow and ebb" of the life portrayed. And, only through complete integration of the story's subject-matter with "camera participation" and "cutting" can the ideal picture-audience result be realized; such as found, for example, in "Broadway Bill."

Cutting exerts a direct influence upon picture flow. This is proven by the simplest possible means: the expedient of short cuts in rapid succession (as opposed to long cuts in slow succession) seemingly hastens the cinematic movement (percipient experience), though in fact, it may or may not actually do so, depending on the nature of the subject-matter and the camera's interpretive efficiency in the particular instance. While in some cases fast cutting actually builds an accelerated emotional participation within the percipient, in other instances it simply repeats a cycle of non-progressive emotion. Thus the very existence of this sometimes false impression of hastened experience is one verification of: Cutting and camera-participation must be entirely harmonized and integrated with the picture's subject-matter to a conserved and unified, rising cumulation.

In enhancing a cumulative crescendo within the sequence, certain general cutting techniques have proven their merit through years of practical film making, such as: starting with a long shot, cutting to a medium shot, and then to closeups. In this most elementary of patterns there is one great validity, that of ascending intimacy.

Another conventional technique is the close scrutiny of a significant facial expression, or of some animate or inanimate symbolism, with the camera pulling away revealing the emphasized object relative to the dramatically consecutive context of characters and/or surroundings; followed by a series of medium inter-cuts, and finally spreading out to full-shot action for the curtain scene of the sequence.

Within the synthetic flow of cinematic movement there are several coordinated rhythms. We have just observed that one of these is camera scope (full shot) through to intimacy (close-up), or vice versa; in prolonged swells, or rapid-fire shuttling in and out, or their mixture as the case may be. Its purpose being identical with that of each of the several rhythms: to present clearly to the audience the deeper human relationships that exist and develop between story characters—so very essential to cogent storytelling. Far (it is impossible to emphasize the point too much) this rhythm of individual human life in its contacts with other life around it, must be experienced vitally by the theatregoer through the medium of the all-knowing cinematic eye and ear, if the picture story is to be fully successful.

Thus we remark the "follow shot," so abundantly used in intimately tracing characters or things from one place, person or situation to another place, person or situation; or far an unyielding, progressively closer, or broader, identification of the percipient with actor or symbol. Sometimes these shots are well done, delineating the true significance of the relationships concerned; and at other times as poorly executed, missing the keener dramatics of the conflict or sympathy between the characters or symbols; or worst of all, intruding only superficial connections.

The real cinematographic interpreting of these human

Rhythmic

activities is, in the final analysis, a skillful blend of cuts and mobile camera, achieving the fullest cinematic effectiveness by an entirely unself-conscious "participation" in the "central emotional strain" threading rhythmically through the story.

For example, as a bit of the synthetic whole picture, there is a shot in "The Barretts of Wimpole Street" depicting the unhappy relationship between despotic father and browbeaten children, which illustrates perfectly the much-to-be-desired and ideal "oneness" of "omniscient eye" and "rhythmic flow of emotional vibrations."

A series of cuts show the young people enjoying a palka done by Henrietta in Elizabeth's sitting room. The camera then joins Henrietta in her dance, following her about the room. As she sweeps widely in the direction of the hall door the camera, instead of swinging back with her toward the center of the room, cantines on irresponsibly and gayly toward the door and bumps abruptly into the scowling elder Barrett just entering the room and watching Henrietta as she palks and the others as they gleefully applaud her. Another series of cuts develops the denouement of the clash as the father explodes in his wrath.

In this follow shot the camera's movement is the actuating element which so vividly crystallizes for the percipient the dismal state of affairs between father and children. The camera has taken unto itself the children's stolen joy, participating with them in it through Henrietta's dancing, and has been caught unawares and checked up with frightening abruptness by the ever-threatening menace (the



Flow— Mental and Visual

by
A. Lindsley Lane, A.S.C.

"central emotional strain" in this case) that clouds the young folks' spirits. It is, in this instance, the most effective way of bringing together and superimposing the two opposing experiences of father and children into a pungent, dramatic whole experience for the theatregoer. Here the cumulative sweep of suspense and combat is compressed into the single (and therefore doubly vital) impress of the one panning shot. Contrary to the usual intensive effect of a moving camera, the camera movement in this scene



conserves and keys perfectly the startling intrusion of the aminorous Barrett. There is both "conservation" and "complication" here, as there should be in every properly conceived and executed mobile camera shot; otherwise, the use of the mobile camera is worse than meaningless, is in fact, destructive to the emotional rhythm of the cinematic flow.

Looking at another aspect of cinematic flow, as it pertains especially to the cinematographer. Physically rhythmic matter, such as figure exit and entrance timing and placing in the screen area, possesses much dramatic value; for there are always the screen-limits and their influencing pressures, immediately associated with the percipient's imaginative experiences. In this regard it will

be helpful to spend a moment on the two complementary physia-psychological stresses of: (1) actually visible screen movement; and (2) mentally visualized off-screen movement. Both of these flaws are a part of cinematic movement, each interacting with and augmenting the other in the picture-percipient experience.

There is a powerful dual psychological function residing constantly in the screen-limits, namely: "elimination" and "suggestion." It is the relative proportions of each of these, conditioned within the percipient's mind at the particular time, that denotes the nature of the shot on the screen. Either the shot is one of directionalized elimination; or it is one of evaling suggestion. (Note that there is an intrinsic rhythm in both of these processes). Either the shot is framed to eliminate irrelevant or distracting matter from the percipient's experience; or it is framed to suggest in his imagination certain idealizations or concentrations of meaningful contiguous influences or matter.

In the shot played primarily for all its own worth and for nothing else about its immediate concern, the picture is composed so as to be almost completely self-contained, not only in detail of contributive matter, but also in the formation of its psychological stresses. There will be no indicating stimuli of whatever sort pointing outside of the screened area, except as a most subordinate subconscious association of ideas.

But in the shot definitely played to suggest dramatic affinity with an off-screen experience or inter-cut shot, there is the change from a neutral function of the picture-limit as in the self-contained shot, to one of positive function. The picture edge then becomes a live element, due to its physical demarkation of the actually visible from the imagined visual. And this rhythmic element is the one so prevalently disregarded by picture makers.

I refer to the almost absolute practice of not allowing the eyes of a closeup head to look off the short side of the screen; or of a walking or running figure to advance toward the short side for a sustained time. This custom as an unvarying rule is without foundation in the motion picture and fails to take into account the cumulative unity of the picture sequence. Certain phases of cinematic composition may seem to contravene orthodox static composition and yet not do so psychologically, and are in fact, but the cinematic extension of the old accepted principles and among the most potent factors of cinematic rhythm.

As witness, in a shot of the evaling suggestion type, there are occasions when the stress generated within the percipient for the screen character, would have the character (profile figure) close to the screen edge with his back toward the screen center, so that the character could move backward unhindered, away from the nearest edge and away from the percipient-imagined scene directly in front of the character. Such stress is generated, for instance, when the screen character is fearfully, frozenly watching the advancing steps of a mortal enemy. The placement in this way of the figure on the screen greatly magnifies the dramatic impetus by impelling tangibility and graphicness in the imagined section of the conflict.

The advancing enemy in the inter-cut shot is framed in a like manner. He is moving to the closer edge of the screen; thus the wider space in back of him suggests his imminence to the stricken prey, with the resultant energy developed within the percipient striving to hold and pull back the advancement. This particular cinematic composition rhythm is especially effective when audience sympathy is with the fearful one. In other instances, with the reversal of audience sympathy to the advancing character, there would be the dramatic need of re-stressing the characters on the screen.

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John Livadary, Winner of the Academy of Motion Picture Arts and Sciences 1934 Award for Sound in the Picture "One Night of Love."

Recording "One Night of Love"

by

John Livadary

Chief of Sound Department, Columbia Studio.

IT WAS early determined that the musical sequences of "One Night of Love" could most advantageously be made by recording the sound under conditions as nearly ideal (acoustically and psychologically) as might be possible, thereafter taking care of the release-print sound problems by re-recording. This would enable us to utilize the fullest range obtainable in the original recording, later compressing it, in the re-recording process, to a range within the reproductive capabilities of the average theatre's equipment. In consequence, it would clearly be wise to make the original recording by whatever means might be found to give a record of the greatest volume range and tonal fidelity.

After a survey of recording practice and equipment, it

was determined that the so-called "hill and dale" method of recording on wax discs offered the greatest possibilities, though it had not previously seemed applicable to motion picture use, and it was accordingly adopted. The "hill and dale" method is basically a revival of Edison's original method of recording sound by means of a stylus which cuts a groove of varying depth in a soft material; but recent developments, not only in microphones, recording channels, and the like, but in the materials of both the original wax and the final, pressed disc, and in the methods of plating and stamping the discs, have improved it to a point where it is in no way comparable to previous conceptions of disc recording. In conventional records—including those used for talking picture, broadcast and phonograph purposes—the needle travels laterally in the groove, tracing a wavy line between the walls of the groove. This method has several disadvantages, not the least of which is the fact that a sudden peak of volume tends to make the recording stylus over-modulate, cutting through into the adjoining groove and spoiling the record, or at least leaving the groove-wall dangerously thin, so that only a small amount of wear is necessary before the groove breaks down, unfitting the disc for further use. In the "hill and dale" method, however, since both stylus and needle move vertically, this hazard is avoided, and the recordable volume range increases from about 25 or 30 db to 40 or 50 db. In addition, much more faithful reproduction is possible as a result of flatter frequency characteristics and less non-linear distortion in the recording and reproducing channels, and objectionable "surface noise" is almost entirely eliminated.

In recording the musical sequences, records were made simultaneously on film (with the regular "wide-range" recording) and on the vertical-cut disc; the latter was found definitely superior, and was used exclusively in producing the final release version.

There was an interesting problem in microphone placement in the making of these sequences, for the singer's artistic caprices precluded the logical practice of pre-scoring the accompaniment, and recording the solo to a playback. Therefore, the soloist had to be recorded with a 70-piece symphony orchestra and a large chorus at a single "take," with the added complication of being forced to work in a large sound-stage, which was much too "dead," from a reverberation standpoint, to be satisfactory acoustically. The problem was solved by the use of multiple microphones: two dynamic mikes for the orchestral pick-up, one about 30 feet from the orchestra, and the other, fitted with a variable, high-pass filter, about 90 feet away, to introduce a sort of synthetic reverberation into the record. Miss Moore desired an unusually close association with the orchestra, so her voice was recorded with a special directional microphone, placed directly in front of her, but at right angles to most of the orchestra, thus utilizing the marked directional qualities of this type of microphone. A fourth microphone recorded the chorus.

The recording wax, in sharp contrast to the heavy waxes previously used in disc recording, consisted of only a very thin layer of wax flowed onto a metal supporting-surface. This method permits a much finer and more homogeneous surface-texture than is possible with earlier methods. In order to take full advantage of this ultra-smooth surface, the recording-head does not use the conventional sapphire-ball bearing or support in front of the cutting tool, but utilizes a minute stream of compressed

Continued on Page 152

Academy Award Won By Victor Milner, A.S.C.

VICTOR Milner, First Vice-President of the American Society of Cinematographers, has been acclaimed by the Motion Picture Industry the outstanding camera-artist of 1934, receiving the Cinematography Award of the Academy of Motion Picture Arts and Sciences for his achievement in photographing "Cleopatra." In a year in which all of the other major awards have been subject to criticism, Milner's stands out as the one meriting widespread popular approval. Moreover, both the nomination of the finalists and the selection of Milner as the ultimate winner concur with both popular sentiment within the Industry and the experienced judgment of the camera profession.

In the opinion of his fellow-cinematographers, Milner has for many years been esteemed one of the greatest exponents of camera artistry, but the nature of most of his recent productions, together with the very skill which, while bringing him the acclaim of his fellows, invariably held photography as subservient to the interests of the production, withheld from him the opportunity for so spectacular a display of artistry as meets public acclaim. In "Cleopatra," however, Milner was offered unusual opportunities for the spectacular, and he took full advantage of them without for a moment diverging even slightly from his established precedents of photographic taste.

In many respects, "Cleopatra" revealed Milner in a new mood. The many productions he has made with Ernst Lubitsch have been characterized by a peculiarly brittle brilliance which, while harmonizing perfectly with the Lubitsch directorial style, deliberately avoided any self-assertion on the part of the camera. Some of his other productions, like "The Way of All Flesh" and "Song of Songs," reveal a sombre, almost Slavic, melancholy, rising to great pictorial heights. Another of his earlier films, "The Wanderer" (made several years before the Academy came into being), revealed him as a master of exquisite pictorialism reminiscent of Corot and other great masters. In none of his previous work, however, has he in any way paralleled the mood revealed in "Cleopatra." The keynote of his treatment of this production was unrestrained, yet sophisticated, luxury, carried to a point which makes the overworked adjective "gorgeous" the only fitting description.

In any production of DeMillian magnitude, especially one utilizing spectacular and richly atmospheric costumes and settings, striking compositions are to be expected. Equally to be expected in any production photographed by an artist of Milner's eminence is flawless treatment of the protagonists. But in "Cleopatra," Milner makes his cam-



Victor
Milner,
A.S.C.

era play an arresting role in the subjective presentation of the story: he motivates every scene with photography which embodies the lavish sensuality of ancient Egypt and the patrician depravity of Caesarean Rome perfectly objectified.

Careful analysis reveals that this effect is in a great measure due to Milner's mastery of the Art of lighting. Not only has he painted his compositions with light and shade and sculptured his players, but, with surpassing skill, he has wielded light, as with the most delicate of brush-strokes, to enhance the textural values of the sumptuous settings and costumes. Not for nothing have his fellows acclaimed him as one of the great masters of lighting! In "Cleopatra," his sheer mastery of light makes the sensual richness of the scenes something which can almost be felt physically.

Milner's approach to his work reveals him as not only a great artist, but a craftsman of painstaking accuracy. No detail is too small to merit careful attention, nor is any physical or mental effort too great. To even the most unpromising "program picture," he brings superbly finished photography, and a vital enthusiasm. In sharp contrast to his scrupulous workmanship, the man himself is vibrant with nervous energy, which he lavishes almost prodigally upon his work.

He places paramount stress upon the creation of dramatic moods with lighting; in his estimation it is not enough that a scene be an intrinsically beautiful bit of photographic pictorialism: Cinematography is essentially a vehicle for dramatic expression, and every phase of the photography should exist for the specific purpose of telling the scene's story. To him, it is the Cinematographer's duty to make every scene a gripping emotional experience, perfectly attuned to the dramatic mood of the action.



George
Folsey,
A.S.C.

Interpretative Photography Wins Folsey Academy Nomination

by
James L. Fritz

Formerly drama editor, St. Louis Post-Dispatch
and N. Y. Daily Mirror.

GEORGE Folsey, one of this year's nominees for the Academy of Motion Picture Arts and Sciences award, was undoubtedly given this honor on his interpretative photographic ability.

Although Folsey is best known for his talent to inject the illusion of brilliance into his work, "Operator 13," the production which won him the consideration of the Academy, possessed none of this quality. In this picture the subject, Miss Davies, required a romantic and softening treatment, instead of the sophisticated aspect with which this star is usually cloaked. It was for this excellent handling, on the part of the cinematographer, of the subject in an entirely different atmosphere that closed him among the three outstanding cinematographers of the year.

On the other hand, Folsey's ability to inject sparkling and vitolic brilliance into a production was displayed to an advantage in a previous picture, also starring Miss Davies, "Going Hollywood." After viewing these two productions one can readily realize the versatility necessary on the part of the ace cinematographer. It is hard to say which of the two is the best example of Folsey's work. However, in the latter production the true quality of brilliance, with which Folsey is always identified and for which he seems to strive in most instances, makes itself strikingly noticed.

Folsey exploited his ability to inject this brilliance into his pictures, by telling us that when the cinematographer is striving for brilliance, he must create a color or tone that is directly opposite to another color or tone. This effect is obtained by the correct blending of lights and shadows. To give the subject this treatment, the cinematographer must have, at all times, the feel of the mood of the subject.

To understand the mood of the subject, the cinematographer must also have the absolute understanding of the mood of the story. He must obtain this understanding of the moods of the story and subject, so that he will be able to light and surround the subject with a background coinciding with these moods. The background should never be allowed to become more important than the subject, and yet, it should never be allowed to reach such a degree of unimportance, that it no longer has any relation to the subject. To obtain this perfect relationship between subject and background, Folsey never allows his background to become monotone, but instead, he always introduces a contrast in shadows that will blend this relationship with perfect harmony.

Shadows are the cinematographer's best friend. With them he is not only able to increase or decrease the quality of his composition, and display the subject to a greater advantage, but, with them, he can attune the audience's mind to any mood he desires, and key the response to any emotional point or pitch. If the cinematographer keeps an attentive eye on the handling of shadows, he can prepare the audience for any desired dramatic tempo. He can also create a subconscious, emotional receptiveness on the part of the audience that greatly enhances the dramatic, vitolic, and entertainment quality of the production.

So that he is able to have this understanding of the proper manipulation of lights and shadows, Folsey particularly takes notice of the shadow effects caused by natural elements. Working down the street in the rain, he studies the fantastic shadows that the street lights throw grotesquely on the wet, glistening pavements. The church steeple when it is cloaked in a dense fog gives him the illusion of mystery and weirdness, which surrounds the majestic structure, while again climatic conditions created those friends of the cinematographer—shadows.

Every cinematographer, Folsey believes, when studying shadows and their effects, should give extensive thought as to where the light comes from. It is true that the illusions and effects of brilliance, vitolity, luxuriousness, and mystery which the cinematographer of today strives to inject into his work, are less difficult to obtain than they were six or seven years ago. This is due to the fact that today the cinematographer is working with a much foster film, therefore making possible a minimum of illumination.

Folsey also tells us that to do justice to the subject and story the cinematographer should have a personal and sound acquaintance with the situation he is photographing.

Continued on Page 151

Audience Must Believe— is Charles Rosher's Creed

by
Harry Burdick

WHEN Charles Rosher was awarded the cinematographic assignment of "The Affairs of Cellini," he accepted with more than the ordinary degree of enthusiasm. The locale of the story is Florence, Italy. Rosher had spent several months in that historic city a few years back and had come to know it well. He determined to recapture on celluloid the life and charm of the gay community. How well he succeeded is indicated by the picture's nomination as one of the three outstanding examples of the past year's cinematographic achievements.

At the start, as his camera began functioning, there was no inkling in Rosher's mind that here might be a cinematographic masterpiece in the making. It was a costume picture with interesting scenes, yes; but not a spectacular extravaganza overflowing with optical opportunities. More, the tight thirty-day shooting schedule afforded little time for extensive experimentation. Actually, it was galloped through to completion in twenty-four days.

It was, therefore, far from being a "natural" for high cinematographic honors. It was the sheer artistry and genius of Rosher's camera eye, working in routine manner and under driving pressure, that elevated the picture from an ordinary level which circumstances might have dictated to its ultimate cinematographic heights.

In fine, Rosher took the materials of "just another picture" and molded a photographic gem. One can easily discern in the achievement a striking illustration of the adage relating to making the most of the opportunities at hand.

Rosher is inherently an artist. You see it revealed in his charming ranch home, in his flower gardens, and in all his photography.

He has been utilizing camera lenses as vehicles of expression, for portrait and cinema halls, some thirty-add years. And these years have made definite influence on the trend of Rosher's pictorial interpretations.

Basically, the camera is an instrument of reproductive fidelity. It has conveyed to Rosher a passion for cinematographic realism. He is very much the fundamentalist, the realist.

His pictures all contain a definite and appealing photographic charm. But underlying is his never-ceasing quest for realism. Not the stark, raw realism of the man-killer. Rather, he wants more than anything else to make his characters on the screen to appear real and believable—to be genuine human beings of living flesh and blood instead of figures released from book pages.



Charles Rosher, A.S.C., whose photography in "Affairs of Cellini" won him nomination for Academy Award.

To this end, he advises against makeup so far as is possible. In the Cellini work, Constance Bennett wore only ordinary street makeup. Unless rigidly censored, he avers, makeup gives the actor or actress a false and unreal appearance that is at once labeled in the audience mind as being of the theater. He heartily dislikes faces made into bland masks, lips that reflect a varnish pail.

He likes to transmit to the screen the little individual imperfections that establish character in a face; delicate traceries of the skin, throbbing linings of veins, even a mite of blemish or honest wrinkle. For of such things are living faces actually made. He likes to capture them with his camera.

He holds definite antipathy for scenes that seem purposely posed, for unnatural groupings and artificial actions that cry loudly of theatrical origin. So long as the audience sits before the unwinding of his picture, Rosher wants that audience to believe what it sees without qualification. Above all, he wants it to feel and believe it is looking at real people and real scenes.

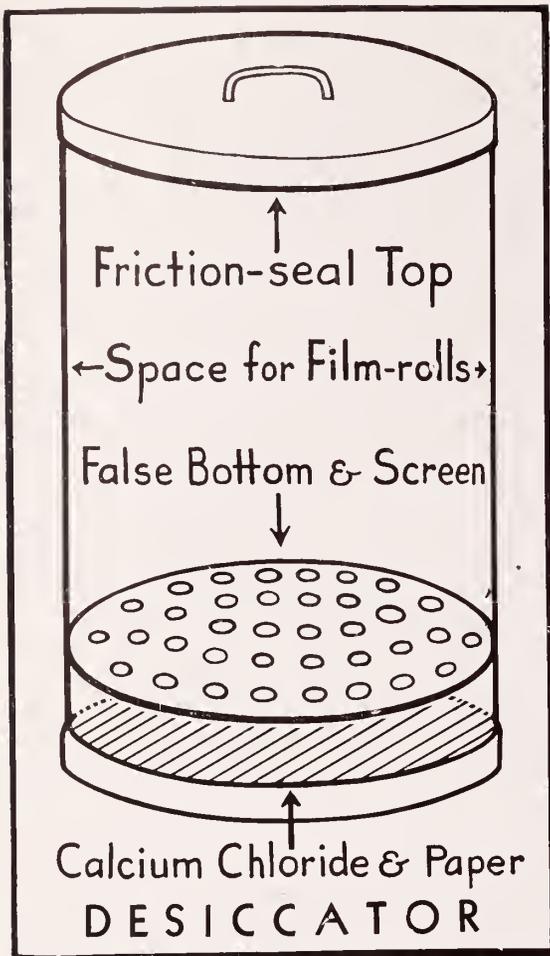
And so he devotes all the wizardry of his cinematographic arts to portraying a fidelity to actuality, a believable realness. Even an incidental brailed steak in a cafe scene, as instance, must be presented to seem hot, sizzling, appetizing, good enough to eat.

He likes clear pictures. He doesn't go in for diffusing and other so-termed arty effects gained by mechanical means, although he has made them when conditions required. They may be photographically beautiful, gorgeous even, to look upon; but they aren't real.

Not that there is any touch of monotone to Rosher's work. The Cellini picture is fair instance.

The famed goldsmith and freebooter of the sixteenth century lived in a gay era, a prosperous and colorful period. Palaces were alight with splendor and glitter. Fine ladies were resplendent with jewels and full skirts of fine goods. So Rosher photographed banquet and palace scenes

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Cinematography in the Tropics

by
Philip M. Chancellor, A.S.C., F.R.G.S.

Leader, Chancellor-Stuart-Field Museum Expeditions
As told to Wm. Stull

THE requirements of Expeditionary Cinematography find no analogy in the fields of production, newsreel or commercial camerawork. In these fields, artistic and technical matters are the principal concern of the Cinematographer, and he needs to concern himself only slightly with the selection and nature of his subject-matter. The Expedition-Cinematographer, on the other hand, must usually determine the subject-matter of his scenes, as well as their purely cinematographic treatment. He is generally the only person in the party who has any knowledge or appreciation of the factors that make a successful motion picture, and he must therefore bend every effort to the end

that he may bring back a complete and useful production. Not only must he supervise, direct, and photograph the picture, but he must often cut and title the finished film as well, in some cases having to prepare several versions, for educational, reference, and general exhibition purposes.

It is therefore distressing that the cinematographic records of so many expeditions have been entrusted to unqualified workers. In many instances the photographic work has been delegated to members of the party who, while specialists in their own scientific fields, have but a casual acquaintance with cinematography; and in some instances, this important work has even been left in the hands of out-and-out amateurs. In view of the acknowledged educational and economic value of expedition films, it should always be remembered that the success of the films depends entirely upon the training, skill and adaptability of the Cinematographer who makes them.

The matters of equipment and photographic procedure are susceptible of almost infinite variation. The budget available for photographic expenses must naturally govern the matter of equipment: in general, one should always get the best and most dependable apparatus one can afford. The use of substandard (16mm, 17.5mm, etc.) equipment may offer some economies, but to my mind, it also presents disadvantages which more than offset the potential savings. If I were equipping an expedition with a limited budget, I would prefer to use hand-type standard cameras, such as the DeVry, rather than using either substandard equipment or obsolescent standard cameras.

Wherever possible, a studio-type camera such as the Bell and Howell or Mitchell camera should form the backbone of an expedition's equipment. Such cameras are imperative for scientifically precise work. For certain types of work, such as fast-moving wild-animal studies, the Akeley is, as always, supreme. But no expedition should start without at least two hand-type cameras such as the DeVry or Eyemo. These are absolutely invaluable, and will probably do a lion's share of work in the field.

Fast lenses are always an advantage, though by no means indispensable. It is important, however, when working in the tropics, to equip with lenses such as the Carl Zeiss or Cooke types, which will not be affected by the extreme heat and humidity. For the same reason, tripods (especially those for the hand-cameras), carrying-cases, and all accessories, should be of design and materials which will resist all climatic conditions.

For the same reason, filters mounted in glass are seldom advisable. I have used some glass-mounted filters which withstood tropical weather very well; but the majority deteriorate very quickly. I therefore invariably carry several duplicate sets of gelatin filters, each in an individual, weatherproof container, so that I am always assured of perfect filters in an emergency.

The choice of filters is always an individual matter. As a rule, the Expedition Cinematographer will not need so extensive an assortment as the studio worker requires. The principal uses of filters in most expeditionary work will be controlling extremes of light-contrast, and penetrating atmospheric haze in long-shots. In some instances, special color-correction may be important for scientific and pictorial reasons, but as a rule over-correction should be avoided; and I personally feel it unwise to attempt to lighten the rendition of flesh tones in shots of dark-skinned natives by using filters, though this can easily be done by using the "G" filter.

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TELEPHOTO SHOTS

"As If It Matters"

● JOE AUGUST of Columbia "moom pitchers" studio, has a phoney hobby . . . he saves phoney-graph records. . . . Strange as it may seem, the hobby has proven quite profitable to Joe, he rents out some of the older ones for dubbing purposes. . . . And as long as we're on the subject of hobbies we might as well mention ARCHIE STOUT who is that way about yachts. He owns a little skiff which set him back just 25 Gs. . . . Where did I hear that remark about crank turners and bulb squeezers never getting what they're worth? . . . And then there's CHARLIE CLARKE who saves neck ties . . . what neckst . . .

"It Might Have Been Gable"

● We can't figure out whether CLYDE DE VINNA has a hobby or an obsession. It seems that Clyde is trying to start another league of nations in his home. Everyone knows that Clyde is one of Hollywood's unsung humanitarians. He adopts children from every corner of the world. After fifteen years of traveling he has collected to date . . . Antonina and Leonne, two Polynesian girls . . . Clarence Kumalae, an Hawaiian lad . . . Ryovo Matsiu . . . a son of the land of the Cherry Blossoms . . . and Clyde is again leaving for foreign ports shortly to start shooting the new M.G.M. flicker, TYPEE . . . no telling what he will bring back this time . . . maybe a two-headed yak. . . . Clyde called his house the other mid-night to tell his "flutter half" that he was again on the road to Mandalay. One of the acquired offspring answered the phone and Clyde said:

"Let me speak to Mama, this is Daddy."
 "Who?" asked the voice on the other end.
 "Daddy," Clyde again informed.
 "Who???"
 This time Clyde was utterly exasperated.
 "The man whose picture's on the piono!" he yelled.

"Here's One For The F.R.R.C.A."

● And while we're on the trail of the Ripleys pulled by the leading Cinematamakers there's the one by the Barnes-Blondell merger.

It seems that the L.M.&B.B. Railroad, a brand new venture in electrified transportation, has been organized in H'wd. The entire right-of-way is located under the Barnes-Blondell El Rancherio. The house straddles the sharp ridge of the H'wd. mountains and the unfinished basement offers an interesting terrain for the project and provides many involved engineering and construction problems for "de ole massa Barnes."

The choo-choo's initials (with apologies to F.D.R.) if you haven't already guessed, my dear readers (are we beginning to sound like a Fan Mag?), is the LOOKOUT MOUNTAIN & BARNES-BLONDELL RAILROAD. . . .

The whole affair is being built for Narman Scott Barnes, age 3 months and 11 days (tie that one Mr. Ripley). The first train is being constructed by a young man in the film capital who specializes in making such toys for devout and doting parents. It consists of an electric locomotive, four feet long, and a train of cars in praportion . . . and when completed it will cost 70,000 (that's cash, not but-tons).

"Oil Right Tony"

● And when we hear of dizzy things we always think of TONY GAUDIO (by the way, he took the writer to lunch the other day, so we owe him this plug?) who is shooting the blinky, "OIL FOR THE LAMPS OF CHINA." Tony, it seems, has a bad cold, which he contracted when the company was on location at Lone Pine, near Mt. Whitney. Tony, all the time the location was in the desert, was trying to cure his cold in the old-fashioned manner. When they arrived back at the "stoogio" the boys had erected a mound with a head stone reading:

TONY GAUDIO
 ONE SHOT TOO MANY
 R.I.P.

Which this department considers a nifty. . . .

(I had to get that nifty line in so that I could tell about SOL POLITO. . . .)

"Gum Up an' See Me"

● While Sol was shooting "GO INTO YOUR DANCE," the latest Jolson-Keeler revuesical, he was always having trouble with the charmings' gum-chewing activities. Finally in a fit of temper Sol tore his hair.

"If you gals must chew gum," he screamed, "why the hell can't you chew it in time with the music?"

"One Happy Family"

● Then there's the nifty which Geo. Stevens pulled on Harold Wenstrom last "some day" over at the R.K.O. plot. "Wennie," quoth the director, "do you know—think—

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A scene from "Oil for the Lamps of China." Tony Gaudio, Director of Photography; Operative Cameraman, Carl Guthrie; Assistant, Stuart Higgins, and Chief Electrician, Vic Johnson.



PHOTOGRAPHY

of the MONTH

"FOLIES BERGERE" (United Artists)

Barney McGill, A.S.C.: Directing Cinematographer
Daily Variety (February 16, 1935): "Photography and production are above average."

Hollywood Reporter (February 16, 1935): "McGill's photography of these numbers is nothing short of stunning."

Motion Picture Daily (February 18, 1935): "Photography fair."

Film Daily (February 20, 1935): Photography "Best."

"LET'S LIVE TONIGHT" (Columbia)

Joseph Walker, A.S.C.: Directing Cinematographer
Hollywood Reporter (February 16, 1935): "Lilian Harvey has been beautifully photographed"—.

"NAUGHTY MARIETTA" (M-G-M)

William Daniels, A.S.C.: Directing Cinematographer
Daily Variety (February 18, 1935): "Photography of William Daniels is superb."

Hollywood Reporter (February 18, 1935): "William Daniels' photography does much to enhance the beauty of the production."

Film Daily (February 20, 1935): Photography "A-1."

Motion Picture Daily (February 19, 1935): "William Daniels' photography enriches the production with consistent beauty both indoors and outdoors."

"A DOG OF FLANDERS" (Radio)

J. Roy Hunt, A.S.C.: Directing Cinematographer
Daily Variety (February 18, 1935): "Photography by J. Roy Hunt is very good."

Hollywood Reporter (February 18, 1935): "—and J. Roy Hunt's photography is up to his customary high standard."

"MISSISSIPPI" (Paramount)

Charles Lang, A.S.C.: Directing Cinematographer
Hollywood Reporter (February 21, 1935): "Charles Lang's photography is superb with several outstanding shots."
Daily Variety (February 21, 1935): "Photography is good."

"WEST POINT OF THE AIR" (M-G-M)

Clyde DeVinna, A.S.C.: Directing Cinematographer
Charles A. Marshall, A.S.C., and Elmer Dyer, A.S.C.: Aerial Photographers

Hollywood Reporter (February 21, 1935): "Photography by Clyde DeVinna, Charles Marshall and Elmer Dyer, and production are first-class throughout."

Daily Variety (February 21, 1935): "Best part of the air stuff is the beautiful photography, and camera work all through is noteworthy. Much time undoubtedly was spent getting gorgeous cloud effects and backgrounds."

"IT HAPPENED IN N. Y." (Universal)

George Robinson, A.S.C.: Directing Cinematographer
Daily Variety (February 21, 1935): "Photography is oke."

"LOVE IN BLOOM" (Paramount)

Leo Tover, A.S.C.: Directing Cinematographer
Hollywood Reporter (February 26, 1935): "Tover's photography is one of the better things about the picture."

"LADDIE" (RKO)

Harold Wenstrom, A.S.C.: Directing Cinematographer
Hollywood Reporter (February 25, 1935): "Harold Wenstrom's photography and the production's values are okay."

Daily Variety (February 25, 1935): "Harold Wenstrom scores with the camera, especially in preserving the idyllic nature of the farm scenes."

Motion Picture Daily (February 26, 1935): "Harold Wenstrom's photography is superb."

"GREAT GOD GOLD" (Monogram)

Milton Krasner, A.S.C.: Directing Cinematographer
Daily Variety (February 27, 1935): "Milton Krasner adds plenty merit with his camera."

Hollywood Reporter (February 27, 1935): "Photography and production values are good."

"McFADDEN'S FLATS" (Paramount)

Ben Reynolds, A.S.C.: Directing Cinematographer
Hollywood Reporter (February 27, 1935): "—and the photography by Reynolds is fine."

Daily Variety (February 27, 1935): "Photography is good."

"LIVING ON VELVET" (Warners)

Sid Hickox, A.S.C.: Directing Cinematographer
Hollywood Reporter (March 2, 1935): "The Hickox photography is excellent with some nice air shots."

Daily Variety (March 2, 1935): "—and nicely photographed."

"PRIVATE WORLDS" (Paramount)

Leon Shamroy, A.S.C.: Directing Cinematographer
Hollywood Reporter (March 5, 1935): "Not to forget Leon Shamroy's photography, particularly the Arab's death-bed scene and Joan Bennett's mental collapse episode."
Daily Variety (March 5, 1935): "Leon Shamroy has photographed exceedingly well, especially eerie effects suggesting mental disturbances of principals and patients."

"WHILE THE PATIENT SLEPT" (Warner Bros.)

Arthur Edeson, A.S.C.: Directing Cinematographer
Daily Variety (March 8, 1935): "Camera has been well handled by Arthur Edeson."

Hollywood Reporter (March 8, 1935): "Edeson's photography is by far the best thing about the picture and it is excellent." "PHOTOGRAPHY ALONE POSSESSES MERIT."

"TRAVELING SALESLADY" (Warner Bros.)

George Barnes, A.S.C.: Directing Cinematographer
Hollywood Reporter (March 8, 1935): "George Barnes' photography is more important than the picture."

Cameramen's INSPIRATION

CAMERAMEN long ago decided that Eastman Super Sensitive "Pan" is fit company on any flight of genius. And results vindicate their judgment. For four years in succession the great bulk of the really inspired motion pictures have been photographed on this superlative film. Eastman Kodak Company, Rochester, N.Y. (J. L. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN *Super Sensitive*
Panchromatic Negative



New Sound Editing Device

● A recent addition to the line of laboratory and sound equipment manufactured by the Hollywood Motion Picture Equipment Co. Ltd. is the Soundola used in the cutting of sound track.

The construction of the machine is very simple; it consists of a pair of re-winds, an amplifier hung from the wall in the illustration on this page and the reproducing unit placed between the re-winds. It is manufactured by this company for both 35mm and 16mm film.

It is claimed the machine has simplified the job of removing words or even stumbled syllables in the middle of sentences. Another claim made for it by the manufacturers is that motor noises on sound track such as camera noise, door squeaks, paper rustling, etc., are instantly detected.

The amplifier is A.C. operated, even to the photo-cell and exciter lamp supply and has incorporated in its circuit a cut-off filter to eliminate hum picked up from this source. Volume is controlled by the gain of the amplifier with an additional control to adjust the photo-cell voltage to local line conditions.

The amplifier has five tubes, transformer coupled. It is housed in a wood cabinet such as is used for the better grade midget radios. It is said to have sufficient gain to dominate a room from even a dense print or weak negative.

The reproducing block unit contains the exciter lamp, the optical slit, and the photo-cell. It is connected to the amplifier by a plug-in flexible shielded cable. This unit is made of heavy brass and is equipped with rubber feet so when it is placed in position between the re-winds it will not slide. The guide rollers are of highly polished duralumin and are cut away in the center so as not to

touch the sound track or picture area. The slit block or shoe is also relieved to clear the film between the sprocket holes. The scanning slit is an optical one in glass and is so constructed that it is impossible to touch the film or become clogged with dirt. There is also an inspection part illuminating a section of the sound track so that marking the film is facilitated without removing the film from the block.

National Blimp

● By now the news of motion pictures being taken during the Hauptmann trial contrary to the judge's rulings is news that has been passed on to the whole country, but just how this feat was accomplished was not exposed.

State troopers were stationed next to the cameras in the court room so that the court might be sure pictures were not being taken during the progress of the trial. In spite of this precaution the Universal News secured pictures which were made possible by the sound-proof construction of the National blimp built especially for this occasion.

By pre-arranged signals, the sound man was able to record the sound track while the camera was operating by remote control, the camera man having previously focused and set his camera. During the actual shooting he appeared to be a disinterested spectator, sitting approximately 15 feet from the camera that he was operating.

It is also claimed that the fast lens plus the new fast Eastman Special X film was responsible for the securing of the good photography in these interior pictures.

This special blimp, designed and built by the National Cine Laboratory for

recording the pictures and testimony at the Hauptmann trial for Universal Newsreel, was intended only for temporary use as the time allowance of approximately 10 hours did not permit the standard type construction.

It was made of 8-ply veneer paneling with a triple layer of acoustical felt lining the entire case. The clear plate glass window through which the lenses photographed was approximately 6"x8" in area and ground perfectly flat on both sides to prevent distortion.

The camera was mounted on an aluminum plate 1/4" thick which was cemented to a gum rubber pad. The rubber pad was in turn cemented to a second base plate secured mechanically to the base of the blimp. The camera was thus held securely although actually floating on the rubber pad which prevented mechanical vibrations from being transmitted to the tripod and floor.

One entire side hinged from the top to allow the 1000-foot film boxes to be interchanged and the camera threaded. The lower section of the rear hinged upward to permit the cameraman to accurately focus the lenses and determine the photographic field. A small opening in this rear door permitted the extension of the motor and recorder cables.

This blimp was absolutely sound proof and using a Standard Schneider Xenon 4" F1.8 lens the Universal News cameramen were able to obtain these remarkable pictures without any lighting equipment and without anyone in the entire courtroom knowing that pictures were being made.

S.M.P.E. Creates Honor Medal

● The Society of Motion Picture Engineers has created an award known as the Progress Medal. It is to be presented this year to an individual in recognition of any outstanding invention, research or development which in the opinion of the Progress Award Committee shall have resulted in a significant advance in the development of motion picture technology.

The Progress Award Committee has been appointed by the Board of Governors of the Society and is composed of Dr. A. N. Goldsmith, Chairman; M. C. Batsel, James Crabtree, Carl Dreher and W. B. Rayton. The Committee will meet on June 27 to select the recipient of the medal to be awarded at the Fall Convention of the Society.

The design of the medal has been submitted and approved by the Board of Governors and is the work of Alexander Murray of Rochester, New York.

WHITE LIGHT

from

"INKIES"

"IMPRACTICAL" was what they used to say of white light from inkies. Too much light was lost when the light was filtered to blend with daylight.

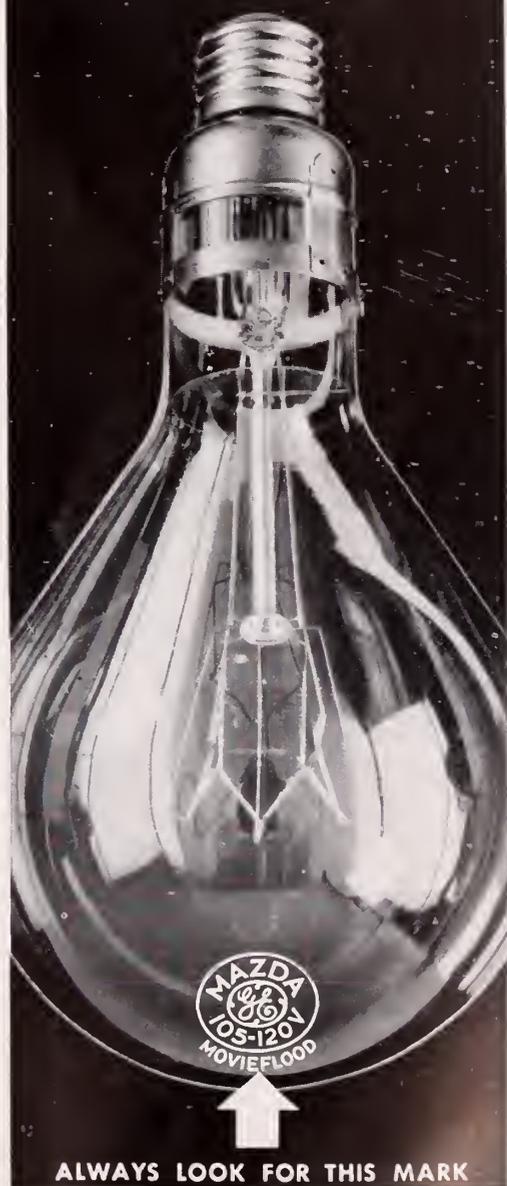
Recently white light from inkies has been made commercially practicable . . . through the use of the G-E MAZDA Movieflood lamp in conjunction with a newly developed glass filter. This provides a light having substantially equal quantities of the three primaries . . . red, green and blue.

This light works perfectly with color cameras and enables the color cameraman to swing from outdoor shots to indoor scenes and back again without bothering about filters. It can also be used very satisfactorily to blend with daylight indoors or outdoors.

Although this combination was developed chiefly for color work, it offers advantages to all cinematographers. It provides controlled daylight for the eye of the camera. It is helpful in process photography. It is useful wherever white light is desirable.

More important than this news is the point it brings out: General Electric makes lamps for every application. Are you benefitting fully from this versatility of General Electric MAZDA lamps? General Electric Company, Nela Park, Cleveland, Ohio.

GENERAL  ELECTRIC
MAZDA LAMPS



ALWAYS LOOK FOR THIS MARK

CINEMATOGRAPHY IN THE TROPICS

Continued from Page 144

In some instances, a supply of Orthochromatic stock can be advantageous, especially in extreme long-shots in the tropics where modern super-panchromatic emulsions tend to reveal a blur due to photographing the reflected heat-rays.

Whatever type of film packing may be used, it is wise to keep the weight of the individual units below fifty pounds (preferably about 25 pounds each), as much of the transport in the fields will probably depend on man-power. Two-hundred-foot rolls are the most practical, as the shorter lengths avoid the necessity for exposing an undue amount of film to the atmosphere at any time.

The matter of exposure is vital. In the tropics there is usually a tremendous difference between the photographic values of areas in direct sunlight and in shade: there is often almost no appreciable actinic reflection from shadowed areas. Unless one is thoroughly accustomed to using a dependable exposure-meter, the only reliable guide to exposure is absolute reliance upon frequent tests. My own experience is to carry a small developing tank—the miniature-camera tanks, such as the "Reelo," are excellent for this—and a changing-bag, and to make a test immediately after each change of set-up.

After exposure, the film should be desiccated as thoroughly as possible, re-packed in thoroughly dry paper, and re-sealed in its can, which has also been carefully dried, and taped with fresh tape.

One of the most useful accessories is the desiccator shown in the accompanying sketch. It is made of sheet brass, with friction-seal top and bottom covers, and will hold four or five rolls of film. At the lower end is a false bottom, perforated and covered with a fine-mesh brass screen, held in place with non-corrosive solder. This supports the film-rolls, while below it is placed the calcium chloride. This desiccator naturally requires a dark-room for the insertion of the film and chemicals, which is often impossible in the field. A smaller desiccator, excellent for field use, can be made by soldering two 1,000-foot film-cans together, bottom-to-bottom, piercing holes in the bottoms, soldering in the protective screen, and placing the film in the upper section with the chemicals below. This unit can be used in a changing-bag, and in it film can be desiccated in the field after exposure and packed temporarily, later to be re-desiccated more thoroughly in the large unit at the base of operations, and carefully re-packed. If the expedition is to be out long, it is often a wise safeguard to

desiccate and re-pack all exposed film at regular intervals. In packing the film, well-dried newspaper can be used, though regular block photographic wrapping paper is safer, and less likely to contain chemical impurities. I have always found it wise to dry the paper, cans, etc., in an oven until the lost trace of moisture has been thoroughly baked out. The film should be rolled as tight as possible without "cinching," and wrapped tightly. After placing the film in the can, the core-opening, and every possible space should be tightly filled with dry paper; when the cover is applied under pressure, it should exclude all possible air from the container. The joint should be taped with extra care. Always save your old tape!

There is a further phase of Expeditionary Cinematography, about which too little has ever been said. This is the fact that in journeying to distant lands, a Cinematographer becomes more than an individual: a representative of the Camera Profession. For too many Cinematographers—and I do not refer to cine-kodaking tourists, but to professionals—have behaved cavalierly in these outlying parts, and brought our entire craft into disrepute. It therefore behooves a Cinematographer to conduct himself "as a Cinematographer and a Gentleman" at all times, cooperating carefully with his own Consul and with local authorities, taking care not to infringe any regulations or customs, Governmental or religious, and to uphold the honor of his profession. Quite aside from military and police regulations concerning things and areas which may and may not be photographed, there are always some peculiar native "tabus" which should be scrupulously observed. Many races (by no means all primitive ones, either), hold that to be photographed is to yield a part of one's soul to the photographer, who may thereafter always influence one's life and acts; others resent having certain holy places, acts, or religious observances photographed. Transgression of these "tabus" will not only close many avenues of local cooperation, but can often be physically perilous. The incident of a few years ago, when a mob in a small Turkish village stoned an American Consular representative to death for attempting to film a religious procession, should always be remembered. Make it a rule, therefore, to act in all ways as you would wish any Cinematographer who might precede you in such a locality to have acted, for while you may not expect to return, yourself, you can be sure that some fellow Cinematographer will one day follow in your footsteps, no matter where you may be!

Speth Dies

● Rudolph Speth, treasurer of the Eastman Kodak Company and an important figure in the growth of that business since he joined it in 1902, died of septicaemia February 22nd in Rochester. His age was 64.

Mr. Speth was born in Bavaria and educated at the University of Wurzburg. He reached the United States in 1892 and spent in Chicago most of the ten years until he joined Kodak. He was on account with the firm of Price, Waterhouse & Company when he was engaged by George Eastman.

AUDIENCE MUST BELIEVE

Continued from Page 143

in a dazzling high key. He poured in the light—lifted the actors right off the screen. Yet they weren't flat. He still got his depth and shadows. These scenes fairly scintillate; probably the most sparkling and brilliant scenes of the year's screening. They truly reflect the glamorous period.

And in these large vivid scenes he attained still further accentuation and local color by lighting costumes in still higher key. He brought rich costumes to the screen in all the full beauty of their exquisite detail. The audience could almost reach out and pick off a jewel or two for souvenirs.

Yet when he pictured Cellini as the artist, the superlative craftsman of fine metals, he clothed the workshop in rich, warm shadows. You could feel the calm solitude of the cloistered worker as he wrought delicate beauty in silver and in gold.

When he went into the prison and dungeon scenes, the key like the mood went lower.

The police scenes were of much interest photographically. The sets were all pure white on the studio stage. Every item of color and tone they possessed when they reached the screen was imparted by Rosher and his palette-and-brush lighting.

Do not conclude he is a spendthrift with his lights. He's not. Actually, he uses them sparingly and with rare discrimination. Indeed, he uses much less total light than most of his fellow cinematographers during the course of a production. He's a bit partial to arc lights. He always has them available.

He believes in close working alliance with the Art Director. The cinematographer has much to offer the co-operating set designer that contributes importantly to the scene's effectiveness when photographed and, more, in many instances points the way to simpler and lower construction costs. In turn, the

Art Director can simplify many of the cinematographer's problems.

A comprehensive vocabulary of photographic values, all the artistry which the cinematographer can command, all the tricks of the trade, so to speak, have come to Rosher's camera through his many years' devotion to the screen's

ever-developing needs. All come into play in his pictures.

The first gold statuette of the Academy of Motion Picture Arts and Sciences came to him in 1928. It is not surprising that his depiction of "The Affairs of Cellini" should again bring outstanding acclaim to his door.

matographer has been given new ways to see new angles on old familiar, and new penetration into things indefinitely small. The camera, with the aid of its master, the cinematographer, and his ability to soften or dramatize the subject through his knowledge of correct settings and backgrounds, can give the subject and story a magnificence, dignity, beauty, and brilliance that makes the present-day motion picture a thing of perfection.

Interpretative Photography Wins Folsiey Nomination

Continued from Page 142

By this, he does not mean that a situation the same as the one being photographed should necessarily have happened directly through the cinematographer, but a situation relative to the one being photographed should have been experienced, read about, or heard, so that the cinematographer would have been able previously to form some opinion on how such a situation should be handled photographically.

This acquaintance with the situation is vital because, before a cinematographer can expect to interpret the mood of the subject convincingly, he must have been able to have interpreted that mood himself at some time or other. Folsiey points out that he believes this experience of situation and understanding of moods is a factor that is too gen-

erally overlooked in all phases of production. The aim in making moving pictures is to present stories and scenes, which not only give an illusion of actuality, but are so vivid in their true interpretation of life that they, instead of remaining inanimate pieces of celluloid, become products that live and breathe and throb with the actual brilliance, vitality and personality with which all phases of life are endowed.

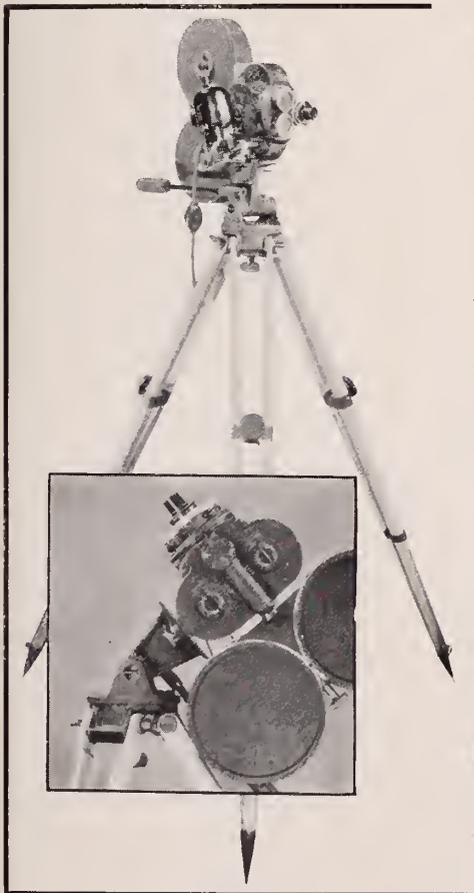
Folsiey assures us he is convinced, that although the cinematographer understands fully all of the manifest possibilities which he can obtain, through the blending of lights and shadows, he must also have an equal understanding of the machine with which he is working; because the lens of the camera is an extension of the eye. By means of it, the cine-

RHYTHMIC FLOW

Continued from Page 139

So we see, in the light of the two complementary cinematic flows of participative-camera and cutting (which ultimately are one and the same rhythm, and only partially realize cinematic movement), how inextricably co-mingled are the words, facial expressions, gestures and movements of the actors, and the director's handling of these, together with the psychology of expression and interpretation of the motion picture camera.

And it will be understood how very closely together the cinematographer and director and writer must work, having almost the same intellectual experiences as they conceive and watch a scene played. These men feeling the intensity and stress of the scene in their



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exact proportions and durations — the scene's starting instant and ending moment, and seeing these two points as they melt into the foregoing and succeeding shots—visualizing the scene as but a small longitudinal section of the whole picture's composite rhythm. Which

means that cuts and camera movements must be decided upon and integrated long before photographing. Which again means that the cinematographer will work from the roots of the picture, all the way up through the growing to the finished product.

RECORDING "ONE NIGHT OF LOVE"

Continued from Page 140

air from a special nozzle, instead; this not only gives a support which allows control of the mean depth of the cutting-tool's groove, but also serves—due to the vacuum created by the exhausting air—to clamp the recorder tightly upon the disc. A vital phase of recording practice, also, is rigid control of the atmosphere in the recorder-room, etc. The waxes are kept in a special cabinet, in which the temperature is thermostatically maintained at 80° F., and during recording operations, the recorder-room is supplied only with completely dust-free, conditioned air of the same temperature, and the blanks are transported to and from the pressing-plant in airtight, individual containers. For quality recording, it is as essential to keep the waxes free from even the most microscopic dust as it is to keep undeveloped film from any trace of light.

The common practice in preparing a stamping matrix from a wax record is to graphite the disc, or to brush it with a fine, electrically conducting powder, so that the wax may be electroplated to provide the matrix. This, however, is unsatisfactory for such high-quality recording, since the granular texture of the graphite or powder is naturally reproduced in the plated matrix and hence in the pressed record, and produces "surface scotch." Therefore these waxes are cathode-sputtered with a thin, uniform and extremely smooth surface of gold, after which electroplating may proceed in the usual manner.

In making the final pressing, instead of using a somewhat abrasive-textured plastic, as in conventional practice, where it is necessary to use a material which will tend to shape the needle to conform to the groove, a smooth, unobrosive cellulose acetate composition is used. By these methods, the surface noise of these records, when reproduced with a 10,000-cycle band of frequencies, is about 15db less than the surface

noise of the quietest commercial film. The re-recording operation is, of course, the most critical of all, for the record must be transcribed to the film so as to take full advantage of its wide volume-range, yet without exceeding the capacity of the film, and of the theatre-reproducers. It requires the utmost finesse on the part of the re-recording staff to do this so as to just reach—but never exceed—the upper volume-limit of the release film. Perhaps more than anything else about the production, I am proud of the skill evidenced in "One Night of Love" by our re-recording personnel.

A further experiment undertaken, though with trepidation, in this film, was in lowering the volume-level of the dialog sequences of the production by the equivalent of two fader-steps, not only in order to provide greater inherent contrast with the musical numbers, but to cajole projectionists to play the picture with higher fader-settings, and thus be able to have a yet greater volume-range than normal for the latter.

The same general procedure is being followed in recording Miss Moore's current picture. In preparing for this production, incidentally, we have developed a modification to the standard Western Electric light-volve which eliminates ribbon-clashing, and has proven of considerable value. In addition to slightly modifying the standard volve to permit the utilization of a greater portion of the ribbon's loop, we insert a tiny square of cellophane between the filaments at the supporting bridges: this swings one ribbon slightly out of the plane of the other, and eliminates clashing, minimizes the effects of over-modulation, and effectively somewhat broadens the recordable volume-range and quality. We are working toward further improvements in this respect and hope to realize more volume-range and quality in Miss Moore's coming picture.

TELEPHOTO SHOTS

Continued from Page 145

ing it over—I am convinced that your best picture was 'The Big House.'"

"Sa, why?" quired Wennie.

"Well, after doing a little research, I find that you knew the subject from inside out."

"We Only Heard"

● And here's what the studio publicity dept. considers humor . . .

Jackson Rose, while shooting some scenes for "Mutiny on the Bounty," was backing up to get a focus on the next scene. The railing around the camera platform broke, when Jackson pushed against it, and Rose plunged down toward the shark-infested waters below. Rose managed to catch hold of part of the platform and hang there while Syd Wagner and Frank Layd took pot shots at the fish in case Rose's fingers slipped. Finally several grips managed to tie a rope around Jackson's waist and drag him back up. . . . Some fun, eh?

"Playing With Dalties"

● Some kind of a record was rolled off at Paramount the other day when KARL STRUSS made a fifty-yard dolly shot of Mae West in her new Hays headache.

With the camera trucking along in front of her, Mae strolled from a bar at one end of the stage, through a dining room, along a hallway, up two short flights of stairs into a gaming room. (Now I know what they mean when they say an actor walked through the scene.) KARL told this department that when a cinematographer is shooting Mae, he never uses angles . . . All curves. . . .

"Good Hunting"

● GEORGE FOLSEY took John Arnold, Bud Lawton, and John Nickolaus for a very fancy sleigh ride over on the Bel Air Country Club, "smack 'em and chase 'em" field last Sunday. George bounced the little white pill over the greensward for a mere 80, and the other devotees of the turf choppers league did very good imitations of a slot machine. George said he was only practising for the forthcoming studio tournament. . . . (They tell me this guy Jones is good too.)

"Asleep On the Deep"

● GEORGE SCHNEIDERMAN, ace but-tan pusher on the Fox Foundation for Funnier Flickers, has a unique way of getting away from it all. For the past five months George has been working almost night and day. So right after the dancey, the "SCANDALS," was tied with pink ribbons, George pushed his canoe, "SCHNEIDERMAN CRUISER," far out on the cradle of the deep and intends to sleep until sometime later. . . .

"Picked Up From the Dailies"

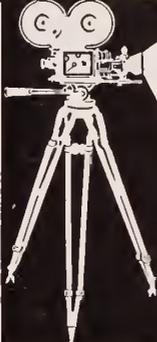
● Jimmy Starr, one of H'wd.'s "character teardowners," broke the huge scoop last after-noon that ERNIE HALLER, who has been grinding Max Reinhardt's "MIDSUMMER NIGHT'S DREAM," had his hands burned when his camera caught fire . . . maybe it was one of the tripod legs we wooden know. . . . The big conflagration consisted of three yards of cellophane 1/8 inch wide used to decorate the set. . . . Al Alborn was the hero . . . he extinguished the fire with his handkerchief.

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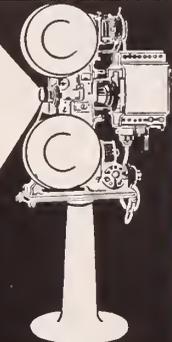


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Photography of the Month

Continued from Page 146

"GO INTO YOUR DANCE" (Warner Bros.)

Sol Polito, A.S.C.: Directing Cinematographer

"Polito's photography (and a tough Hollywood Reporter (March 13, 1935): job, too) helps a lot"—.

"HOLD 'EM YALE" (Paramount)

Milton Krasner, A.S.C.: Directing Cinematographer

Hollywood Reporter (March 13, 1935): "Milton Krasner's photography is first rate throughout."

S.E.R.A. RELIEF PROJECT

The S.E.R.A. Relief Project for motion picture technicians, originally sponsored by the American Society of Cinematographers, is in full operation under the supervision of Arthur Campbell, A.S.C.

With the active help and cooperation of the Producers Association of Hollywood, the A.S.C. secured donations of the necessary raw-stock from the leading raw film manufacturers and the facilities extended by the Roy Davidge Laboratories of Hollywood.

The purpose of the project is to give employment to the most needy and deserving cases of unemployed Motion Picture Technicians. They are to produce a monthly newsreel, covering the highlights of the relief projects within Los Angeles County.

An initial appropriation of \$10,449 was granted by the S.E.R.A. for the payroll of the Motion Picture Project. Office and studio space was donated by the Metro-Goldwyn-Mayer Studios, in their old scenario building at Romaine and Cahuenga Blvds. The loan of camera equipment was arranged by the Paramount, R.K.D., Universal and Warner Bros. Studios. The General Service Studios, through the courtesy of their Vice-President, Keith Glennan, provided the cutting and projection facilities. The Roy Davidge Laboratories donated the development and printing and Eastman Kodak, Dupont and Agfa, through their respective agents, donated sufficient negative and positive stock.



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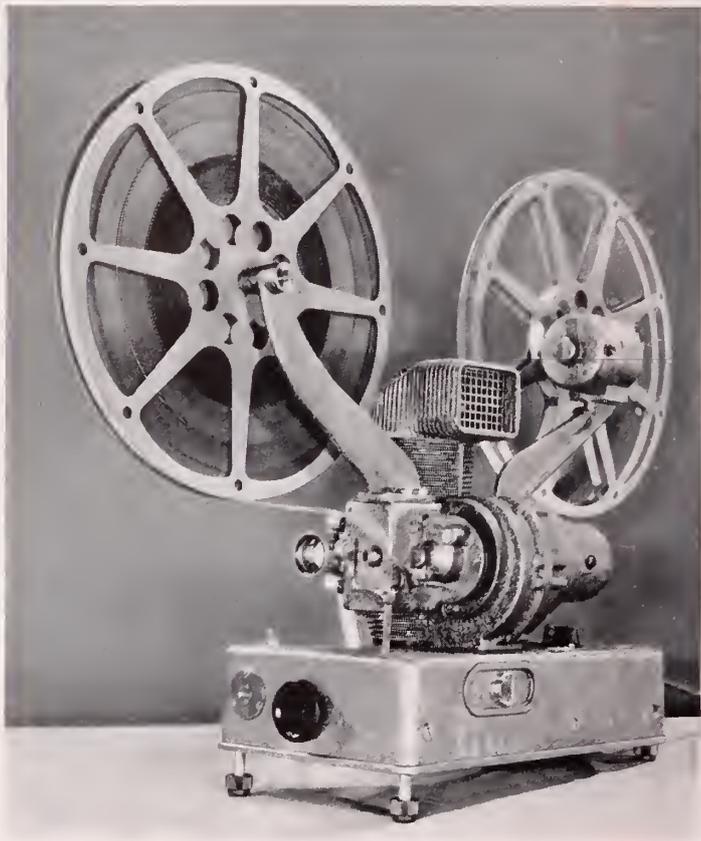
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AMATEUR MOVIES

APRIL

1935

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t his issue

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... and other features



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Agfa Fine-Grain Panchromatic Negative:

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Last year the grand prize winner was an 8mm user. The year before it was also an 8mm user. The size of your equipment is no bar to your winning.

The entries must be in the offices of the American Cinematographer by midnight, November 30, 1935.

If you wish further information address

CONTEST EDITOR

American Cinematographer

6331 Hollywood Blvd.

Hollywood, Calif.



AMATEUR MOVIE SECTION

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PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the **AMERICAN CINEMATOGRAPHER**. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Next Month . . .

- There will be a very good continuity contributed by one of our interested amateur readers. This bit of picture story telling can be made by two people, a cat and a bird. You'll want to try it.
- Wm. J. Grace will have a further installment in his series of articles on makeup. Grace will also give us a description of what he calls "The Comero I Should Like to Own."
- There will be other tempting morsels to read.



Squeeze about a quarter of an inch of foundation cream into the palm of one hand, and, using this as a palette, apply little dabs of the foundation all over the skin area to be made up. Then, with clean hands, spread the cream evenly, dipping the fingers frequently into water to thin the cream and smooth it out.

NOW that we have provided ourselves with the requisite materials for motion picture makeup and have made convenient means for using and storing them in a case which can be put away between experiments, suppose we get down to serious business.

Few people possess skins which will photograph creamy smooth, and even some of these photographic oddities find need far at least some smoothing makeup. The pores and wrinkles of the average person seem to be enlarged and magnified by the camera, a trick which is probably due to the fact that the lens discriminates between black and white and dark and light quite impersonally.

To fill up these tiny fissures and pits, then, it is necessary to apply some material which will photograph the same in color as the skin itself would photograph, but which will smoothly overlay the tiny blemishes and give the appearance of fine texture. That material is grease paint to the stage or screen artist.

However, this new material which Max Factor puts out is much different from the old sticks of sticky, thick, goeey stuff which used to be standard. The foundation cream (a term more appropriate than "paint") is smooth as toothpaste and about the same consistency. It is applied in dabs all over the desired skin area, and spread evenly and thinly with water. It seems peculiar that a "grease" which is usually an immiscible substance can be thinned with water, but it is the actual truth here.

Dabbling

For the average use on the face, about a quarter of an inch of the foundation cream is squeezed out into the palm of one hand. Being right-handed, we used the left palm, applying the cream in small dabs with a finger of the right hand all over the face. Then, the hands must be wiped clean of paint and the spreading is begun.

Frequently dipping the fingers in a bowl of water, each little dab of cream is then worked out and evened over the entire surface of the skin, blending the cream clear up into the hair, down deep on the throat, and even the ears if they are to show. If the spreading has been properly done, the cream will feel as smooth as silk and have no apparent thickness. Too much water will perhaps make the foundation too thin, but enough must be used to make the cream "flow" smoothly and evenly into an almost invisible coating.

The use of wetted fingertips seems to be very important with this foundation. We tried spreading it dry, but it left the skin feeling "pulled" and uneven, and the appearance was rather blotched. A bit of water, tho, made all the difference in the world, so don't forget to have a bowl of water handy while spreading the foundation.

Now as to the right shade to use. These pancro colors, you know, are graded shades of a flesh color, ranging from very light to a deep sun-tan. I can't tell you the exact shade to use for any one person, any more than I can tell you "how long is a piece of string." We found, tho, that for straight makeup the shade which most nearly looked the same as the skin itself was pretty close to right. My wife has a rather fair skin and used No. 22, while the other fair lady in the pictures was darker-skinned and used No. 23 or Na. 24. In another article will be shown the effects of using darker shades, but they will come under the head of character work and will be discussed there.

Now comes what feminine experimenters will enjoy a lot—eye shadow. What woman hasn't yearned, albeit silently, for the alluring beauty of well set-off eyes such as her favorite screen star possesses? Of the three shad-



Using the No. 6 grey shadow, accentuate and frame the eyes by setting them in a subtly contrasting area. Since light normally falls from above, eye shadow is quite necessary in motion picture work, because the natural shadows may disappear under studio lights.

in Makeup Materials —Part Two

by
Wm. J. Grace

ows in our mokeup kit, we found the No. 6 grey was the best far eye shadows. The Nos. 21 and 22 shodows probably ore best for choracter work in making sunken cheeks and the like. Moy this caution be given in eye shadow application, however: don't put it on tao heavy or the result will probably be burlesque. Put an a little more than you would like if you were to appear on the street, tho, for the comera requires slight exoggerotion in shade differential.

Eye shadow will in most cases odd considerably to the depth of eye beauty, for it frames the eyes becomingly. It is applied and worked out in such o way os to blena

into the rest of the calar, with the deapest color of the nose corner of the eyes.

Lips provide still more thrill to the lodies, but there is a slight difference in principle between street and movie lip rouging. Perhaps you've noticed that most movies ore made with the camero slightly above the octors' faces. This means that the upper lip will opear thinner thon is natural, and I've noticed that the upper lips of octresses in the latest photoplays seem to be thicker thon normal to offset this comero ongle.

We found that our lip rouges could best be applied without disturbing the rest of the mokeup by using the poper liner sticks. I understand profesionols use liquid rouge and apply it with o comel's hoir brush, but our lip rouge is in coke form sa we used liners. Cupid's bows aren't the roge ony more, so we steered cleor of thot type of lip.

Application of block mosque to the loshes is something the lodies know more about than this writer, so we leove thot to you. It is quite necessary for feminine screen beauty, of course, to use this masque. Also, the brows may be accentuated slightly by using the eyebrow pencil.

Now far the finishing. Gently pot powder of the some poncro number as the foundation cream you used, and brush the whole foce with a soft foce brush. This will even up the whole makeup and blend every color softly and smaothly, leaving no troce of o shine.

That's oll for this month, but practice stroight mokeup until you get the "feel" of it. We'll go o little deeper next manth.

Powdering over the whole makeup is done the last thing. The sole purpose of the powder, which is the same shade as the foundation cream, is to blend smoothly every shade and tone and to prevent shiny reflections from brilliant lighting.



How to



TITLES should do two things. They should briefly describe or explain the sequences, tying them together if necessary. And, second, they should add zest and pep to the picture story. This can be done by proper "key-noting" or "stage setting"—using appropriate backgrounds for the lettering and using letter types that may in themselves help to build atmosphere.

For example, appropriate material for a "lead" title of the "Century of Progress" might be selected from the following: A railroad folder of the line you traveled on, the cover of the official program, an enlargement of one of your still pictures of the entrance to the grounds or of some dominating building or scene that typifies the Fair to you and which will strike the "key-note" for your series of shots. Subtitles may be somewhat simpler without backgrounds if you prefer.

Now, here are some examples of how various styles of lettering may be used as stage settings. For a vacation trip, your title letters may be formed from twigs or pine cones, or sea shells, or other objects typical of the trip. A picture post card or a souvenir trinket will perhaps give just the right note. A four-leaf clover, a child's toy, a slate with inscription in chalk, a snapshot, a calling card, a newspaper headline, a magazine cover or "ad" would lend variety and "variety is the spice of movie titles."

"But," you may ask, "how can I put these various things onto a movie film so it can be spliced into its proper place ahead of the scene? Most of them would be so small that they wouldn't show up properly with my regular equipment."

True enough, if you have no titling device. But the "universal titler" permits making titles of various sizes, under ordinary light conditions, and with "copy" arranged either horizontally or vertically, as the occasion demands.

This "universal titler" makes titling easy for the person who is not an expert at lettering or art work. It gets away from the monotony of typewritten titles. With its help white letters on dark backgrounds become a simple matter, even for reversible film. In short, it seems to answer every long-felt need, even to the matter of low cost.

The "universal titler" consists of four main parts—base, title-holder, camera-mount and lens-mount. By merely adapting the camera-mount and working it at proper settings, this titler is suitable for use with any 8mm or 16mm camera. The list of materials in Table I will cover various types of machines, though for the sake of clearness, we have chosen to illustrate only one, a fixed-focus Cine-Kodak Eight (Model 20).

Top: Universal Titler in vertical position using 2-inch movable letters and 1.00 diopter lens, 31 inches away. Cross lines on track show what lens is to be used at each setting.

Bottom: Camera-mount and lens-mount complete.



Build a Universal Movie Titler

by
Lindsley W. Ross

Rigidity is a prime factor in building a titler for vibration while filming will spoil even the best of title subjects.

The base acts as a track for the camera-mount to slide on. It also supports the title-holder. It consists of a 3-foot board (6 inches wide, 1 inch thick) screwed onto an 18-inch two-by-two placed crosswise at each end. Two one-by-two strips are also screwed onto these two-by-twos, flush with their ends, to act as braces. The 6-inch board is provided with two $\frac{1}{2}$ " by $\frac{1}{2}$ " strips of molding which are later nailed on top, along the edges, so as to form a "track" within which the camera-mount will slide without any side play.

The title-holder is simply a large, flat board with its

bottom placed at right angles to the base. It should be made of $\frac{3}{4}$ -inch plywood, 18 inches wide and 20 inches high. Screw it against one end of the base. It is held rigidly at right angles by means of two wooden strips ($\frac{1}{2}$ " by $1\frac{1}{2}$ " attached respectively to each side, half way up, having their other ends screwed to the ends of the two-by-two crosspiece at the far end of the base.

The camera-mount must also be rigid at whatever setting it is to be used. It is built on a sliding block, $4\frac{1}{2}$ inches wide, 8 inches long and $\frac{3}{4}$ inches thick, preferably of plywood to prevent warping. As it slides farther away from the title-board, a larger area is included in the field of the camera, very much like the operation of an enlarging camera.

Now build up a solid "cradle" for your movie camera on this sliding block, adjusting it so the camera lens will be opposite the middle of the title-holder, about 9 inches above the base. For the cine-eight, screw a $5\frac{1}{4}$ -inch length of two-by-four vertically on the sliding block near the rear end, on which to rest the camera. Screw an upright U-shaped piece of plywood on the block crossways directly behind the upright two-by-four to act as a "cradle" for holding the rear of the camera in alignment. It should be $\frac{3}{4}$ "x4"x9" with an opening $1\frac{5}{8}$ " wide and $3\frac{3}{4}$ " deep. A strap with a snap button over the top of the machine will hold the camera tightly in place. Tack the two strips of molding lightly into place, to make a straight, snugly fitting track for the camera-mount.

To line up the camera so it will always point directly ahead, move camera-mount to one end of the base, lay a yard-stick or other straight-edge along side of the camera and take a "sight" on the title-holder. Place a dot on the title-holder where "sight" is located for that particular distance. Check by moving the camera-mount to the other end of the base. Sight again. If both "sights" hit the same spot, fasten the front end of the camera in place by means of short strips of wood. Check likewise for "up and down" accuracy. Keep all keys, release buttons, etc., of the camera in the clear. Shim up one end or other of the camera with cardboard if necessary and glue or tack



Universal Titler complete in horizontal position making title from newspaper headline, using 5.00 diopter auxiliary lens, $7\frac{1}{2}$ inches away.

LIST OF MATERIALS

- 1 board 1"x 6"x 36"
- 2 pieces 2"x 2"x 18"
- 2 pieces 1"x 2"x 36"
- 2 pieces 1/2"x 1/2"x 36"
- 1 piece plywood 3/4"x 18"x 20"
- 2 pieces 1/2"x 1 1/2"x 40"
- 1 piece plywood 3/4"x 4 1/2"x 8"
- 1 piece 2"x 4"x 5 1/4"
- 1 piece plywood 3/4"x 4"x 9"
- 1 piece plywood 3/8"x 2"x 10"
- 1 strap (12 inches) and button snap
- 2 1 1/2" metal clamps
- Flat black paint, if desired.
- Auxiliary lenses as desired.
- Screws, brads and thumb tacks.

it into place. It might be necessary to readjust the strips of molding.

The last item is the lens-mount. Any device is all right if it will hold any one of a series of auxiliary lenses directly in front of the camera lens, very much like a portrait attachment. The problem is somewhat simplified if all the extra lenses are similar in size. A wooden mount can be made out of a two-inch strip of 3/8-inch plywood about 10 inches long, placed vertically in front of the camera. Before screwing it into position, mark a point opposite the center of the camera lens. Start to bore a 1 1/2-inch hole, carrying it only 1/8 inch deep. Finish with a 3/4-inch bit. Thumb tacks or adhesive tape will hold any of the auxiliary lenses in place.

Several lenses will be required, one for each size of field to be covered (see Table II). Three is enough to begin with, viz. 1, 2 1/2 and 5 diopters, respectively. Any type of lens with these "powers" will do and there may be some in your own camera equipment. An auxiliary lens lets you work with wide open stop, thus reducing the necessity for intense light. Two photoflood lamps (with reflectors) 18 inches from the title will ordinarily permit work with f5.6 opening at night. This is the equivalent of "cloudy" daylight.

Accompanying photographs show the universal titler in use in both horizontal and vertical positions. In the latter case two small clamps are used to hold the camera-mount in place. The title-holder is then horizontal, permitting the use of loose letters like those shown. Alphabet sans letters (drv. of course) are irregular enough to be somewhat artistic and are light in color. Try them with a 2 1/2 diopter lens.

Don't try trick backward titles with the cine-eight, as the finished film is non-symmetrical and the titles would be reversed (right to left), even if taken upside down. For "flutter-in" effects you can place a letter or two, run the camera a second, stop it, slip another letter or two into position, run the camera again, and so on.

Cut a mask for each area to be filmed, making them the full size of the title-holder, to facilitate proper centering and proportioning. When using scrolls, actual stage sets, toys or anything having much thickness, slide the camera-mount back from the title-holder by an amount equal to half the thickness of the object. If very thick, stop the camera down and use more light.

The entire cost for lumber and clamps should not exceed \$1.00. Auxiliary lenses are extra, of course. But

irrespective of cost, this universal titler will out-perform any fixed-focus titler ever built.

There is a great deal of satisfaction in being able to properly title a picture. There are times when a certain picture calls for a certain dressing of titles. This cannot be done with a type of titler that is rigid. It was for this reason that I designed this titler for myself. While it is not a piece of craftsmanship that will win a lot of gold medals for me, still it performs for all of the things I wish to do and that to me is most important.

I want to pass it on to others as I feel there are some who also would get a great deal of satisfaction out of creating titles that would possibly more fit the theme of their pictures. I have attempted to keep the construction simple because I myself could only do it in a simple way as I am not too mechanically inclined.

For instance, if you have the various auxiliary lenses listed you can make what is commonly called a zoom title in the professional film. You start it out small at first in the center of a big field. You move the camera up to the next position for the auxiliary lens and shoot a few frames, and so on you keep moving the camera forward, adding a few frames at a time. The result is that the letters will get bigger and bigger as you proceed and seem to want to pop right off of the screen and out into the audience.

This is especially effective when you have such titles as the word "help" when someone is calling for assistance. It gives the psychological effect of the voice getting louder and louder and also makes it more dramatic.

Titles as you know will frequently save otherwise mediocre pictures. Some will tell you to be sparing with your titles, but there are times when many titles will save the production.

It is claimed that many of the professional pictures in the days of silent movies were saved with good titles. Why shouldn't that be true of the amateur's work? If they make the film more interesting then let us have more titles . . . and let them be more interesting as to makeup.

TABLE II
CINE-KODAK EIGHT (MODEL 20)

Diopter Power of Auxiliary Lens	Distance of Title from Auxiliary Lens (Focal Length)	Size of Area of Title Covered
1.00	31"	8" x 10 3/4"
1.25	25 3/4"	6 3/4" x 9"
1.50	22 1/4"	5 3/4" x 7 3/4"
1.75	19 1/2"	5" x 6 3/4"
2.00	17 1/4"	4 1/2" x 6"
2.25	15 1/2"	4" x 5 3/8"
2.50	14 1/4"	3 3/4" x 5"
2.75	13"	3 3/8" x 4 1/2"
3.00	12"	3 1/8" x 4-3/16"
3.25	11 1/4"	2 7/8" x 3 7/8"
3.50	10 1/2"	2 3/4" x 3 5/8"
3.75	9 3/4"	2 1/2" x 3 3/8"
4.00	9 1/4"	2 3/8" x 3 1/4"
4.25	8 3/4"	2 1/4" x 3"
4.50	8 1/4"	2 1/8" x 2 7/8"
4.75	7 7/8"	2" x 2 3/4"
5.00	7 1/2"	1-15/16" x 2 5/8"

Place auxiliary lens against front of camera lens mount.



Use Your Library

says
Clyde De Vinna, A.S.C.

EVERY now and then an amateur movie-maker asks me what books he ought to read to improve his knowledge of Cinematography. There aren't many available—and only a few of them are recent enough to be up-to-date in every respect; but believe me, they can save you a lot of time, effort and film if you'll only take the trouble to use them.

Undoubtedly the best and most recent books are the two "Cinematographic Annuals," which have a great deal to offer the amateur in articles written especially for him, as well as in articles dealing primarily with professional subjects, but which contain many things useful to the non-professional, as well.

Then there are two excellent books by Herbert C. McKay, F.R.P.S., "Amateur Movies" (1928) and "Motion Picture Photography for the Amateur" (1924). These deal specifically with the earlier amateur problems, and though they appeared years too soon to tell you much

about the latest developments, such as Kodacolor, 8mm, SuperSensitive film and Photoflaads, they have a great fund of valuable information.

Still earlier, though still useful, is Austin Lescorboua's little "Cinema Handbook" (1921), which is written from the viewpoint of the 35mm amateur (16mm hadn't been born in those days), and Carl L. Gregory's "Condensed Course in Motion Picture Photography" (1920), which was written as an instruction-book for would-be professionals of a decade-and-a-half ago. The earliest book I know of is "Cyclopedia of Motion Picture Work" (in two volumes), written by David S. Hulfish in 1911, and later revised as a single fat volume called "Motography."

Most of these books, if not all of them, are available in the public libraries of most of the larger cities. In spite of the fact that all but a few of them appeared years before the amateur movie-maker of today came into being, they are still surprisingly helpful if you take the trouble of adapting what they say to fit modern conditions. The basic principles governing good camerawork don't change, even though technical progress may make some of the minor details seem outmoded. When Lescorboua, writing about the importance of using a tripod and rehearsing action, and especially panoraming or tilting shots, while watching through the finder, says, "Perhaps these precautions are too fussy—perhaps; but film costs money; subjects cost money in many cases; and failures might as well be avoided whenever possible," he was voicing something that the amateurs of today, and ten years from today, would do mighty well to remember. So, too, when he goes on, "—have the head of the tripod perfectly level, so that the tilt or panoram will be straight in its entirety."

I could quote a dozen similar things from each of these books—but you'll profit more if you dig them out yourself. However, in the earlier books—all of them, in fact, except the "Annuals" and McKay's later work—you will have to modify the parts dealing with exposure and interior lighting. It's a curious thing, but in the old days, with slower film and lenses than we have on even the cheaper cameras now, cameramen used much smaller exposures. For instance, in Hulfish's book there is an exposure-table in which we find a recommendation to use, in circumstances where a modern amateur, with SuperSensitive film, would probably give f:22—an opening of f:45. (I hope the printer doesn't make that four point five, for I really mean f: forty-five!) The reason for this tremendous difference is the fact that now-a-days we develop our film much differently. Twenty years ago, the movies hadn't outgrown the still-camera technique of the late 90's: short exposures, stopped 'way down for super-critical definition, and a tremendously strong development which gave you a negative that was almost solid black. This in turn resulted in an absolutely horrible degree of contrast (remember those early soot-and-whitewash movies?) and huge grain-size. In comparison, we merely wave our film over a weak developer—but our results are infinitely more pleasing. More natural, and they will stand projection on much larger screens. The matter of interior lighting, of course, was based on arc and mercury-vapor lights, which are now obsolete in the studios, and totally unknown in amateur-movie work. For practical purposes, incandescent lighting (which includes photofloods) wasn't practical for movie work until Panchromatic film came along, while home-movie interiors weren't practical until SuperSensitive arrived.

Aside from these two points, however, much of what you'll find in these books about the basic foundations of

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A Continuity for Rainy-Day Movies

by
William Stull, A.S.C.

NOT so many years ago, people used to jack the family car up in the garage as soon as the first snowflake appeared, and forget about motoring until it was time for the springtime sulphur-and-molasses. Now they drive all the year 'round, and are especially thankful for the gas-buggy in the slushy, showery spring months. But I still know quite a few folks who tuck the family film-burner away on the shelf from Thanksgiving to Decoration Day. I'll admit that a few years ago this was a pretty smart thing to do, as the film and lenses then available weren't fast enough to guarantee satisfactory pictures in any but the most poetic spring weather. But now that we have lenses and film that will let us make pictures in any weather, why not take advantage of the season's cine subjects? Here, for instance, is a simple con-

tinuity which will at least suggest some of the things you can find to shoot at this time of the year.

"APRIL SHOWERS"

Scene 1. Long-shot of a house, blanketed in snow. FADE or LAP-DISSOLVE to

Scene 2. Same, but on a sunshiny day when the snow is old, dirty, and beginning to melt.

Scene 3. Medium-shot, from outside, of Junior, sitting at a window, looking intently out.

Scene 4. Closeup of Junior's head: he looks upward, at something just outside the pane. Then his eyes travel quickly down, as if following something, then up—then down.

Scene 5. Closeup of an icicle, melting. At regular intervals a drop forms at its tip, grows, and drops off. (Get a cross-light on this, preferably against a dark background.)

Scene 6. Medium-shot, inside the room. Junior is at the window, then turns and comes toward the camera.

Scene 7. Medium long-shot, looking toward a fireplace. A big chair is drawn in front of the fire.

Scene 8. Close shot of a pair of slippered feet on a footstool close to the fire.

Scene 9. Medium-shot, reverse angle. Father is seated in the chair, his face covered by a newspaper, which rises and falls regularly.

Scene 10. Medium-shot, from moderately low angle, across the chair; Junior appears on the other side of the chair, and speaks: The paper suddenly jerks down, revealing Father, just awakening.

TITLE: "Dad—let's go for a walk!"

Scene 11. Same as Scene 10; a short flash as Junior finishes speaking.

Scene 12. Closeup of Father, shaking his head.

Scene 13. Big-head closeup of Junior, speaking eagerly.

TITLE: "Aw—puleeze!"

Scene 14. FADE IN: Close shot of a boy's hands hurriedly putting rubbers on his feet. Pan right to show Father's feet slipping into galoshes.

Scene 15. Close shot as the two pairs of feet come down the steps and exit.

Scene 16. Long-shot: a pretty composition of melting snow, trees, and filtered sky. If possible, make with the camera pointed up toward the crest of a knoll. Father and Junior cross the picture along the horizon line, which is close enough so that the figures are of good size.

Scene 17. Close-up of the tiny shoots of early grass, or a spring flower, just starting up from the muddy ground; if possible, by a patch of melting snow.

Scene 18. Closeup of a robin.

Scene 19. Closeup of budding leaves on a tree.

Scene 20. Long-shot, similar to Scene 16.

Scene 21. Close shot of a small patch of melting snow, with a little trickle of water running from it.

Scene 22. Long-shot of a brook, raised by the melted snow, gurgling along in the same direction as the flow in Scene 21.

Scene 23. Long-shot of a large river, filled with broken ice. If possible, a sequence of short shots, from varied angles, showing an ice-jam, would be highly effective here.

Scene 24. Long-shot of Father and Junior, walking through another pictorial scene.

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Perfecting Home Projection

by
Wm. J. Grace

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I SHOULD like to advance the idea now that home movies have long enough been treated as a stepchild in the field of home entertainment.

Ten or twelve years ago, the radio was something to be fiddled with in the back bedroom, to be regarded as a playtoy entirely unworthy of the dignity and respect of a designated place in the living room. Rightly so, of course, for what tidy housewife would tolerate breadboard wiring, horn speakers, and messy batteries in her "company" room? Along came smart radio manufacturers with the idea that the radio might just as well be properly cabineted for acceptance in company, and radio outgrew its relegation to the place of all gadgets, the workshop.

Don't you think it is about time for home movies to grow up into a permanent position in the household, and take its place beside the radio and the phonograph and the piano?

This isn't the first time the idea of housing home projection equipment in respectable furniture has been advanced, as witness the several attempts by various firms to interest the cinephotographer in projection cabinets. The attempts, to be sure, have all died deaths from natural causes—chief among the causes being an almost utter lack of the designers to understand the reasons for such cabinets.

First, a cabinet offers, or should offer, convenience. It should permanently house all equipment in such a manner as to invite home movie shows. Portable screens, projectors, and associated equipment are all very well from the traveller's standpoint, but nowadays cinephotographers don't indulge in the pastime of traipsing over to the homes of friends to give shows—they give their shows in their own homes. Therefore, why go to such extremes in portability in projection apparatus when it isn't necessary?

Second, the cabinet, to warrant a permanent niche in the scheme of home furnishings, must be attractive, whether in use or not. As to the actual designs, there will be as many opinions as there are personalities involved. Some want every piece of furniture to match in period. Some don't care whether it matches other living room furnishings or not, so long as it is presentable. Personally, I have always believed it incongruous in the extreme to house a modern bit of apparatus, be it radio, home movies, or a phonograph, in period furniture. Such apparatus did not

exist in those periods, so why try to hide the modern individuality in out-of-date dress?

Third, any cabinet designed for permanent location in any one room should be as useful as possible, regardless of the equipment it houses. I don't mean that a radio would need built-in book shelves or reading lamps to make it more useful, for a radio is useful several hours every day. The idea, however, of combining with home movie projection apparatus other equipment of related nature, such as the radio, would be considered quite acceptable.

The other night I became involved in a discussion of how I would design a cabinet for my home projection equipment, and after some comparison of thoughts as to convenience, size of picture, general dimensions, and so on, I sketched the design accompanying this article. It appealed to me in its rough form so much that I began to wonder how many readers of AMERICAN CINEMATOGRAPHER would agree with me in its principles, if not in the complete design.

Home movies and radio are both modern developments, so the decision to fit the cabinet to the contents was the basic idea in the general design. And, since it will be only a short step from our present silent equipment to practically universal sound equipment, it seemed only natural to combine radio and home movies in the same cabinet. A single control panel for radio and movies was logical, and for the sake of refinement and convenience, this panel should be made removable, with a connecting cord connecting it to the set wound on a spring-return drum like a cigar lighter. Then, remote control for both radio and movies would add the finishing touch to complete convenience and showmanship.

The design shown is modern in its simplicity of lines, yet pleasingly soft in contour because of the rounded corners. The finish of the cabinet should be dull black, and the chromium trim around the bottom and chromium bars across the speaker grille break up the flatness by adding a flash of contrast. The matte chromium finish of the control panel also serves to break up the flatness of surface.

All projection equipment, cans of film, and radio are housed in the cabinet. When not in use, a flat strip curtain somewhat like a roll top desk covers the ground glass

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WHEELS OF INDUSTRY

Tripod Base

● Surgical-Mechanical-Research Company of Los Angeles announce a Tripod base for use on slippery surfaces or irregular surfaces like stairways or sloping platforms. It is claimed that with this device it is possible to adjust each leg separately or to slide the three legs as one unit into any position without altering their relative position.

High-Low Switch Lights

● A recent announcement of the Motion Picture Screen and Accessories Company of New York City tells of a light they are marketing which has three unusual features. It is usable both as a hand light and with a stand and in addition this light has a special switch which enables the user to dim the lights during the focusing period. This gives long life to photo flood lamps.

This is true of the horizontal lights of their bank of three lights, two mounted horizontally and one vertically.

Leica Exhibit

● E. Leitz, Inc., announces a display of salon Leica prints. The actual photographs of outstanding Leica cameraists such as Dr. Paul Wolff and other European experts are a feature of the show. Supplementing the European pictures will be a number of examples of work by recognized workers in the United States such as Rudolf Haffman, Harold Harvey, Clarence Slifer, A.S.C.; Jahn Moss, Thomas McAvoy, Henry Lester, Ivan Dimitri, and others. There will be three hundred photographs in the collection, the first time such an impressive gathering has been made available at one time.

At the exhibit will also be shown the latest accessories for the Leica camera. Following are cities and dates of exhibit: New York—Tuesday, April 23rd, to Friday, April 26th. Philadelphia—Tuesday, April 30th, to Thursday, May 2nd. Washington, D.C.—Monday, May 6th, to Tuesday, May 7th. Pittsburgh—Friday, May 10th, to Saturday, May 11th.

Detroit—Wednesday, May 15th, to Thursday, May 16th.

Chicago—Tuesday, May 21st, to Saturday, May 25th.

Boston—Tuesday, June 4th, to Thursday, June 6th.

Rolleiflex Salon

● On May 15 there will be shown an exhibition of photographic prints made by Rolleiflex photographers at the new, enlarged display and show rooms of Burleigh Brooks, 127 W. 42 St., New York.

Colonel Edward Steichen, internationally recognized as one of the world's leading photographers will constitute a one-man jury to judge the prints submitted to the 1935 Rolleiflex Salon.

A number of awards will be made to contestants whose work is adjudged outstanding by Colonel Steichen. These awards will be composed of cameras and other photographic materials and successful participants may select any type or make of camera or photographic accessory which they desire.

The first prize will be a first-class eighteen-day Caribbean cruise, fully paid on the ship Pastores. There will be other awards amounting to approximately \$500 in value.

Contestants will be limited to 4 prints each. Sizes of mounts must not exceed 16x20 inches. Prints need not necessarily be enlarged.

The Exhibition is open to everybody.

Enlarger

● The Derby Enlarger is now available with several added features, according to Burleigh Brooks. Its enlarging power is said to be limited only by the quality of the negative, up to a maximum of more than 40 diameters.

This enlarger comes complete with double condensers and a glass negative

holder, as well as a sliding combination mask, which gives four different popular sizes in one mask and eliminates the use of glass.

Protesting Legislation

● There is a piece of legislation pending in Pennsylvania according to Klein & Goodman that will mean much harm to the amateur photographer.

It would seem that the bill proposed would prohibit any amateur from selling pictures or prints in the state unless he was established in business in that state.

Klein and Goodman are circulating petitions and protestations against this bill for presentation to the legislature.

Flood Reflector

● Fatashop Inc. of New York City announce a Mogul base flood reflector for the super size photo flood lamps. The reflector has a doubly adaptable base for either table or tripod use.

Mortensen Book

● Camera Craft Publishing Company announce a new work by William Mortensen, Projection Control. Mortensen's fame as a photographer is recommendation enough for this work.

In addition to the valuable information on this subject the book contains many beautiful illustrations from Mortensen's camera.

Photo Optical Bench

● According to R. Fuess Inc. of New York, it is possible to get magnifications up to 200 times without the use of a microscope with miniature cameras with the use of their Universal Photo-Optical Bench.

They also mention the possibilities of this device in table-top photography with any type of camera as it is a complete photographic studio in itself.



CINÉ-KODAK SPECIAL

The 16 mm. Camera for the Serious Worker

Expert cinamateurs, doctors, educators, laboratory workers, engineers—members of these and other groups will find in the Special a 16 mm. motion picture camera of complete versatility, yet one reasonably economical to buy and to operate.

Fades, double and multiple exposures, dissolves, slow motion, masked pictures, speeded action, animation—these are but a few of the many unusual effects within the scope of the basic model of this outstanding camera. Yet so varied are the uses to which motion pictures can be put that adaptations of this basic model may be desired to fit the Special to your particular needs. The instrument shop in which the Special is fabricated will undertake to alter the camera to meet such individual specifications.

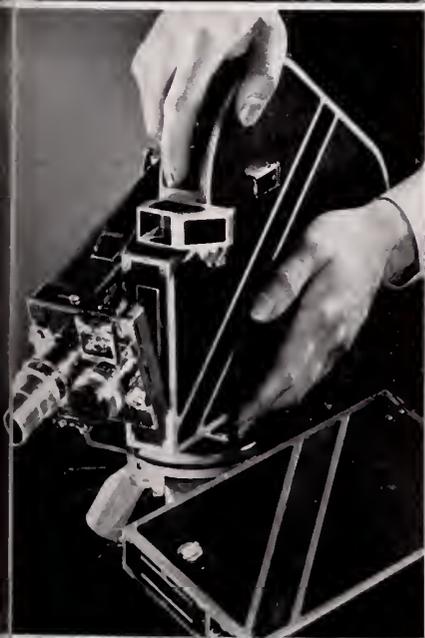
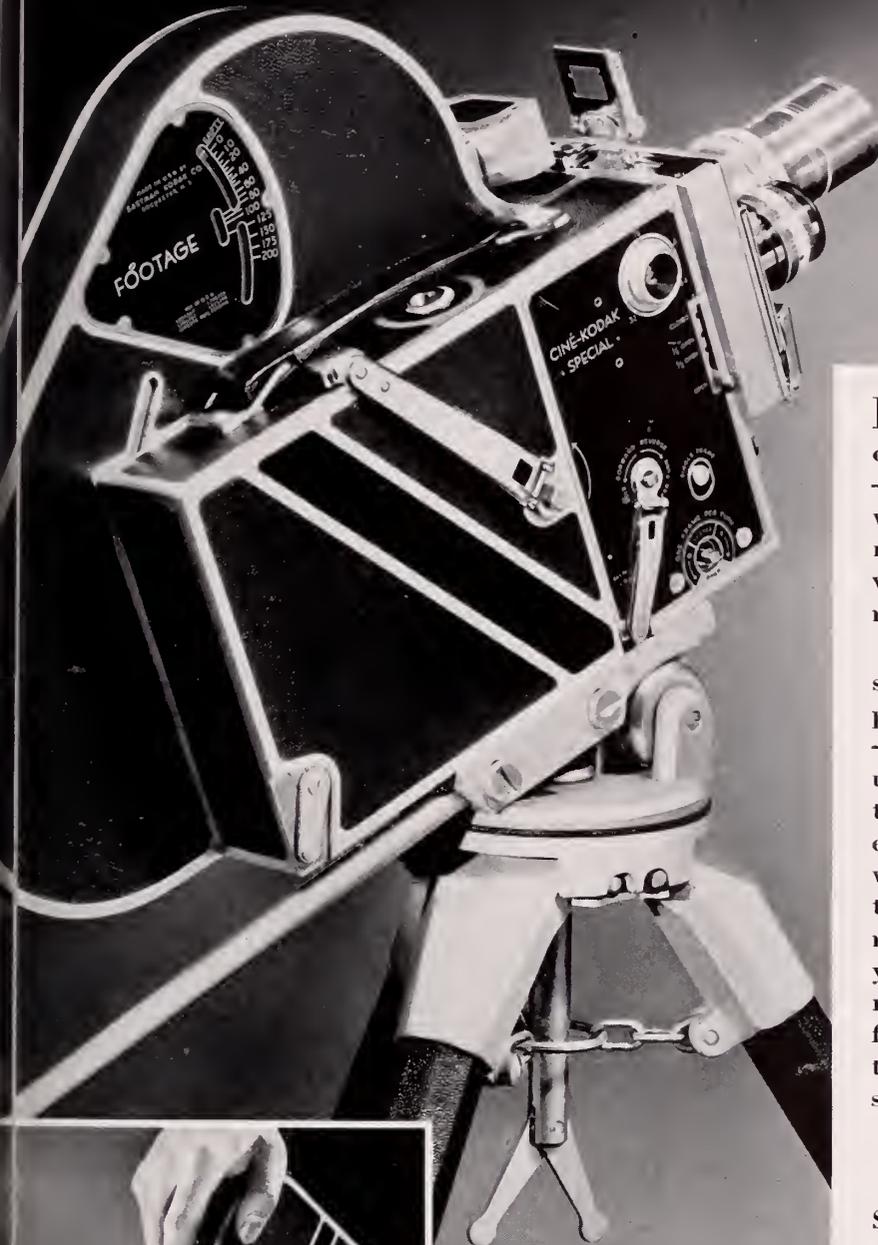
Write for free booklet

A copy of "Presenting Ciné-Kodak Special"—a handsomely illustrated, generous-sized booklet, detailing the many advantages of this finest of 16 mm. cameras—is available upon request. Write to Eastman Kodak Company, Rochester, N. Y.



Only Eastman makes the Kodak

As supplied, the basic model of the Special is fitted with a 100-foot film chamber—easily interchangeable with the 200-foot chamber (extra) shown above.





HERE'S HOW

by A. S. C. Members

How is the following animated work accomplished: "A pen is in the inkwell on a desk, all of a sudden the pen leaves the inkwell and writes the desired title on paper or a blackboard seemingly unaided"?

L.G.F., Chicago, Ill.

First an 8x10 still picture is taken of the drawing board and inkwell. Then a picture is taken of the pen to be used, this pen is cut out. The still drawing is now placed under the cartoon stop motion camera, which shoots downward so that the drawing lies flat on camera stand. A slit is cut thru the still in the top of the inkwell so that the cut out pen can be placed in the inkwell.

The stop motion camera then takes one picture of this, the pen is then moved a quarter of an inch out of the bottle, then another picture is taken. This is repeated until the pen has traveled to the desired position on the drawing board. A white background then is substituted for the photographic background so that it appears to be a closer shot of the drawing board. Now a line corresponding to the picture or lettering that is to be used is drawn, this line is about a half-an-inch long, depending on how fast the lettering or drawing is to be executed.

The cutout pen is now moved to the end of this line and another shot is taken. The line is now extended another half inch and the cutout again moved to the end of the line where another shot is taken, this gives the illusion that the pen is actually drawing the line. After the design is completed in this manner the pen is moved in quarter-inch movements back to the edge of the camera field. The original background with the same design is substituted for the one under the camera, which makes a longer shot showing the inkwell again and the pen continues to travel into the bottle.

WALTER LANTZ,
Head of Universal Cartoon Dept.

I have recently dropped 16mm and changed to 8mm. Now I have a bunch of 16mm film that I would like reduced to 8mm. I would like to do the reducing myself, or at least try it. Can you tell me how?

My idea is to use a 16mm projector and throw the film on a translucent screen, then having my 8mm camera set up similar to a title-making set-up, I would take the projected images similar to a process background. Would such a method be O.K.?

B.C.F., Penn.

Reductions can be made by method you suggest of using a ground glass similar to background projection, however, you will undoubtedly lose considerable quality. You are also photographing the glass itself which will add grain to your pictures and tend to flatten them out.

The other method would be by the optical printer process which makes use of your 16mm projector and your 8mm camera. The manner in which this is done in the studios is to remove the lens from the projector, placing a ground glass between the light and the film. Your 8mm camera must be lined up with the 16mm projector so that you will photograph the aperture only in the projector. Next it is absolutely necessary that both camera and projector shutters are synchronized . . . that is that they both open and close at the same time. This is usually accomplished by coupling the camera and projector together and running both from the same motor. This would undoubtedly be very difficult to do in view of the fact that your 8mm camera is now run by a spring motor and there is no arrangement for hand crank or in any other way of driving your 8mm camera. You would have to devise some method of running the camera independently of the spring. This whole set-up would possibly involve so much machine work and run into so much money that it would be more economical for you to have the reductions made by some professional laboratory already equipped for such work.

LYNN DUNN, A.S.C.

Please give me a good positive title developer. Also negative developer.

J.A., McCloud, Calif.

A positive title developer which we have found gives you very good blocks was printed some time ago by us. It is from a formula sent us by Mr. Schon, an engraver who made this formula up from a modification of engraver's developer. Here's the formula:

Solution I

Sodium Bisulphite	3/4 oz.
Hydroquinone	3/4 oz.
Potassium Bromide	3/4 oz.
Water to	32 oz.

Solution II

Caustic Soda	1 1/2 oz.
Water to	32 oz.

The developing solution is compounded of equal parts of solutions I and II. In warm weather, this may be diluted somewhat, if desired. With this solution, development may be prolonged almost indefinitely without greying the whites; and it gives exceedingly rich blacks.

A negative developer being used a great deal today by 16mm users for fine grain results is the Paraphenylen-Diamine-Glycin. Following is the formula: Paraphenylen-Diamine10 grams Sodium Sulphite90 grams Glycin 1 gram Water to make..... 1 liter Developing time: 22 minutes at 68° F.

The Paraphenylen-Diamine is dissolved in hot water (160-180° F.) and when thoroughly dissolved, the sulphite is added. The remainder of the water should be made up with cold water or ice.

This solution is normally of purplish-brown color, and has a certain mild-dyeing effect upon the image, giving it a cloudy yellowish appearance by reflected light. This does not, however, impair its printing quality, except perhaps to give a desirable increased density and contrast. One cannot recommend this developer for badly underexposed negatives, however. It is advisable to wear rubber gloves when working with this developer.

FRANK B. GOOD, A.S.C.



Photo by B. H. Casebolt

An enlargement made by Bland H. Casebolt from a 16mm Dupont Panchromatic Negative developed in Phenylene Diamine Glycine.

Santa Claus Gave Me a «Minnie»

by
Walter Blanchard

A FEW years ago I pulled a miniature camera out of my Christmas stocking. I couldn't help wondering, "Now I've got it, what in the world am I going to do with it?" This year an amazing number of budding minnecamerists are probably asking the same thing. After all, they've learned to make good pictures with big cameras; and they know the little "Minnies" can do amazing things: but now the camera is actually theirs, they can't help wondering if they can do as well themselves.

Used intelligently, there is no limit to what one can do with the modern miniature camera. Used with the same amount of common-sense you'd apply to making pictures with a Graflex or Kodak, the Minnie is the nearest approach to a fool-proof, mistake-proof high-grade camera yet made. Forgetting size, trimmings, and such-like non-essentials, a miniature camera isn't basically different from a big camera. It is smaller and more convenient; it has a relatively short-focus lens which, even in the larger apertures, gives a much greater depth of focus, and allows room for more error in focusing; it has a fine shutter, and uses inexpensive film so that you can

make a dozen exposures for the cost of a single big-camera picture. Most of them have an accurate, built-in range-finder, so that focusing is quick and easy. Once you get on to the basic tricks of minnecamerism, you'll find yourself getting better—and cheaper—pictures than ever.

The instruction-books say that the first thing to do is to master the technique of loading the camera; but this is so utterly elementary that we'll assume you mastered it before sitting down to the Christmas turkey. The really important thing, as a first step, is to get accustomed to working the range-finder quickly: if you get into the habit of jiggling the thing around, to be sure you're right, you'll find it hard to work fast when you really have to.

After these purely rudimentary points, the thing to do is to standardize on your film, developers and papers. It's lots of fun to play around with different emulsions and different "soups"—but that can come later, after you've learned to turn out really good pictures nine times out of ten with your standard materials. Standardize first on one certain type of film: then, if you want to save money, buy it in bulk—fifty or hundred-foot rolls—rather than in the individual daylight-loading cartons. The average daylight-loading cartridge for "Leica," "Contax" or "Super-Nettel" costs \$1.00, whereas you can buy a hundred feet of the same kind of film for \$4.50—and get twenty loadings for the price of four of the prepared ones! It is really very easy to load minnecam magazines, anyway: a little practice in daylight, using a strip of old film, will make the operation second nature to you. When you load, of course, you must work in total darkness if you use Pan or Superpan film; so it is a good thing to form the habit of laying out your reel, magazine, magazine-cap, raw film, and scissors in a regular, unvarying arrangement, so that when you reach for a thing in the dark you don't have to hunt for it. Incidentally, if you are short of magazines ("Contax" magazines, for instance, have been almost unobtainable this last year), or if you don't feel prosperous enough to invest immediately in half-a-dozen or more \$2 magazines, the Agfa cartridges come in mighty handy. After using the original roll of film, if you open them carefully, without tearing the cardboard or injuring the plush lining, you'll find you can re-load them many times. Incidentally, if you decide to standardize on the Eastman "Pan-Atomic" film, which is one of the best fine-grain panchromatic films available, though a trifle slower than SuperPan, you can get it in bulk under its professional name, "Eastman Background Panchromatic."

When you are actually making pictures, the same general technique that gave you good pictures with your big box will give you good ones with your minnie. Of course, an exposure-meter (preferably photoelectric) will help out tremendously. But if you haven't one, or can't afford one at the moment, chart your exposures for a few rolls, and study the results carefully: from this you can work out a basic exposure that will be a good guide under all conditions. For instance, using SuperSensitive film, the basic exposure for normal pictures, on an average, sunny summer day is 1/60 at f:16, while with Pan-Atomic the stop would be f:11. Since you are working for pictures that will eventually be enlarged, rather than contact-printed, work for a somewhat thinner negative than you'd usually make with your big camera. It is surprising how well a good minnecam negative, slightly on the thin side, but with good gradation, will enlarge.

A sunshade is a really important accessory when using fast lenses—so get one, and use it. The best type is that which will also take a 1 1/4" round filter. And

Continued on Page 175

equipment? I think so, and I believe it would have a healthy reaction in the way of convincing the family exchequer that home movies aren't so messy after all, and future filming sprees would be welcomed because of the pleasure of fine projection.

May I humbly offer this prediction—within the span of a few short years, the monio for portability in projection equipment of today will have almost completely given way for permanency and built-in convenience. Portable equipment will perhaps always be of-

fered, for the field will remain even tho to a small extent, but the bulk of home projectors will be housed in suitable furniture, ready for instont use. Whether the combination with radio will be universally acceptable remains to be seen, oltho most certainly sound reproduction facilities will be demanded.

In the meantime, and until manufacturers and cinephotographers alike become educated to the ideo, we'll sit back and do some more dreaming of the day when our home movies will reach "projection perfection."

SANTA CLAUS GAVE ME A "MINNIE"

(Continued from Page 173)

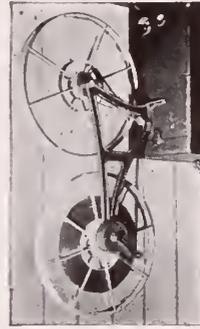
speaking of filters, don't bother with them until you are turning out about eight perfect negatives out of ten negatives without filtering; then hold yourself down to two or three filters, such as the Aero 2, the "G," and the 23-A. They'll give you all the correction you'll want for normal work—and won't load you down with extras. Filters should always be used sparingly, onyhow.

The extra lenses—speed, wide-angle, telephoto, and the like, look mighty oluring in the cotologues. They ore hondy, of course; but the best policy is to stick to a single lens for the first few months, at least, and master it. After all, your pictures will be enlarged, and you can mosk out whatever portions you don't want. It's much cheop-er than buying extra lenses!

If you try ony speed work, you'll find several important differences from big-comero procedure. For instance, if you have been using a Groflex, you know that, in order to get the mirror up and out of the way in time, you have to snap the shutter a measurable froction of a moment **before** you really intend to picture. The minnecom, having no mirror, and a very quick-acting shutter mechanism, is different: you can wait until the exact instont you want to record—then shoot. Likewise, you'll find that with your small picture-oreo, you won't need nearly such high shutter-speeds: 1/500 is fast enough for almost onything with a minnie—and the foster lens will give you a better-exposed negative.

When it comes to the dorkroom end of the picture-making, you're missing a great bet if you don't do your own. If you **have** to send your work out, be sure and send it to a really good minnecom specialist; otherwise your film will get ordinary treatment, and you'll be disappointed with the results. Minnecom developing is simple—and it needs only a dork closet and a bathroom. By all means use a tonk — "Correx,"

"Reelo," or the like. You can load the tonk in any closet, and then do the rest in the light. Stick to one certain negative-developer for the best results. There ore a number of excellent, fine-grain developers sold in bottled form, from which you can choose, if you aren't in a position to mix your own. My own preference is for the Poropheny-



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lene-Diamine type, which is a marvelous, fine-grain developer. There are plenty of prepared P-D "soups": my own experience, incidentally, leads me to advise **doubling** the developing-time given on most of these bottles—34 min., instead of 17, and so on. It gives a stronger, better negative.

When you have developed, rinsed and fixed your negative, you can easily wash it in the ordinary bathroom wash-bowl. A good way to ensure thorough washing is to double the film back upon itself—emulsion-side out, of course—and fasten it at the ends with an ordinary wooden spring clothes-pin. When you are ready to dry the film, hang it up wherever is convenient, preferably weighting the lower end with a film-clip or clothes-pin, and carefully swab the film off with damp cotton or chamois, to minimize the formation of water-spots.

Your enlarging can be done equally well in the bathroom, too. Again, stick to one type of paper, and one developer. Personally, I like to use a fairly high-contrast developer, and work from a soft negative. Of course, you will find it necessary to use several grades of paper—soft, normal, contrast, etc., for different negatives: but keep them all of the same brand of paper. There are

a number of fixed-focus minnecam enlargers, which automatically give you a good 4x6-inch print from a "Leica" or "Contax" size negative; but there is much more fun in using a regular miniature-camera enlarger, and masking down your pictures individually, excluding whatever you don't want in the print. These enlargers aren't so very expensive—especially if you use the lens from your camera for enlarging; and don't try to use ordinary enlargers for miniature negative work. It requires a far more perfected optical system than most older enlargers boast—really good condensers, a fine lens, etc., and a film-carrier that is specially designed for the small negatives, and will not scratch the film.

The secret of getting the fullest enjoyment out of any miniature camera is, in a word, keep things simple till you have gotten a thorough grasp of minnecam capabilities. Keep your outfit simple: camera, sunshade, two or three filters, and a light, walking-stick tripod will enable you to meet any situation. Standardize on one film, one negative developer, one brand of paper, one print developer; do your own darkroom work (it is both better and cheaper!)—and Minnie will show you how much fun there really is in making pictures!

USE YOUR LIBRARY

(Continued from Page 167)

cinematography—and all you'll find about the theory of light, photo-chemistry, and the history of moving pictures—will still apply, and be helpful.

Believe it or not, though, the most valuable and practically helpful little book I could mention isn't about cinematography at all! It is Eastman's little book "How to Make Good Pictures," which sells for fifty cents—and is well worth owning. It is written primarily for still photographers: but it is almost the only readily available book which brings things right down to date, telling how to use SuperSensitive film, the intermediate semichromatic films (Plenachrome, etc.) and Phataflaads. Not only that, but it gives you the practical details you need. The subject of exposure, for instance, is covered in such a way that you can easily follow the same methods with your cine-camera. Most 16mm cameras give an exposure roughly equivalent to 1/25 of a second in a still camera: so if you will follow Table No. 1, on Page 52, you will find that your exposures are approximately right. This table divides exterior subjects into four simple groups—and the illustrations give excellent examples of each group.

The section (Pages 40-43) on photographing moving objects is just as ap-

licable to movies as to still work, and so is the chapter on Landscape photography, which gives the basic principles of composition, exterior lighting, and so on. In the same way, what is said about using color filters, and the filter-factor tables for Pan., SuperPan and Verichrome films are just as accurate with movies as with still pictures.

The chapter on Home Portraiture by Daylight will give you a lot of useful information which can easily be adapted to cine work. In it, on Page 70, is a section on "Posing": for cine work, just change that heading to "Direction"—and you'll find your pictures growing more natural. A couple of pages farther on (P. 72) is a lot of information on how to pose people with relation to the light, so that you can subdue or accentuate any feature—such as big ears, a weak chin, deep-set eyes, or a bald head. Try those ideas out in your cine close-ups, either by natural or artificial light: both you and your victims will like the results.

The chapter on "Snapshots Indoors at Night with SuperPan and Photo-floods" is made-to-order for home-movie work. Not only are there a lot of mighty helpful suggestions, but pictures such as you'd want to make—

with diagrams of the lighting, and the details of the lens-opening and shutter-speed. Those made at 1/25 second can be absolutely duplicated with any cine camera; those where the exposure was longer can usually be duplicated by opening up the lens, for cine-cameras have, as a rule, faster lenses than the still cameras considered in this book.

Last—but not least—don't, in studying any of these books, overlook the chapters on the theory of photography. They may seem dry and unimportant, but they'll give you an understanding of what is happening when you make a picture—and why it happens. The result, of course, is that you'll ask your camera to do fewer impossible things, and have fewer failures. In fact, as one of my friends recently remarked, if on an amateur will carefully read, digest, and apply the information that is available to him in such books (even the oldest or most elementary) his pictures will be 100% better—and he'll enjoy his hobby more fully.

A Continuity for Rainy-Day Movie

(Continued from Page 168)

Scene 25. Long-shot — if possible with background of effectively-filtered clouds—of a farmer, plowing.

Scene 26. Closeup of the plowshare starting a furrow.

Scene 27. Medium-shot of a very young calf or lamb, tattering about on unsteady legs.

Scene 28. Closeup of the calf (or lamb).

Scene 29. Medium-shot of the animal and its mother, with the baby taking its meal. (If the shot is of a lamb, an effective angle will be from behind, showing the amusing tail-action while feeding.)

Scene 30. Long-shot, made in stip-mation, showing the sun, low in the sky and partly obscured by rapidly-moving clouds.

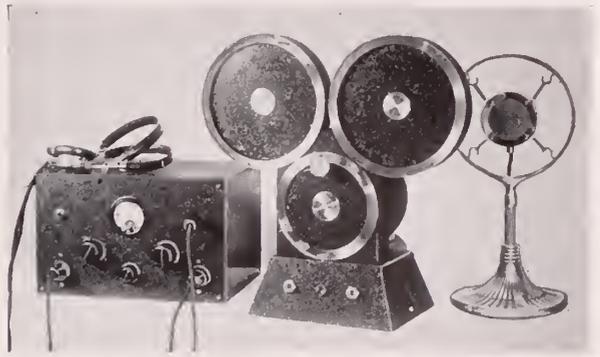
Scene 31. Close-shot of Father and Junior, made from a low angle, with heavily-filtered sky background. Father paints, obviously to the threatening clouds, and they turn about.

Scene 32. Long-shot of Father and Junior, running in opposite direction to that shown in previous scenes, and with their collars turned up.

Scene 33. (If possible) long-shot of the lamb, apparently hastening to shelter.

Scene 34. Long-shot: a short flash of a pile of dork, ominous-looking

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clouds. If possible, make in stop-motion, to suggest a rapidly approaching storm.

Scene 35. Close shot of the surface of a brook or pond, with raindrops pelt-ing the surface.

Scene 36. Long-shot (day) of a highway or city street, made on a wet day. A car passes, and leaves a strongly-marked track on the wet pavement.

Scene 37. Medium long-shot of a group of cars, stopped at a signal, on a wet day.

Scenes 38 a, b, c, etc. Closeups, from varied angles, of windshield-wipers starting to work. (Be sure and use at least two different cars for this, one with the wiper at the top of the glass, the other with it mounted below.)

Scene 39. Same as Scene 38: the signal changes and the cars start.

Scene 40. Long-shot of the traffic on a crowded city street in the rain. Make this with the camera at 8-frame speed.

Scene 41. Series of city-street night-shots, made on a wet night, with the wet pavement reflecting the auto-headlights, signs, etc.

Scene 42. Medium long-shot on the porch of the house shown in Scene 1. (Night effect), Father and Junior enter quickly, very wet, and go into the house.

Scene 43. Close shot of the rubbers and galoshes, wet and muddy. Above them will be seen the bottoms of two raincoats, dripping.

Scene 44. Close shot by the fire-place. Father's slipped feet extend themselves toward the fender.

Scene 45. Closeup of Father, in his chair. He looks rather cross, and speaks.

TITLE: "Nothing to see—all we got was wet!"

Scene 46. Closeup, similar to Scene 44. Father raises the newspaper before his face again.

Scene 47. Medium-shot, similar to Scene 6. Junior goes back by the win-dow.

Scene 48. Close shot of Junior, from outside the window. He is happy, smiling as though he had had a much better afternoon than Father did. Then a fresh burst of rain obscures the pane.

TITLE: THE END.

The rain fade-out in the last scene can be made at any time, with the aid of a garden-hose and an ordinary sprinkling nozzle. The majority of the scenes, it will be noticed, can be made at any time, as the opportunity arises; their connection with the story rests entirely upon the way they are joined together. Therefore, this sort of a film

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may be made slowly, as you find the chance to get the shots—or even assembled from bits of film you already have on hand. Almost the only scenes that must specifically be made for the purpose are the two sequences of Father and Junior in the house, and the few shots of the two walking across the country.

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In your cutting, you will improve the result if the scenes from 31 to 42 are cut quite short. If you are interested in rhythmic cutting, you can build quite an effective climax by making these shots progressively shorter, and possibly adding odd-angled "flashes" of some of the rainy-day traffic shots, to give variety and "punch."

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● The men who went with Byrd to the South Pole will tell you of their experiences . . . tell you of their technical difficulties and other interesting phases of this unusual assignment.

● Color is the talk of Hollywood. We will tell you what a cinematographer thinks of Technicolor: Ray Rennahan, who is responsible for the photography in practically all current Technicolor productions.



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THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science. Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship. To this end its membership is composed of the outstanding cinematographers of the world with Associate and Honorary memberships bestowed upon those who, though not active cinematographers, are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science. To further these lofty aims and to fittingly chronicle the progress of cinematography, the Society's publication, The American Cinematographer, is dedicated.

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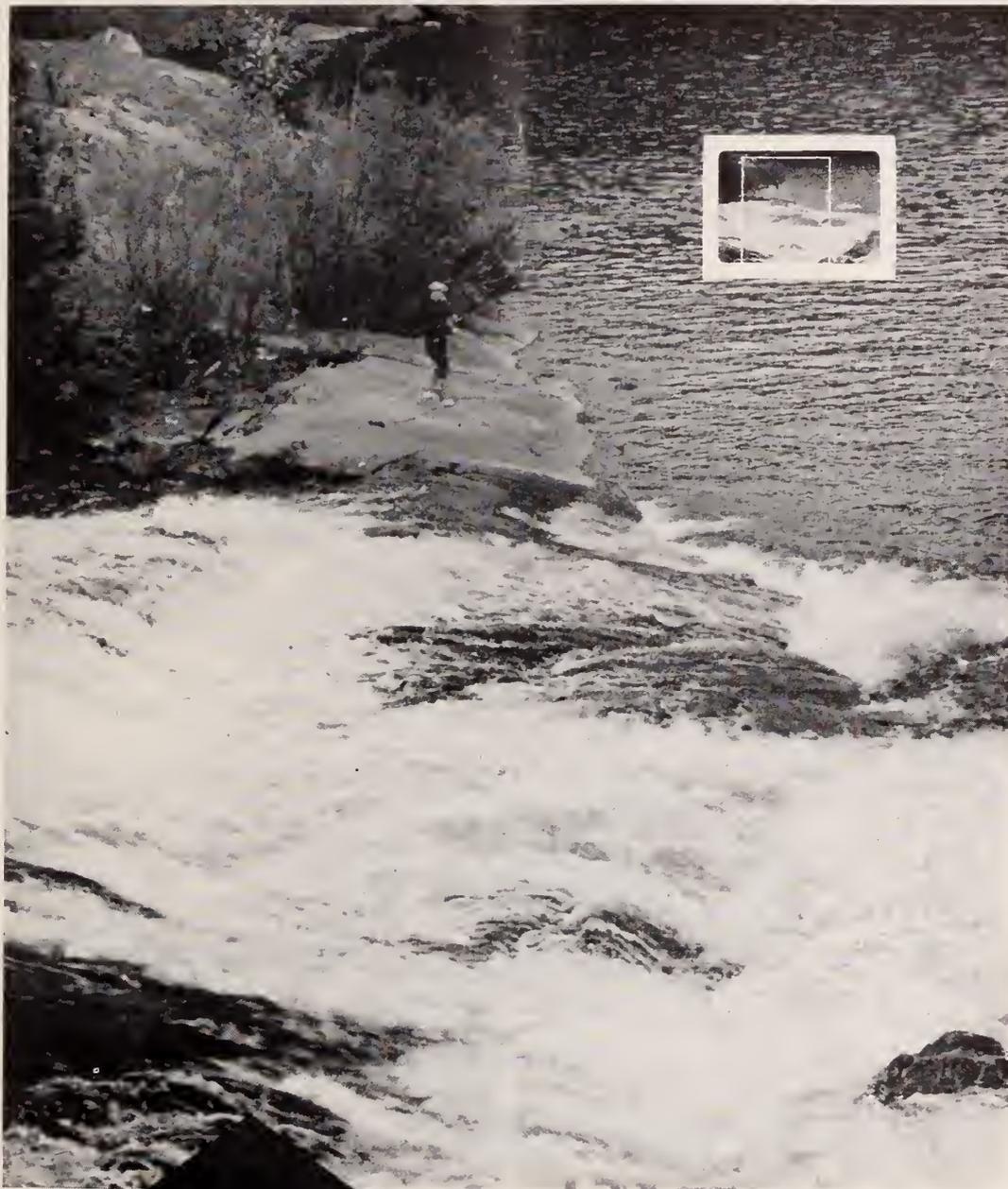
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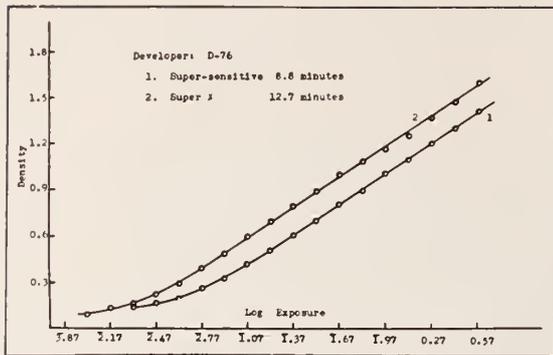


Fig. 1

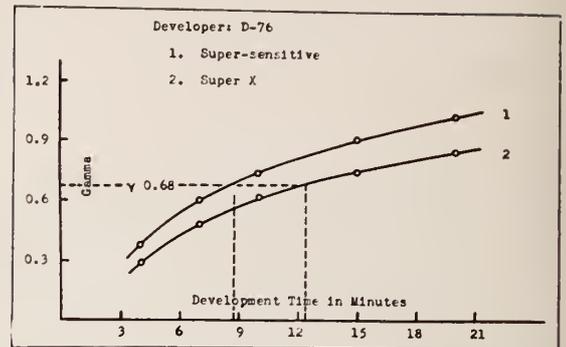


Fig. 2

Eastman Super X Panchromatic

by
 Emery Huse, A.S.C. and Gordon A. Chambers

West Coast Division
 Motion Picture Film Department
 Eastman Kodak Company.

Negative Motion Picture Film

PHOTOGRAPHY is the very foundation upon which the motion picture industry is built. Undoubtedly the most important product in photography is the negative film with which the various scenes are photographed. In accordance with the general policy of improving its products, the Eastman Kodak Company very recently placed on the market a new panchromatic motion picture negative film under the trade name "Eastman Super X Panchromatic Negative."

This new film upon laboratory tests shows a definite speed increase over other types of negative products without showing an increase in graininess. Actual camera tests have borne out these facts. Probably the first practical use to which this film was put was at the recent Hauptman trial at Flemington, New Jersey, where most of the courtroom action was photographed with this film. The speed of this emulsion was of material assistance to the news cameramen in obtaining adequate exposure under adverse lighting conditions. From the standpoint of general motion picture production it is felt this film will be extremely useful, particularly in background projection and miniature work where high speed emulsions are required. It should also prove its worth in normal production photography.

Samples of this film have been generally distributed locally and a summary of all reports received to date from those testing it substantiates the superior qualities of this film. It is the purpose of this short article to outline somewhat statistically the technical features concerning this new Eastman Super X Panchromatic Negative motion picture film.

A complete analytical study of the characteristics of this film was made sensitometrically in comparison with all types of motion picture negative films, including hyper-sensitized film. In the direct comparison this paper will contain data only for Eastman Super X and Super-Sensitive negatives and it must not be construed that the latter is in any sense of the word an inferior negative. It is our belief, however, that the characteristics of the Super X negative indicate some definitely superior photographic

qualities. The two main features of this new film which readily distinguish it from all other motion picture negative emulsions now on the market are its speed and development factors. These two factors when properly balanced in exposure and development make for very excellent photographic screen quality.

The sensitometric analyses on these emulsions were made following the orthodox procedure. All sensitometric exposures were made on the Eastman Type 11b sensitometer using both the normal negative setup, in which instance the quality of the light source is that of daylight, and also a special negative setup in which the quality is that of high efficiency tungsten. For each emulsion several strips were exposed under each condition. Likewise for each emulsion strips were developed for a series of times ranging from 4 to 20 minutes, using a borax (D-76) type of developer. From a series of tests thus exposed and developed a family of H and D curves was constructed from which it was then possible to determine the time-gamma curve. From this curve the necessary development data were deduced.

In any comparison of negative type emulsions it is logical to consider as important those tests developed to equal and normal negative control gammas. This by no means implies that the development time is constant or the same because each type of negative film usually differs in its development characteristics. In Figure 1 are shown two sensitometric curves, one each for Super-sensitive and Super X negatives. These curves are shown for the same gamma, that is, .68, and represent actual experimental data. While an analysis of the tests made with the daylight and tungsten setups shows some difference, it is not necessary here to make any distinction between these two modes of exposure. The curves in Figure 1, therefore, are quite representative of the speed at equal gammas between these two emulsions when developed in a borax type developer. As these curves are plotted on the same axes, the displacement of one curve from the other gives a definite indication of the speed ratio between them. In this instance there is approximately a 90% speed increase shown

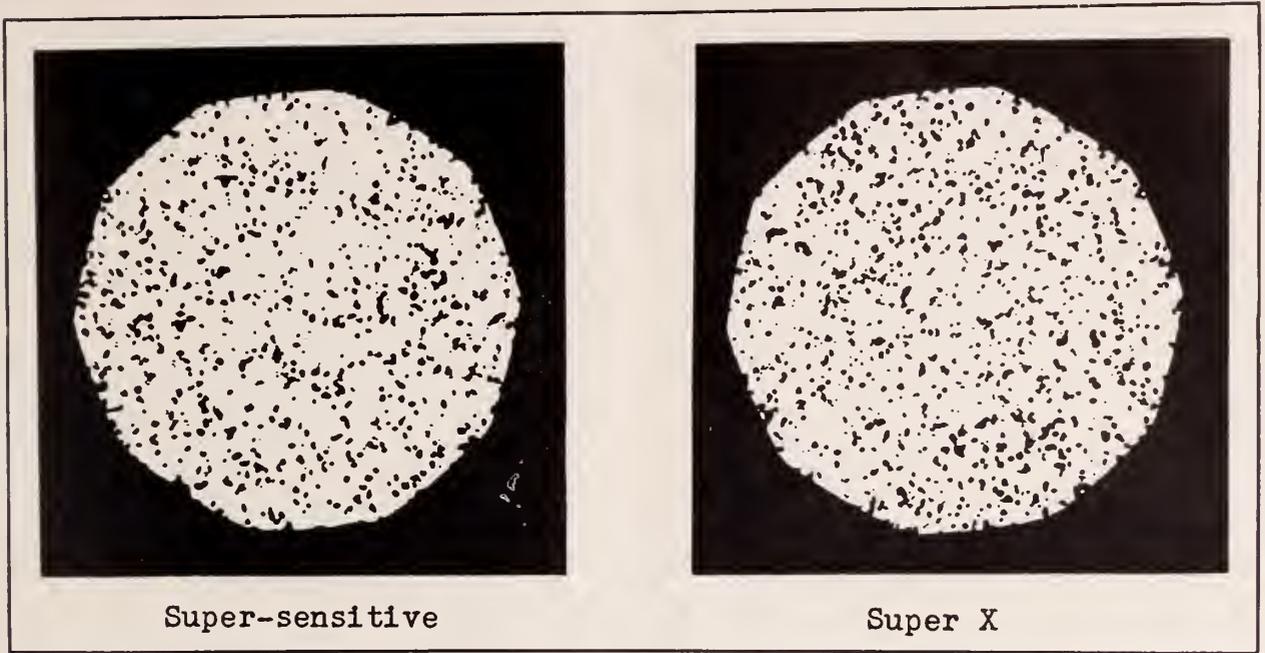


Fig. 3

for the Super X negative over the Super-sensitive. Before leaving this point we should like to reiterate that inasmuch as the Super X negative is of an inherently lower contrast than Super-sensitive, it stands to reason that the development time on the new film should be longer than that on the Super-sensitive. A fair comparison of speed between any two emulsions can only be made when both emulsions are developed to the same gamma. If the Super X negative is developed for the same time as Super-sensitive it will be relatively under developed and sensitometrically it will show an appreciably lower gamma. It is not to be expected, therefore, that the speed differential quoted above would hold for a condition of equal development times but it will be found to hold provided each emulsion is developed to the same gamma irrespective of the times of development required to do this. This is definitely proven by the data contained in Figure 1.

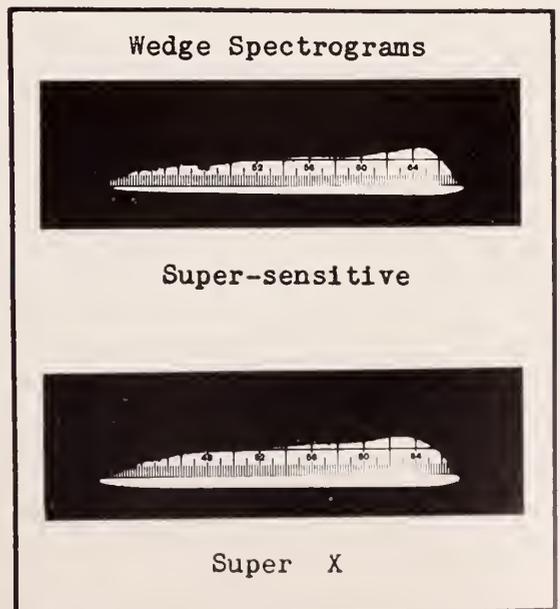
The times of development necessary to produce curves of equal gamma on each type of film are indicated in Figure 2. It will be observed that in general the development characteristic of the Super X negative is quite different from that of Super-sensitive. Although by the mode of development employed in these tests a difference of approximately 4 minutes was found necessary, it does not imply that this same time ratio would hold in different types of developing machines or with different negative formulas. Practically every motion picture laboratory makes use of a borax type formula but the standard D-76 formula is somewhat modified to satisfy the requirements of the different types of developing machines. Tests made at various laboratories show that the Super X negative requires from 1½ to 3 minutes more development time than the Super-sensitive to obtain the same gamma. It is quite well known that any pair of negative emulsions will show slight differences in both speed and development ratios, dependent upon the actual developer formula and developing machine employed.

Another point which is very necessary to establish is that of graininess. One normally has the right to expect that with higher speed emulsions, larger grain size occurs. In the case of Super X film, however, this is not the case. In Figure 3 are shown photomicrograms of the two types of film, the originals of which were made at 435X

magnification from areas of equal densities on the two films each developed to the same gamma. A careful analysis of the two photomicrograms shows the Super X negative quite similar to Super-sensitive, although many observers have picked the Super X negative as showing slightly finer grain than the Super-sensitive. The difference between them, however, is quite small and probably is discernible on the screen only upon careful examination. The main point to establish, however, is the fact that the Super X negative, although approximately twice the speed of Super-sensitive at the same gamma, does not show any increase in grain size. This is one feature in which the Super X film is an outstanding product.

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Fig. 4





Corrective Makeup As an Aid to Cinematography

by

Perc Westmore

President, Motion Picture Makeup Artists' Association,
Director of Makeup, Warner Brothers'-First
National Studios

EVER since the first crank turned, cinematographers and Makeup Artists have been comparing makeup to retouching in 'still' portraiture. The comparison is a good one, but we've made it inaccurate: in retouching, both the contour and the texture of the facial areas are rendered more pleasing; in conventional makeup, we deal almost exclusively with complexion and texture, leaving the modelling of objectionable contours almost entirely to the cinematographer and his lights. That is all well enough, for cinematographers can, by painting with light and shade, modify facial contours, accentuating good features and concealing or minimizing bad ones, to a remarkable extent. But since makeup can, as has been proven, aid the cinematographer in modifying facial textures, would it not be even better for the makeup artist to aid him even more by correcting objectionable contours?

We have answered the question with a vigorous af-

firmative. Within the past year, we have put into practice at the Warner Brothers' studios a new system of makeup which we call "Corrective Makeup." With it, we have been able to simplify the work of the cinematographer, and to greatly enhance the facial attractiveness of our stars. In some instances, we have virtually remodelled famous faces; in others, we have, so to speak, salvaged budding starlets from the obscurity which often waits for players—however promising—who "don't photograph well."

We simply apply to makeup the same basic principles by which cinematographers model faces with lighting: highlighting places that are undesirably recessed or concave, shadowing unpleasant protuberances. This is not done with liners or obvious tricks of coloration, but by carefully-planned use of different shades of regular grease-point.

Perhaps the best illustration of the method would be to follow the course of treatment given to a new player before she starts her first production on our lot. First of all, we study the player's face, as well as her portraits, in order to get a preliminary idea of the corrections we are to make. Next, we find out what type of makeup she has previously worn, and determine what is to be the basic shade of her new makeup.

At this point, the creative part of corrective makeup begins. Let us say that the lady has a face that is too round and full for our purpose, especially around the cheeks and chin; her nose is rather broad and flat; her lips are larger than we care for; her chin shows a pronounced dimple, and there are little hollows at the corner of her mouth which detract from the youthful effect. In addition, her eyes are so blue that they will appear 'washed out' on the screen.

Paint No. 1 is, of course, to slenderize her face. This is done by using grease-point several shades darker than the base makeup, and applying it at the hair-line, and under the chin—exactly as a good cinematographer would strive to maintain shadows in these same areas. Suppose the basic shade is a No. 25 grease-point: these shadows might be painted with No. 29. The broad nose would be thinned by highlighting the ridge with a lighter paint—say No. 22—and shadowing the walls of the nose with a darker shade—perhaps No. 27.

The lips, of course, would be remodelled by applying lip-r rouge to the desired shape and size, and extending the ground color to meet the new lip-line.

The dimple, and the hollows at the corners of the mouth, would be lightened by using a grease-point lighter than the basic ground shade—let us say No. 23.

The eyes, in addition to being accentuated in much the usual manner, would be darkened by placing a spot of red in the corners, where it would cause little dark catch-lights in the iris. In this connection, it may be interesting to note that natural eyebrows are the rule of our studio; plucked eyebrows are strictly taboo, not only because of their unnatural appearance, but because of their effect on the lines and contours of the face.

Once this makeup has been evolved, a detailed sketch of the player's face is made, indicating exactly the areas treated correctively, and specifying the exact shades used in each place, as well as the basic makeup shade. This is given a "Case Number," exactly as a doctor might enumerate his patients, and filed, together with a photograph of the corrective makeup, in the Makeup Department's files.

It should be understood, of course, that these corrective makeups are rigidly adhered to, and that they are applied, not by the player herself, but by the studio's makeup

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John Arnold Starts Fifth Term As A.S.C. Head

IN AN unparalleled tribute to the leadership which for four years guided the organization through its most trying and change-filled period, John Arnold was unanimously re-elected President of the American Society of Cinematographers at the Society's annual election, and launched upon his fifth successive term as the organization's Chief Executive.

Victor Milner was re-elected First Vice-President; James C. Van Trees became Second Vice-President, and Charles B. Lang, Jr., Third Vice-President. Fred W. Jackman was elected Treasurer of the Society, and Frank B. Good retained the office of Secretary. Of these, both Van Trees and Jackman are former Presidents of the Organization. John W. Boyle, Elmer G. Dyer, A. L. Gilks, Charles Lang and Joseph Walker were elected to serve three-year terms as members of the Board of Governors.

Commenting upon his re-election, President Arnold said, "I hardly need to say that I feel highly honored by this expression of confidence in my administration: such a tribute is not lightly to be forgotten. But it is far too impressive to be taken in a purely personal sense; rather, it is an expression of confidence in the sincerity and integrity of the Administration as a whole. What we have thus far been able to accomplish has not been due to the efforts of any one man, or of two or three, but to the concerted and unwavering loyalty and unstinted labor of the entire board. Due to this spirit of unity, we have been able to accomplish much in the past, and with it, we are sure to achieve even more in the future.

"The year just past has been a period of reorganization, of cementing the foundations previously laid. A year ago, we were just completing an unparalleled expansion of the Society's membership and activities. Since then, we have striven to consolidate our gains—to mould our organization into the form best suited to its purpose of serving cameramen, individually and collectively. In this, we have exceeded our fondest hopes, for the A.S.C. now stands as a monument to the ideal that the relations between Cinematographers and Producers can be maintained on a basis of harmony and fair-play. We have made this ideal an actual fact whose existence has directly benefited every member of the camera profession. Viewed collectively, the working conditions of Cinematographers are better today than they have ever before been; employment is attaining higher peaks, with more work for more men more



John
Arnold,
A.S.C.

consistently. Fewer restrictions hedge the members of our craft, and many detailed improvements are noticeable, affecting every group and classification.

"Moreover, innumerable individual benefits have accrued. These have not been proclaimed with a fanfare of publicity, but the concrete results of the cooperation now existing between the Society and the Producers have been manifested repeatedly.

"My platform for the future remains exactly as it was five years ago: I pledge myself and my associates to bend every effort for the betterment of Cameramen. We dedicate ourselves to advancing the interests of our craft, adhering always to the ideals of loyalty, sincerity and justice which have thus far crowned our labors with such success. No member of the administration receives any remuneration for his services; and we refuse to tolerate the use of any office in the Society for personal gain or advancement.

"The period of expansion and reorganization is largely over. The future holds steadily increasing promise for the A.S.C. and its members. The work of the Board, the Officers and the Executive Committee for the economic benefit of the members is now thoroughly understood, and proceeding with perfect precision. The cultural and social activities of the Society are being resumed with increased energy, for we have no intention of losing sight of the importance of keeping our members abreast of the professional and technical advances of the day. The American Society of Cinematographers has always been first to investigate every new development, and to afford to its members the latest and most authentic information on all such advances, and it will continue to do so.

"It has never been my way, however, to offer words where actions are more eloquent: therefore, I say, as I said when I first took office, that my administration will speak with results—not promises. Results are the criterion

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Ray June, A.S.C.

Mood Must Be Predominating Effect Says June

by

James L. FritzFormerly Dramatic Editor St. Louis Post-Dispatch
and New York Daily News

WHEN trying to discover the one quality which Ray June strives to inject into his work, we must take into consideration that June does not look to any one effect, but to all of the vital qualities which go to making the product of the present day cinematographer a thing of beauty and perfection. On the other hand, June tells us that although he constantly strives for all of these qualities, it is the mood to which he gives particular attention. Because, when the cinematographer succeeds in transplating his feeling of the mood of the subject, he then automatically succeeds in projecting these other qualities onto that thin strip of celluloid, which becomes a reproduction of life in the theater.

To obtain the proper mood of any story or subject, the cinematographer must first understand and obtain the coincidence of lighting and the blending of shadows with the true perspective of the story and subject. It is for this reason that Ray June prefers to work on musical comedies

and light melodramas. In these types of productions, the cinematographer is allowed a greater scope in his interpretations of moods. The undercurrent and mood of the subjects are ever-changing, and the fast moving trend of the story told in these pictures, never allows the subject to lapse into a dull, drab monotone.

When striving constantly for the proper mood, June believes that the cinematographer cannot escape humanism in his work. The bleakness of loneliness is not to be endured in motion pictures. If man is absent in the subject, then consciousness and life are there, somehow. If the idiom of today has been utilized, we may all read in our common language, an unblurred message in every cinematographic interpretation. There is no reason why this should not appeal to the masses. In the tastes of the many, is a fund of detail, suitable for expression on any subject which could be conjured in the mind. Detail, it is true, is valuable to remind us that we walk upon the soil; but the real true greatness resides in unrelated detail. Here, the cinematographer shows his greatest ability in creating originality.

Originality in a cinematographic product is not only necessary and vital, but it is stimulating to the minds of the audience. It is because of originality in the interpretation of the moods of the story and subject, that the cinematographer and motion pictures have risen to the category of masters who create masterpieces of beauty, entertainment, and vitality. Originality should not seem impossible. It is a basic need to the furtherance of motion pictures. Only the creative mind with superlative technique, can make an ordinary idea seem vivid and fresh. A mass of buttons or a few greasy cog-wheels could scarcely be termed as subjects which afford a great amount of originality, yet, originality in the treatment of these subjects cannot only make them interesting, but a vital thing to the endurance of the subject. Originality obtained through the proper interpretation of the mood, may be engendered by dissipating the fantasies of imaginativeness, criticism and composition to a vitalic interest.

Another point in the obtaining of originality and the interpretation of the mood, is the understanding of rhythm. Rhythm in cinematography is as necessary as rhythm in music. After the cinematographer has developed a sense of it, he feels the sway, the movement and the pulsations that run as an undercurrent in the story. It may be the honey-sweet swaying of a Chopin waltz, or it may have the stirring quality of a Mendelssohn composition and then there may be the hard sophisticated crash of jazz, but whatever the rhythm contained in the story and subject, the understanding and feel of it, on the part of the cinematographer, is vital to the true interpretation of the mood.

Even the weak and trivial subjects have interests and values that the traditional arts leave untouched. Music alone, has heretofore represented movement through time, but the motion picture synthesizes movement through both time and space and the very fact that it can co-ordinate visual images, with sound, and releases both of these elements from the boundaries of apparent space and a fixed location, it contributes something to our picture of the world, not given completely in direct experience. June tells us that the cinematographer, by utilizing his daily experience of motion, can re-create a symbolic form, a world that is otherwise beyond the direct perception or grasp. Without any conscious notion of its destination, the product of the cinematographer presents us with a world of interpenetrating, counter-influencing organisms; and it enables

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Don't Show Them Everything ... Is Arthur Miller's Policy

by
Harry Burdick



Arthur Miller, A.S.C.

WHILE Arthur Miller was lensing his current cinematographic work "Black Sheep," a singular circumstance interrupted the smooth, rapid flow of scenes from stage to film. The immediate and ingenious solution is an illuminating instance of the cinematographer's far-extending contribution to contemporary motion picture production, based on his deep-seated knowledge of the mechanics of his profession.

Most of the footage comprising this screen offering depicts action aboard an ocean liner at sea. Studio sets were used, of course. One scene called for an extreme long shot embracing the ship's promenade deck, two hundred and twenty feet in length.

The lighting demands were interesting. All light must enter from one side, simulating the brilliance of reflections from the water. With the camera ready to grind, it was abruptly realized that a ship plowing through sea has a natural roll. How to achieve this effect? The set was built on the solid studio floor. Rocking the camera didn't answer.

So Miller dug down in his bag of light legerdemain. He had no top lighting; it was all side lighting. He mounted his lights on hastily constructed see-saw devices. A small army of electricians was recruited. They pushed down in unison. The lights were elevated. Releasing their pressure, the lights descended. Against the scene's entire two hundred and twenty feet the light rose and fell with rhythmic regularity—and far all the world, that ship was gently rolling against the sea's mirrored glitter.

Further display of Miller's resourcefulness emanating from his thorough comprehension of cinematographic technicalities was manifest during the shooting of his "White Parade," one of last year's outstanding photographic successes. A scene included the hospital nursery containing fourteen practically brand-new babies, each but forty-eight hours of age. Strong light is not for eyes of so brief existence.

Miller went into a close huddle with his laboratory chief. Then he lighted the scene in a very low key, the laboratory forced development of the negative and on the screen it appeared bathed in light. Nary an infant blinked or squinted.

Out of Miller's quarter-century experience with motion picture cameras, he has evolved a definite philosophy of

cinematography. The advent of sound strengthened it. Voltaire wrote, "The secret of wearying your reader is to tell him everything." Miller paraphrases it, "The secret of wearying your audience is to show him everything."

He is ever acutely aware that audiences have imagination. He plays to that mass imagination. Never is his screen crammed with vivid detailed depiction. He reveals just enough, not a fraction more—and makes the audience put its imagination into play.

Nowadays, he feels, the audience sees and hears everything that a projectionist can toss into the theater. It becomes satiated with the fullness of the fare. Nothing remains but for the audience to sit there and take it.

Miller might be termed a repressionist, for he has mastered that most difficult of all arts—the beauty, dignity and cultured charm of leaving things untold and of knowing what things to leave untold. It takes courage to stop, just in time. It requires utter confidence in the adequacy of one's vehicle of expression to avoid the so-common trait of redundancy.

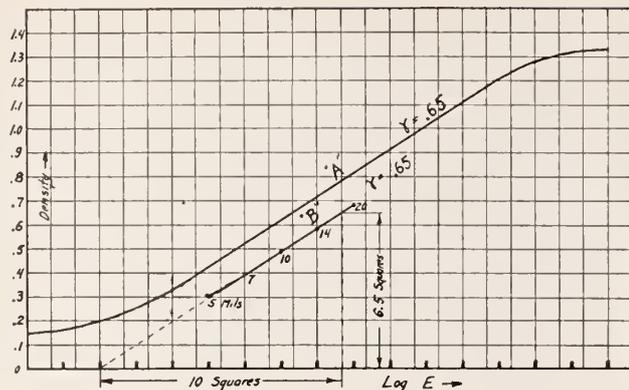
Besides, Miller believes the audience enjoys exercising its imagination—of attributing to characters on the screen qualities of its own preference.

Miller subscribes to the creed that men and women, and children, too, go into motion picture exhibition halls to escape from themselves. They seek entertainment in the land of make-believe for an hour or two. So he strives, deliberately and with malice aforethought, to cause them imaginatively to participate in the actions screened before their vision.

He wants them to imagine themselves in the hero's or the heroine's position and to experience within themselves the drama that unfolds. He fails of this purpose, he avers, if he engraves on the screen a cold-cut, sharp-edged scene so ample in detail that nothing remains for the audience but to gaze with stifled imagination. Remembering always there is a sound track bearing dialogue that fills every crevice not already covered.

He believes that despite the pushed-back horizons which sound has introduced in picture production it is pri-

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Glow-Lamp Sensitometry

by

Glenn H. Dorsey

Engineer, Hollywood Motion Picture Equipment Co., Ltd.

IN SEARCHING for some way to make it easier for the small laboratories to process glow-lamp recording, we have settled on the expedient of using the glow-lamp itself to print the sensitometric strip. The method is extremely simple and requires no extra equipment other than the densitometer which is part of every laboratory. We will even show how that over-all gamma may be checked by those laboratories whose equipment does not even include a densitometer.

Countless measurements and experiments extending over a period of several months have proved to us conclusively that the high voltage glow-lamps which we use and supply with our sound recording equipment have a light intensity versus current curve which is absolutely linear. That is to say doubling the milliamperes of current thru the glow-lamp will exactly double the light intensity emitted by it. Now that this important fact has been established and proved, we will show how it can be used to make the sensitometric strip.

A short review of the sensitometer as built by Eastman Kodak Company is now in order. This is a machine containing a light source and revolving drum type shutter. When the shutter is tripped it makes one revolution, exposing the film thru this drum shutter which has graduated steps cut in it. Each step printed is exposed 1.41 (or $\sqrt{2}$) times as long as the preceding lighter one. Every other step is therefore exposed twice as long as the second one preceding it. When this strip is developed and the density of each step plotted on graduated paper, the gamma of that batch of emulsion in that particular developer soup at the same time, temperature, and agitation is available. Please note—only that emulsion in that same developer or strength developer with the same time, temperature, and agitation. In the Hollywood laboratories it is the usual

practice to print a sensitometric strip on the end of each roll of sound track negative.

Now we take our glow-lamp recorder and make short pieces of unmodulated film. One at 5 mils, one at 7 mils (7.05 mils is 1.41×5), 10 mils, 14.1 mils, and 20 mils. The next steps would be 28.2 and 40 mils, but they are beyond the range of the usual 25 MA meter used on recording amplifiers. This film you develop at the standard time, temperature, and etc. used at your laboratory for developing sound track negative. The density of each piece of track is then measured on a densitometer. It is best to make several readings on each test piece and to strike an average for that piece.

In the absence of regular sensitometric printed paper any square ruled paper may be used. Say the paper you have is ruled in $\frac{1}{2}$ -inch squares. Starting from the bottom of the paper each square will be .10 points of density, running from 0 to 1.00 at 5 inches from the bottom. Along the bottom of the paper mark off every $1\frac{1}{2}$ squares or every $\frac{3}{4}$ inch.

The measured densities of the test film are next plotted against the log of the exposure. And since each step of our exposure is $\sqrt{2}$ times the preceding one, eliminating the necessity of using log tables, our exposure steps will each fall the same distance apart along the base, at the $\frac{3}{4}$ -inch intervals. Our series of points should fall like those in the illustration marked "B." Note that the lower two points are flattening out, showing the "toe," or region of underexposure of the film. Notice how this toe corresponds to that on curve "A," made from a regular sensitometric strip printed on the same piece of film. If a straight line is drawn thru the upper part of the series, we get a curve representing the gamma or contrast of this film and developer. Continue this line across the paper and count the squares height of the triangle for a base length of 10 squares, or 5 inches. The height of this triangle is the direct value gamma of this test.

Gamma is defined as the resultant density range divided by the log of the exposure range. It could also be expressed as the tangent of the angle the straight line portion forms with the base line. Reduced to simple grammar, it is the mathematical expression for the film contrast obtained from a scale of given exposures in a given developer.

If short pieces of these tests are spliced together, printed at a constant printer light, and then developed at your standard print time and temperature, the transmission percentages of the print should match the original exposures. That is to say, every other step should pass twice as much light as the second one preceding it for an over-all gamma of 1.00. The standard Hollywood practice is to have an over-all gamma of from 1.05 to 1.10, to allow for printer and projector losses.

Normally in glow-lamp recording the 5 mil unmodulated track is developed to 50% transmission, or .30 density. If gamma tests show that the negative must be developed to a gamma higher than .70 to reach this density, one of two things is at fault. The glow tube may be losing its actinic light emission. When viewed in subdued light its color should be pure blue, a pink or reddish cast denotes old age or abuse. Examination of the end of the tube in sunlight may show a yellow tinge on the tip, this shows that the tube has been used at current densities of 20 mils or over, sputtering the electrodes onto the glass. This yellow tinge acts as a yellow filter in front of the blue glow-light, cutting its output of actinic light as much as 80% in some cases. Or, if the glow-lamp appears in

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SOME

FAST "PANS"

"Weep No More!"

● M.G.M. furnishes its comero cronkers with a very chorming woiling wall in the person of Miss H. Gosson, secretary to Johnny Arnold. Since she took over the duty of lending her shopely shoulders to woeful winders of de ole block box, she has listened to over 500 confidential toles of woe. She gets on averge of three a doy. Len Smith has the best score to dote. He has seen her every doy for the post 9 months. (Moyb it's heart trouble.)

"The Lemon King"

● The best time to plant lemon trees is in a very hord rain. We can be sure of it, because Art Todd is on outhority on lemons. (For those who don't know what a lemon is . . . It is the citrus fruit with that yellow peel you find in high-bolls) . . . We met Art on the set ond asked him how he loked the rainy spell.

"Just fine," he sniveled, "I spedt do whole timb out on by ranch blonting lebon trees," he grinned at us and nodded hoppily. "Yes, sir, I had da bes' timb . . . I blonted biles od biles od biles of lebon trees" . . . We left Art before he could get enough wind to go on (the old adoge that camero men don't hove to be crazy . . . but it helps, seems to be proving out.)

"Wan't You Sit Down, Tany?"

● AS SOON as Tony Gaudio finishes the lost shot on his current picture for Worner Bros., he is going to visit friends in Texas where he will do a little plain and fancy bronco bustin' . . . well, at least he is going to learn to ride a horse.

"Maybe It's News"

● Flosch . . . Stockholm, Sweden . . . Aktb., Svenek Fil-industri (you pronounce it . . . I wonder how the proof reoder is going to know if this is spelled right) hos just erected its thirteenth cinemo house. The gigontic structure will occommodate 800 people . . . (imagine that) and it is the largest theater in Stockholm. (so you see, not that it motters, but they hove press ogents in Sweden.)....

"Local Boy Makes Good"

● FRANK BURGESS proved to those who would be interested that he hos the mokin's of a 'tops' film feeder, when he received an honorary membership to the 8mm Club on the merit of a super colossal 8mm (Mammoth Movie) he recently ground out . . . The Tiny Tintype is veddy veddy original in its composition, ond Frankie deserves lotso congrots . . . A tip to the 'ole' Acd'y Moom Pitcher Arts Etc . . . Better brush off 'dot ole Award' for little Frankie in 1935 . . .

"Dan't Tell Mrs. Cinematographer"

● OLLIE MARSH looks just too, too sweet in his pink bungalow opron. His wife, who has been very ill for the past several doys (we're really sorry, Ollie) hos been unable to leave her bed, so our hero has been playing nurse-moid to the two children, learned to cook, ond tells us that if his

flutter half is incapacitated much longer, he will hove become a proficient seamstress ond will develop house-moid's knee.

"Hair, Hair!"

● HAROLD MARZORATI is hoiring oll sorts of ribs these beautiful days . . . (the Chomber of Commerce gove me five bucks to soy that). It seems that Horold purchased a new brand of hoir tonic which hod directions odvising use every three hours . . . well, Horold, who is a stickler for directions, forgot where he was ond pulled the bottle out while on the set and began dousing his slightly bald head . . . now he's losing more hoir worrying about how he's ever going to live it down.

"The Van Trees Are a Bit Puffed Up"

● JIM VAN TREES, the elder, caught the one that didn't get away . . . he is praudly showing friends a snop-shot of a 28½-inch steel head trout which he caught lost week end in the Sespe . . . (we hove the picture . . . Ho, Ho) ond Jim, Jr., is showing the some friends a picture of a mole bundle from heaven with which his income tax exemption presented him. You can't tell which of the Jims is

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James L. Van Trees, Director of Photography, member of the American Society of Cinematographers and fisherman extraordinary.





PHOTOGRAPHY

of the MONTH

"CHASING YESTERDAY" (Radio)

Lucien Andriot, A.S.C.: Directing Cinematographer

Hollywood Reporter (March 21, 1935): "For its good points the picture has unusually fine photography by Lucien Andriot——."

Daily Variety (March 21, 1935): "Meritorious contributions are also made by Lucien Andriot's appropriate photography——."

"A NIGHT AT THE RITZ" (Warners)

James Van Trees, A.S.C.: Directing Cinematographer

Hollywood Reporter (March 22, 1935): "Photography is okay."

Daily Variety (March 22, 1935): "Picture has been well photographed——."

"DEATH FLIES EAST" (Columbia)

Al Siegler, A.S.C.: Directing Cinematographer

Hollywood Reporter (March 22, 1935): "——and Siegler's photography is good."

"STAR OF MIDNIGHT" (RKO)

J. Roy Hunt, A.S.C.: Directing Cinematographer

Daily Variety (March 25, 1935): "Photography of J. Roy Hunt is excellent."

Hollywood Reporter (March 25, 1935): "Photography is first class."

"IT'S A SMALL WORLD" (Fox)

Arthur Miller, A.S.C.: Directing Cinematographer

Daily Variety (March 25, 1935): "Arthur Miller's photography is especially well adapted to the type of material."

Hollywood Reporter (March 25, 1935): "Photography is well abreast of the picture's requirements."

"STOLEN HARMONY" (Paramount)

Harry Fischbeck, A.S.C.: Directing Cinematographer

Daily Variety (March 26, 1935): "Photography of Harry Fischbeck is exceptionally good."

Hollywood Reporter (March 30, 1935): "Photography generally is good with some tricky dissolves that really help the action."

"LES MISERABLES" (United Artists)

Gregg Toland, A.S.C.: Directing Cinematographer

Hollywood Reporter (March 30, 1935): "This effect is further carried out by the exquisite photography by Gregg Toland. He has captured each moment as though it were a painting in movement and his close-ups are portrait-like."

Daily Variety (March 30, 1935): "Gregg Toland's photography is of exceptional merit. He uses the camera intelligently and in some episodes with positive inspiration to emphasize the spiritual phases of the drama."

"RECKLESS" (M-G-M)

George Folsay, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 1, 1935): "The photography by George Folsay is beautiful."

Daily Variety (April 1, 1935): "Photography of George Folsay is excellent."

"THE HOOSIER SCHOOLMASTER" (Monogram)

Harry Neumann, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 2, 1935): "Harry Neumann's photography will make any part of 'The Hoosier Schoolmaster' easy to watch."

Daily Variety (April 2, 1935): "Harry Neumann has done a top-notch job with his camera."

Film Daily (April 9, 1935): "Photography 'Very good.'"

"THE FLORENTINE DAGGER" (Warner Bros.)

Arthur Todd, A.S.C.: Directing Cinematographer

Daily Variety (April 5, 1935): "Arthur Todd handles his camera effectively."

"SPRING TONIC" (Fox)

L. W. O'Connell, A.S.C.: Directing Cinematographer

Daily Variety (April 5, 1935): "Photography is okay."

"THE UNWELCOME STRANGER"

John Stumar, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 8, 1935): "Photography is good."

Daily Variety (April 12, 1935): "John Stumar has contributed some corking good photography, particularly the shots of Searl astride a fast-moving horse."

"PARTY WIRE" (Columbia)

Al Siegler, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 11, 1935): "Al Siegler's photography is gorgeous."

Daily Variety (April 11, 1935): "Photography is good."

"THE CASE OF THE CURIOUS BRIDE" (Warner Bros.)

Dave Abel, A.S.C.: Directing Cinematographer

Daily Variety (April 12, 1935): "Dave Abel has done a good job with the camera."

"DOUBTING THOMAS" (Fox)

Joseph Valentine, A.S.C.: Directing Cinematographer

Daily Variety (April 12, 1935): "Photography is standard."

"EIGHT BELLS" (Columbia)

Joseph Walker, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 12, 1935): "Joseph Walker's photography is very fine."

Daily Variety (April 13, 1935): "——which the excellent photography by Joseph Walker does much to enhance."

"G-MEN" (Warner Bros.)

Sol Polita, A.S.C.: Directing Cinematographer

Daily Variety (April 17, 1935): "Photography by Sol Polita adds much to the picture."

(Continued on Page 200)

FASTER

MUCH faster than regular Eastman Super Sensitive "Pan" under tungsten light. Faster even than that famous film is when *hypersensitized*. That is half of the news about Eastman Super X Panchromatic Negative. The other half: Eastman Super X shows no increase in grain size over Super Sensitive "Pan". . . in fact, the tremendous gain in speed has been achieved without sacrificing or impairing any valuable characteristic. . . . You are invited to investigate the most striking film improvement since the advent of the first Eastman Super Sensitive emulsion. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

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PANCHROMATIC NEGATIVE

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If your camera is running 8 times normal how long will it take to expose 400 feet of film?

If your camera is running 4 times normal how many feet of film will you expose in 55 seconds?

If F 2.3 is the correct lens stop for 24 frames per second, what should the stop be for 48 frames per second?

If F 11.3 would be the right stop with the shutter set at 170 degrees, what would be the lens opening with the shutter at 40 degrees?

When is an 88 filter used and for what purpose?

What is the filter factor of a 5N5 filter for Eastman Film? For Dupont Film? For Agfa Film?

What is the fastest lens for 35mm cameras and who makes it?

How far from the camera would your subject have to be for a head close-up with a 100mm lens?

With a shooting light of F 6.3 and the camera shutter at 170 degrees, what would be the F value of the Akeley Camera with 280-degree shutter?

With a developing time of 8 minutes at 65 degrees, what would be the developing time with a temperature of 55 degrees?

These and hundreds of other questions are answered at a glance in the

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Eastman Super X Panchromatic Negative Motion Picture Film

(Continued from Page 187)

Another interesting feature of this new film is the fact that it differs very slightly from Super-sensitive negative in its color sensitivity characteristics. The Super X negative is of the general super-sensitive type of sensitizing and proof of the fact that it matches very closely the Super-sensitive film is obtained upon examination of the following table of filter factors. These factors were computed under identical sensitometric conditions for both films and were substantiated by actual camera exposures.

Comparative Filter Factors to Daylight

Filter	Super-sensitive	Super X
Aero 1	1.25	1.25
Aero 2	1.50	1.50
3N5	4	4
5N5	5	5
G	3	3
23A	3	4
25	4	5
58	6	6
47	6	5

In Figure 3 prints from wedge spectrograms are shown for each of the two negatives. It will be observed from these that the difference in color sensitivity is very slight.

As was indicated earlier in this article, samples of this film have been distributed to all types of departments using negative film in the motion picture industry. At the time of this writing, five weeks after its introduction, there are six feature pictures being made with this film. The screen results have been excellent and every cameraman using the film does so by his own choice and as the result of comparative tests between Super X and other types of negative materials. It is our feeling, therefore, that the practical results are definitely indicative of the quality of the film. Very successful results are also being obtained on this material in photographing, for example, actual night exteriors, miniature shots with high speed cameras, and projection background composite exposures.

Glow-Lamp Sensitometry

(Continued from Page 192)

good condition, the film you are using for recording stock may be of too slow speed. With the sound recording stock we are getting at present in Hollywood, it is necessary to pull the glow-lamp block 1/4 inch from the slit-block to avoid overexposing the film and with the shorter development necessary to control the density too low a gamma value is obtained.

Now for those laboratories without a densitometer. Make a test piece of film

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at 10 mils lamp current and another at 20 mils. These points are chosen arbitrarily because they should be safely up on the straight-line portion of the film H & D curve. Develop this neg the standard time you have been using for sound track negative. Print these two strips at the average printer light you have been using, then develop the print your average time for prints. Now if your over-all gamma is near 1.00 you

should be able to view a piece of print from the 10 mil track beside a piece of the 20 mil track print, folded double, with apparently the same density to the eye. If the doubled 20 mil track appears lighter than the 10 mil track the over-all gamma is more than 1.00, if darker, less than 1.00. The general practice is to have the over-all gamma slightly more than 1.00 to allow for recorder, printer, and projector losses.

Corrective Makeup as an Aid to Cinematography

(Continued from Page 188)

artists. Virtually every feminine player on the studio's contract list has her specially prescribed corrective makeup; and the same course is followed with players borrowed from other studios, or engaged for a single production. Regardless of the player's natural beauty, we have found that this system of makeup can be used to advantage, for even the most completely beautiful woman has some minor irregularities of contour which can be smoothed out in this fashion. The system can be applied with equal success to men, of course, but in practice, we rarely do so, as most of our male stars are of types which benefit by wearing little or no makeup.

In practice, we have found that this system of makeup, far from taking anything out of the cinematographer's control, has proven to be of very definite benefit to the men at the cameras. Our camera staff includes men who are as particular about makeup as any in the world: and they are unanimous in saying that our corrective system of makeup frees their mind of all worries about makeup, simplifies the detail work of personal lighting, and allows them to work more efficiently on any sort of production, from a program film to a "special."

This method can be applied equally well to character makeup; in fact, in several instances it has been used for this purpose. Jean Muir, for instance, in a recent dual role, utilized the system for one characterization, while playing her other part in her regular corrective makeup. Marion Davies, in her current production, "Page Miss Glory," is transformed by the same methods into a plain, unattractive servant. Applying the methods just explained, we made her eyes appear round and washed out, her mouth thin and straight, gave her a most convincing double chin, and created a remarkable pug nose. Not a bit of wax or nose-putty was used, nor a single eye-distorting strap; everything was done by painting upon her face a portrait in grease-paint.

And there, I believe, lies the secret of the whole thing; we are applying makeup, not as a mere covering for a flat sur-

face, but in exactly the same way a portrait painter uses oil paints to depict an apparently three-dimensional face on his flat canvas. Personally, I find my own early experience as a portrait-painter invaluable in this new interpretation of cosmetology. Moreover, I venture to say that such experience will prove absolutely essential when natural-color cinematography comes into its own, as it soon must. In that day, I venture to say that the only makeup artists who survive will be those who have had a thorough grounding in the art of brush and palette. Corrective makeup has been applied successfully to three-color Technicolor productions; and when we achieve completely perfected color cinematography, it will reach its highest development for then we will be dealing, not with the monochromatic values of the wash drawing, but the full glory of color. And our corrective makeup will then have to be applied as an artist would apply his paints, moulding the face in the most delicate nuances of tone and color.

Mood Must Be Predominating Effect Says June

(Continued from Page 190)

us to think about that world with a greater degree of concreteness. This, on the part of the cinematographer, is no small triumph in cultural assimilation. Through the utilization and understanding of these senses, the cinematographer is, in return, given a complete understanding of his camera, its possibilities and its perversions, its capacity for representing objects that interpenetrate, and ability of placing distant environments in immediate juxtaposition and finally to represent and reproduce subjective distortions and hallucinations. This understanding of the machine with which he is working, enables the cinematographer to interpret and capture the moods of his subjects.

These developments in the mind of the cinematographer, are perhaps the fine psychological reason that they, more than anyone else, are able to un-

John Arnold Starts Fifth Term As A.S.C. Head

(Continued from Page 189)

by which I judge, and by which I wish to be judged."

First Vice-President Milner's comment is, "The success of the present administration speaks for itself. We have brought a new spirit into the relations between the Cinematographer and his employer—one of fairness to both sides, of friendliness and cooperation. We will continue this, and bend every effort to keep the Cinematographer now, as ever before, in the forefront of progress. We have minimized the economic problems confronting our craft, and we stand ready to apply the same energy to solving the many technical and artistic problems envisioned in the future."

Past-President Fred Jockman, accepting his election as Treasurer, remarked, "In every way, the condition of the Society and its members is immeasurably better than ever before. Financially, the A.S.C. stands today in a stronger position than at any time in its history. As Treasurer, my special interest will be to strive to keep it on an equally sound basis. Financially, as well as in other ways, the Society has in the past gone through very trying times; thus far, we

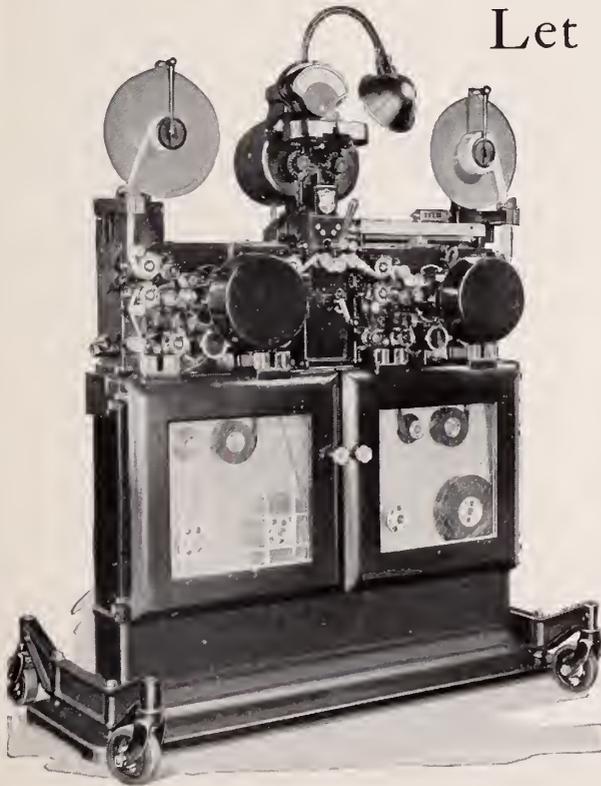
have successfully weathered every storm, though often only by heroic work and self-sacrifices. That I have today inherited a well-nourished treasury from my predecessor is clearly due to no accomplishment of mine; but I shall bend every effort to deliver the financial affairs of the Society to my successor in as healthy a condition as I have received them.

"The relations between the Camera-men and the Producers have never been on so practical a basis in the history of the Industry. Today, the two groups meet as equals, and attack their mutual problems as friends and co-workers, rather than as employer and employee. The results of this new relationship have been startlingly successful, and are assured of even greater success as time goes on.

"The individual condition of Cinematographers is equally improved. False restrictions which for so long fettered individual progress and stifled initiative have been abolished. In their place is a regime of strict justice and common-sense. Advancement, for example, so

derstood and visualize the moods and tempos embodied in the story and subject. Ordinarily, we skip over and schematize the objects which surround us in every day life. We relate them to some practical need or subordinate them to some immediate wish. The cinematographer recognizes them in an independent form, created by light, shade, and shadow. He restores to the eye, otherwise so preoccupied with the abstractions of dull existence, an enjoyment of things roundly seen. He, through his product, the motion pictures, gives significance to life's most remote symbols. His is a cult of pure form and segregated esthetic sensibility. The motion picture, with its close-ups, its synoptic views, its shifting events, its ever-present camera eye and its spatial forms, has gradually, since its beginning, developed into a reproduction of life. Vivid in its interpretation of the thrabbing undercurrent, the vital rhythm and the ever-changing moods, which are life. The cinematographic product has slowly gained in artistic significance, until, today, it stands as undeniable proof that the cinematographer, although he achieves this perfection with the use of a machine, is as truly an artist as any master of the brush.

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long almost impossible, is once more open to those who deserve it. Merit, common-sense and fairness rule.

"As to the future, it does not take a prophet to foresee that this new spirit is bringing better things for every member of the profession. With both cut-

throat competition and unnecessary regimentation abolished, and a new spirit of sincere cooperation ruling inside and outside of the Society, the A.S.C. must inevitably progress to new and better conditions for both the organization and its individual members."

DON'T SHOW THEM EVERYTHING

(Continued from Page 191)

marily a moving picture that he is making. He believes that all the proven principles of cinematography that obtained in the silent days are still too valuable to go unused merely because there is dialogue to help carry the entertainment load.

Fundamentals of dramatic expression by lens and film should not be slighted just because there is a handy crutch in the form of accompanying dialogue. So he puts forth all his ability to convey pictorially every ounce of drama every scene contains. He wants to contribute his full share to the finished entertainment. He knows the sound engineers will do theirs.

And he's not above taking artistic license to achieve his full quota of dramatic effect. Hospital operating rooms, as instance, are skillfully lighted. They are all light, with no shadows to annoy deft surgeons.

They are appointed in cold, scientific efficiency. They actually are settings exuding about the same degree of drama as any other sort of impersonal working place. Yet in his "White Parade" his surgery scenes fairly throb with full-throated drama. He puts deep shadows where no shadows ever existed. He cloaks the cold details so glaringly present in actuality with a mystery that stimulates imagination. And a fierce light beats down on the operative field, focusing dramatic attention to a concentrated spot. It is an intensely gripping scene. Miller made it so. He knows to an amazing degree just how little to reveal; the dramatic worth of simplicity.

Many of the noteworthy effects he gains can be traced directly to his full knowledge of the chemistry that is cine-

matography. His early years were in that era when studios were built around laboratories and the cinematographer took his pictures, developed his negative and made his own prints. He has kept that intimate contact with laboratory practice. In fact, he has a private laboratory at his home. And at the studio, his closest collaborator is his laboratory chief.

Because of this processing intimacy, he is usually allotted the task of trying out new practices or determining the merit of proposed improvements in material or procedure. His "Block Sheep," for example is the first picture to be shot on the new Eastman Super negative. For your information, he reports it easier to use, requiring fewer lights, faster, giving a noticeably better rendition, particularly in greens and shadows. Sets are easier to light. It lessens light strain on actors and in many cases, particularly with children, makes possible effects not obtainable under heavy light pressure.

Photography of the Month

(Continued from Page 194)

Hollywood Reporter (April 17, 1935):
 "—but Polito's photography is A1."

"THE DARING YOUNG MAN" (Fox)
Merritt Gerstad, A.S.C.: Directing Cinematographer

Daily Variety (April 17, 1935): "Photography is good."

Hollywood Reporter (April 17, 1935):
 "Photography up to standard."

"GEORGE WHITE SCANDALS" (Fox)
George Schneiderman, A.S.C.: Directing Cinematographer

Daily Variety (March 26, 1935): "Photography of George Schneiderman is excellent."

"BLACK FURY" (First National)
Byron Haskin, A.S.C.: Directing Cinematographer

Daily Variety (March 26, 1935): "Byron Haskin has handled his camera with power and artistry."

Hollywood Reporter (March 26, 1935):
 "The photography by Byron Haskin has plenty to do with the success of the picture."



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"MISTER DYNAMITE" (Universal)

George Robinsan, A.S.C.: Directing Cinematographer
 Daily Variety (March 28, 1935): "Photography throughout, handled by George Robinsan, was excellent."
 Hollywood Reporter (March 28, 1935): "Photography and production top-notch."

"PEOPLE WILL TALK" (Paramount)

Alfred Gilks, A.S.C.: Directing Cinematographer
 Hollywood Reporter (March 28, 1935): "Photography by Alfred Gilks is very good."
 Daily Variety (March 28, 1935): "Alfred Gilks' photography is uniformly good."

"VAGABOND LADY" (M-G-M-Rauch)

Jock MacKenzie, A.S.C.: Directing Cinematographer
 Hollywood Reporter (March 28, 1935): "Photography is first rate."
 Daily Variety (March 28, 1935): "Jack MacKenzie's camera is well handled."

"FOUR HOURS TO KILL" (Paramount)

Theodor Sparkuhl, A.S.C.: Directing Cinematographer
 Hollywood Reporter (March 29, 1935): "And add to all that the fine photography by Theodor Sparkuhl — where has this master been all these years?"
 Daily Variety (March 29, 1935): "Theodor Sparkuhl uses his camera splendidly."

SOME FAST "PANS"

(Continued from Page 193)

the proudest. Jim, Jr., tells us that soon there will be three shutter openers and closers in the family.

"Shodes of Admirol Byrd"

● **CLYDE DeVINNA** seems to be a short wave D.C., however, Clyde's hobby or mania, as the case may be, has proved to be a great help on previous pictures on far off locations. At present, he has just completed rigging up his short wave set in Tahiti where M-G-M is filming "Typee" and has managed to get in touch with another radio enthusiast in good ole Hollywood who transmits all messages to Clyde's wiff. During the shooting (and we mean shooting) of "Trader Horn," it was Clyde who got the message through that Edwina Booth was dangerously ill and told the company's whereabouts, so that medicine could be sent by runner from the coast.

"Time Morches On"

● And speaking of beneficial hobbies, there's Johnny Arnold, who is at present experimenting with a new super-process screen, 33-38 feet. This new flicker sheet will make bigger and better things possible in the jumbies. It will allow

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twice as much light to come through than the present type does. According to Johnny, the new screen, when perfected, will result in the filmenagerie colony producing maam pitchers with larger sets, more action and of a far better quality . . . (well, hurry up, Johnny, Lard knows we need it.)

"Well, Moybe"

● We hear that Charlie Clarke, grinding "Mutiny on the Bounty," weathered a ten day sea voyage to location in the south seas that was flavared with typhaans and mauntainous waves without once swallowing his breakfast twice. However, here's the gag, the day after arrival, Charlie hired one of those out-rigger canoes to da a little early morning fishing . . . After two hours on the bounding main in the double-barreled skiff he gat sa sick that he was confined to bed far a day.

"Moybe Agoin . . . But There's Witnesses"

● It seems that Karl Struss was out tearing the turf at the Lakeside weed chapping grounds, one of those days when he wasn't shaating camera curves of La West. Carl stepped up to the sixth, disregarded his caddy's advice, and smacked a hole-in-one with a niblick. Naw Carl is praudly gathering laot danated by various manufacturers far such a feat . . .

CORRECTION

Lost month on page 145 the coption with the illustration stated the scene was from the Worner production "Oil for the Lomps of Chino." It should have been credited to the production "Go Into Your Donce," according to Tony Goudio.

R.C.A. Drops Reeves Suit

● According to a statement made by Art Reeves of Hallywaad Mation Picture Equipment Ca. of Hallywaad, manufacturers of the Artreeves Saund System, the R.C.A. wha instituted suit against his company in 1933 alleging infringement of saund patents have withdrawn their suit from the courts. This means according to Reeves that he can cantinue the manufacture of his saund equipment far sale in this country without infringing the R.C.A. patents.



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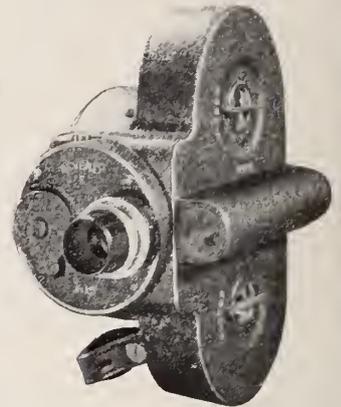
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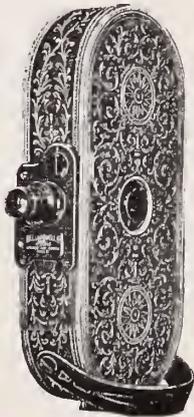
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Agfa Anasco processing laboratories are located in New York, Chicago, Kansas City, Los Angeles and Montreal.





AMATEUR MOVIE SECTION

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Next Month . . .

- There will be a continuity suggestion that will be of interest to every home movie user.
- Members of the A.S.C. will contribute timely and interesting articles that will prove instructive to the amateur.
- Things of a technical nature will be discussed in such a way that will not only interest but benefit the amateur.

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Eastman's New 16mm Color

Film

Sensational

THOSE who have seen the new Eastman Kodachrome 16mm color films claim it the finest commercial color to reach the motion picture screen up to the present time.

Many connected with the motion picture profession in Hollywood hail it as even better than Technicolor. With this film it is now possible to take pictures indoors. The skin texture and the reproduction of the coloring in the human eye, face and hair are said to be sensational. This means the amateur no longer must seek out flower beds, but can obtain beautiful colored pictures of his family and friends.

Eastman announces this film will be placed on the market on May 1st and will retail for \$9.00 the 100 feet, and will be supplied in 16mm reversal stock only.

Whether it ever reaches the professional market and be used in 35mm will undoubtedly depend upon future arrangements to be made between Eastman and Technicolor as it is claimed there are over-lapping patents.

This makes color film available for every 16mm camera. No special filters are required either for photographing or projecting. The speed is such that even the cameras with the very slow lenses can use this film.

The exposure required is somewhat more than that of the ordinary panchromatic film used for making black-and-white pictures. It is recommended the next larger stop be used than would be used for black and white.

For ordinary pictures, no filters or other attachments are required in the camera; but Eastman provides two camera filters for special purposes. One of these is used for photographing objects at a great distance, objects which in ordinary photography would be obscured by haze. The filter, in fact, plays the same part as the yellow filter used with panchromatic film; but it would, of course, be impossible to use a yellow filter, that would affect the colors. The filter used absorbs ultra-violet light only. If no such filter is used at great distances, objects will appear too blue, owing to the scattered ultra-violet light, which will record on the film as if it were blue light. Occasionally, this haze-cutting filter is useful for objects at a medium distance. For instance, when there is snow on the ground the air seems to be full of scattered blue light and the picture will be a little too blue unless the ultra-violet light is absorbed.

A filter is desirable if pictures are taken by artificial light, since otherwise the pictures will appear altogether too yellow or red. This filter is of a light blue color adjusted to compensate for the yellowness of the artificial light source.

At the present time, and probably through 1935, the processing will be done only at Kodak Park.

Up to the present Eastman has not been able to arrange to make duplicates. It is not improbable that eventually they shall succeed in making duplicates; but this requires a good deal of special study.

They are also not yet prepared to supply Kodachrome film in other sizes than 16mm—not because it is impossible to do this but because up to the present they have only been able to construct the necessary processing machinery and to work out the methods for the 16mm film.

The introduction of the new Kodachrome process seems

likely to mark a great step in the history of photography, as the possibilities of the new process appear very great.

Following is a technical description of the film itself and the process of developing furnished us by Dr. C. E. Kenneth Mees, A.S.C., of Eastman Kodak Co.:

"All practical processes of color photography depend upon the division of the light into three components, red, green, and blue-violet. Pictures are taken by these three components and are then combined by some method in order to give the finished color picture.

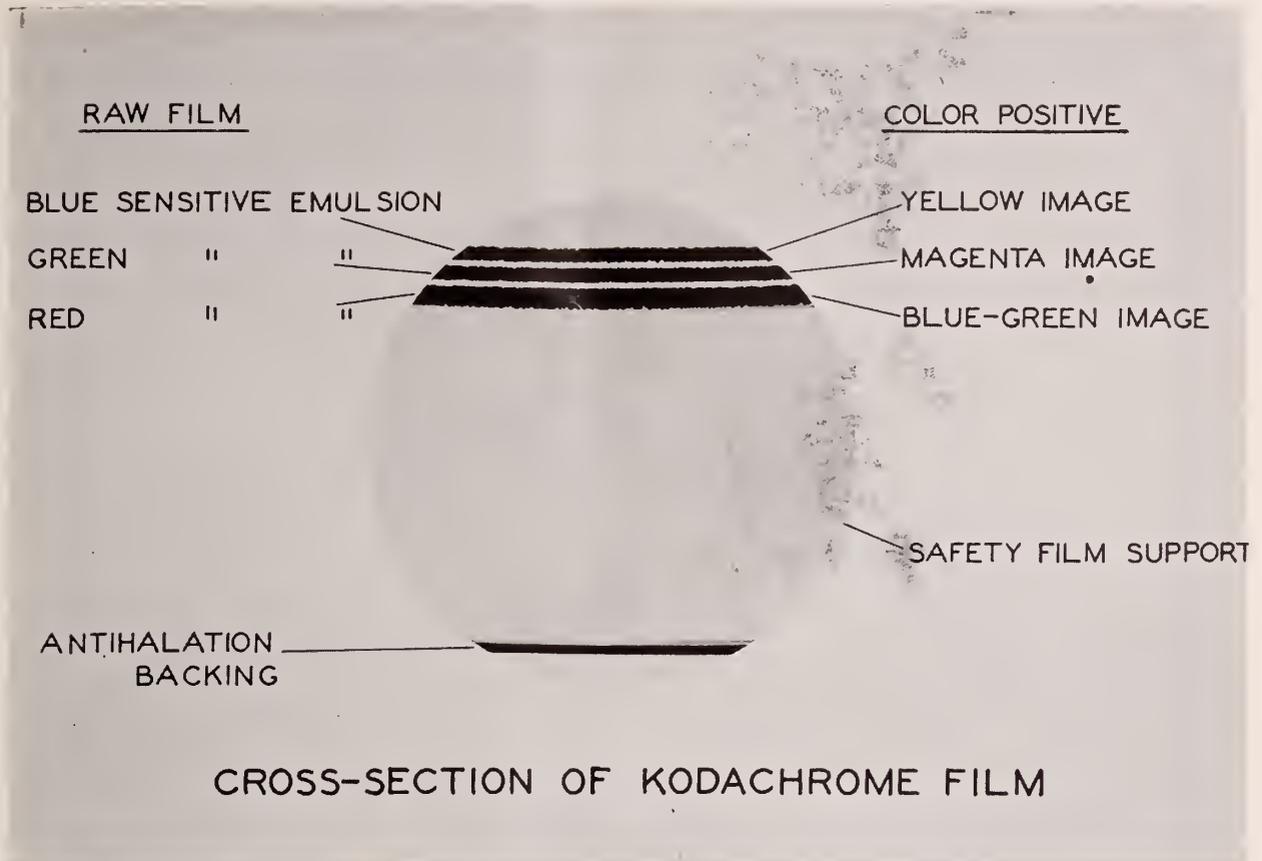
"Color processes are divided generally into two classes: the additive processes and the subtractive processes. In the first, the three components are combined by direct addition of colored images; in the second, the three components are combined by printing each negative in a color complementary to that which was used in taking, and these colored prints are then superimposed.

"In the classic experiment in which Clerk Maxwell demonstrated the additive process of color photography at the Royal Institution, he showed three pictures of a colored ribbon taken by light of the three primary colors, and he projected positives from his original negatives in superposition upon a screen, each of the positives being projected through a color filter of the same color as that used in taking the negative. With modern materials and filters, this method will give an excellent reproduction of a colored object. It requires very complicated apparatus, however, and is obviously a clumsy method of obtaining a color picture.

"Another type of additive process is that which is termed the 'screen-unit process.' In this, a screen is used over the whole area of the film, which is composed of very small color units—red, green, and blue. A photograph is taken through the screen and is thus split up into tiny areas, each of them taken through one of the three preliminary filters. On projection, these areas cover the entire picture with little spots of colored light. If a red object be photographed, for instance, the film will be fully exposed behind the red units of the screen but will not be exposed behind the blue and green units, and after reversal, the green and blue units will be blocked out by the black deposit of silver, while the red units will be projected in full brilliancy and will thus produce a red area on the screen corresponding to the red object which was photographed.

"This process has the advantage that the film can be used in any camera, exposure can be controlled in the ordinary way with a diaphragm, and the film can be projected in any projector. Its practical disadvantages are confined to the screen pattern, which is apparent on projection, to the absorption of light by the screen unit, which involves a considerable loss in brightness, and to the cost of the special screen-unit film.

"In the Kodacolor process, which has been very successful for amateur cinematography, the color separation



CROSS-SECTION OF KODACHROME FILM

is obtained optically. In the lens of the camera is placed a multiple-color filter composed of red, green, and blue units; and the tiny lenses embossed on the film make multiple images of these three units on the film emulsion. In projection, the same three filters are placed on the lens and a color picture is obtained on the screen. A multi-color image in the form of microscopic colored strips is projected and reproduces the colors of the original.

"Turning to the subtractive processes, if the three negatives are printed as images in colored dye—the red negative as a blue-green image, the green negative as a magenta image, and the blue negative as a yellow image—and these three color images are assembled in register on top of each other, a color picture will result.

"It will be seen that a red color can be obtained either by the projection of light through a red filter on the screen, as in the additive processes, or by the projection of the light through successive magenta and yellow images, the superposition of the yellow on the magenta producing red. In the same way, a green image can be obtained by putting a blue-green one on top of a yellow one, and a blue-violet image can be obtained by putting a blue-green image on top of a magenta one.

"In working the subtractive processes, the three negatives may be taken just as for the additive process, and then positives are printed in some way which enables them to be made of a colored material, the commonest being to make them by printing in bichromated gelatin. By this process, the three negatives can be printed in colored dye, the picture taken through the red filter being printed on gelatin dyed blue-green, the one taken through the green filter on gelatin dyed magenta, and the one taken through the blue filter on gelatin dyed yellow. If the three are superimposed in register, the resulting transparent color picture will reproduce the colors of the original subject.

"Subtractive processes of this kind are being used

successfully for the projection of theatrical motion pictures in color, but it is clear that to make one print only by this method, as is required in amateur cinematography, would be extremely expensive, whereas since the three negatives have been obtained and a method of printing them has been worked out, the preparation of a large number of prints is not unduly costly.

"The new Kodachrome process is a subtractive process, but the separation of the light into the three components is not accomplished by placing the separate components in juxtaposition. They are separated in depth.

"The film for this process is coated no less than five times! Nearest the base, an emulsion is coated which is strangely **red-sensitive**. This is then over-coated with a separating layer of gelatin containing some dye to act as a filter. Above this is coated a **green-sensitive** emulsion. This is over-coated again with another separating layer. Finally, there is applied a top coat which is **blue-sensitive** and which contains a certain amount of yellow dye. The five coatings are so thin that the total thickness of the film is little more than that of ordinary-line Kodak film.

"The emulsions are so adjusted that the sensitizers do not wonder from the layer in which they are coated, so that the bottom layer remains red-sensitive with very little green sensitivity, the middle layer is green-sensitive and is free from red sensitivity, while the top layer is sensitive only to the blue. When a picture is taken upon such a film, the three components are automatically separated in the depth of the coating. The red component is formed in the red-sensitive emulsion nearest to the base, the green component is formed in the middle layer of emulsion, and the blue component forms the image of the top layer.

"In order to obtain a color picture with this film, all that is necessary is to transform each component image of the negative into a positive image consisting of a suitably-colored dye. The image formed in the red-sensitive layer

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At top: No makeup; bottom: the effect with makeup.

Dabbling In Makeup —"Straight Makeup"

by
Wm. J. Grace

WITH the opening paragraph may I wager that not over one in fifty readers of this series of articles on movie makeup for the amateur has given serious thought to applying the principles of makeup to their cine work, because while it makes nice reading and increases the store of general knowledge, there seems to be little cause to get excited about employing makeup.

If you are one of those forty-nine disinterested persons who read but have not thought about a subject seem-

ingly out of your depth, may I present concrete examples of the reasons for using makeup at all in the form of two sets of "before-and-after" illustrations. I believe you'll find the advantages of makeup quite forcibly exhibited.

Examine closely the four photographs. Look at them as critically as possible. Criticise the comparisons from any standpoint—see if the characters of the models have been changed by makeup. I believe you will come to the conclusion that the straight makeup has in no way altered the actual characters of the models, but rather has **accentuated** those little things which mark each of them as an individual. One of them has a beautiful mouth, the other beautiful eyes. I do not mean to slur over other features, but the points I have mentioned are, in real life, the first things you would notice about them.

It is the subtle accentuation of one's outstanding feature (or features) that justifies the use of makeup, whether in real life, on the stage, or on the screen. And there must be a lot in this subtle power, for the cosmetic industry is one of the largest in the world. In no other industry is it possible to sell a dime's worth of colored grease or chalk for a dollar and get away with it.

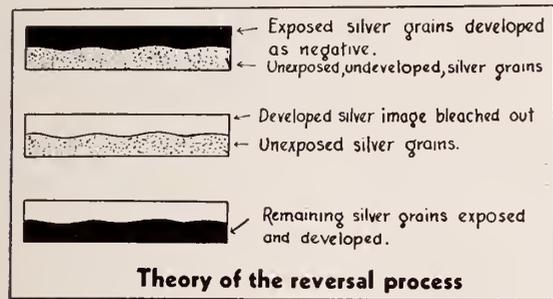
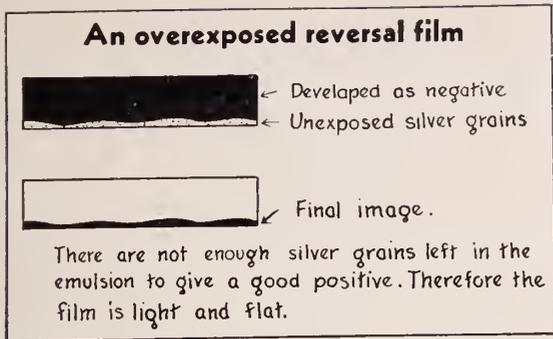
Perhaps the thing which strikes you in comparing these before-and-after pictures is the almost unbelievable difference in photographed skin textures. In real life both these models have beautiful complexions, in no way suggesting large pores or wrinkles. Yet, the brilliant lighting necessary for photography in light and shadow plays tricks with the finest skin texture—every little depression, no matter how small, photographs as a visible hole.

I am no student of cosmetics and can therefore assign no scientific explanation for the phenomenon. I do, tho, have a suspicion that makeup smooths skins for camera work because it is soft enough to go down into those tiny pores and color them the same as the surface of the

(Continued on Page 220)



At top: Photographed without makeup; at bottom: same girl with makeup.



your film has been exposed it is developed much the same as a negative from your still camera, i.e., it is developed as a negative. Now if you wanted this film to be a negative you would put it in hypo and dissolve out the silver which was unexposed and hence which has not been turned into metallic silver by the developer. But, we want a positive image of the picture and not a negative, and so instead of putting it into hypo to eat out the undeveloped silver, we put it into a reversing solution which eats out the black metallic silver which has come up as a negative, but this does not affect the unexposed, undeveloped silver still in the emulsion. After the developed silver has been eaten away the film is exposed to light, and the undeveloped silver remaining is exposed. This is then developed and it forms a positive image. You can see that you have used up all of the silver in the emulsion. Now supposing you have overexposed your film. It first comes up as a negative. Since it is overexposed it gets very black, using up a great many more of the silver crystals than it should. When these are bleached out in the reversing bath there is not enough silver left in the emulsion to make a black positive image and it appears too light on the screen. If it has been underexposed the opposite is true and the final positive will be too dark. Of course, if you make your exposure even all through the roll, and whether you over or under expose it, this can be controlled in the first development so that the final image will probably be pretty good. That is why it is better to shoot a whole roll in one day—the exposure is more likely to be more even.

By referring to diagram No. 2 you can see what happens when a film is overexposed. The only method of correcting such an error is to underdevelop it in the first development. Since the whole roll must receive the same developing time the rest of the roll will have to suffer if this one scene is corrected. Therefore the exposure should be kept even. Correction of any kind means loss of detail. This is true of any kind of photography, but since movie film is so small in size the losses are more easily seen.

Reversal film will give you excellent black and white titles with perfectly black backgrounds. It will allow you to make spotlight pictures or to photograph large black areas with a normal scene in only part of the frame, or any other special effect you may want. However, you must expose it correctly, and use a film which is developed by personal attention to each roll. Don't expect the laboratory to put pictures on your film. You must do that in your camera.

There is one thing in your favor, however. All emulsions have been improved in the last year so that they have more natural latitude in the film itself. The new Plenachrome emulsion probably has more of this natural latitude than any film yet produced. As time goes on we can probably expect more and more of this latitude as the film makers are constantly at work and they are bound to make improvements. So much for the exposure and correction for exposure errors in reversal emulsions.

All of this sounds complicated. It is meant to be for those who want to do the unusual. If you want just ordinary pictures go ahead and make them like you have always done, but if you have been getting some scenes too light and others too dark it will help you and save you money to try to understand a little more the process you are using.

Special effects take plenty of time, patience, and experimenting, but the finished result makes it well worth while. With reversal film you must be careful, but most anything can be done with it when you learn the proper technique.

Special Effects with Reversal Film

by

J. Lloyd Thompson

Laboratory Supervisor, The CALVIN CO.,
Authorized Agfa Ansco Reversal Laboratory

THERE have been a number of writers who have made a number of statements about the use of reversal emulsions in movie work which has done much to discourage the serious worker from trying special shots. For instance, the serious worker has been warned against trying effect lightings with a great deal of black background in them because the automatic processing machines will grey out the blacks and the results will be muddy. That has been true of films processed that way, but there are reversal films on the market which are not processed by the automatic method, but each film is given individual attention. Reversal films which are processed by this method will give you any effect you want provided that it has been correctly exposed. That is, it will do anything which a negative positive film will do. It will give you roundness, depth, detail, large areas of black space, perfect fade outs and fade ins.

Correct exposure in the reversal process is absolutely necessary if the best results are to be obtained. And it doesn't matter what film you are using either. Too much stress cannot be placed on this point. However, with an electric meter there is no reason for missing exposure. In order that you may understand this it will be necessary to tell you something of how the reversal process works. After



A "Documentary" Film From Stock-Shots

by
William Stull, A.S.C.

A "DOCUMENTARY" film can be either as intricate or as simple as you wish to make it. What chiefly differentiates it from the more familiar genres is the one requirement that it must be informative. This is a matter of treatment as well as subject-matter; even a hackneyed home-movie subject like "Baby's Bath," for instance, would automatically become a film-document if the film were made to show not merely the fact that a baby is being bathed, but what is the correct method of bathing a baby. This treatment can be applied to almost any subject; and while the more intricate operations are best filmatized if everything, from shooting to editing, is planned with this idea in mind, surprisingly interesting documentary pictures can often be made from ordinary shots if they are intelligently edited and titled.

Here, for example, is a "Documentary Film" continuity with which I assembled some left-over scenic shots into a picture which has received favorable comment from every audience that has viewed it:

MAIN TITLE:

THE ROMANCE OF A RIVER

(I made this on an art background, using a pictorial still-picture showing a river wandering across a valley.

This was done in double-exposure, first fading the picture in, then the words, after which first words, and the picture faded out.)

TITLE: All the World loves a river. There is a blessing in its ceaseless flow—a mystery and a fascination in the story of its endless journey to the sea.

Scene 1. FADE IN. Long-shot of a broad river, flowing away from the camera. If possible, make this in a back light, with the light reflecting strongly from the water, with the river banks left fairly dark. FADE OUT.

TITLE: For centuries a blazing sun has drawn up water from a shining sea.

Scene 2. Back-lit long-shot on the seashore: silhouetted rocks in the foreground, clouds in the sky, and the back-lit surf gleaming.

TITLE: And clouds have formed, wind-tossed about the sky.

Scene 3. Heavily-corrected shot of clouds. Preferably, with no ground showing in the scene.

Scene 4. Long-shot, heavily filtered, of clouds over tall trees.

Scene 5. Long-shot, in stop-motion, showing clouds swirling over mountains.

TITLE: Then from the clouds, snow has fallen softly, until it lay like clouds upon the slopes.

Scene 6. Long-shot, heavily filtered, of a snow-clad mountain, with great fluffy cloud-banks above.

Scene 7. Similar long-shot, but with more foreground, and heavier clouds.

Scene 8. Closer shot of a snow-covered mountain peak, with clouds in the sky above.

Scene 9. Panorama of a snow-clad mountain range.

TITLE: Fed by the snow and rain, small streams emerged . . .

Scene 10. Close shot of a rivulet coming from the foot of a melting snow-bank.

Scene 11. Medium-shot of a brook, running between banks of melting snow.

Scene 12. Long-shot of a valley with a stream in the centre, flowing toward the camera. In the distance, a snow-clad, cloud-draped mountain.

LAP-DISSOLVE TO:

Scene 13. Medium long-shot of a waterfall in a small stream plunging through a forest.

TITLE: To start their ceaseless journey to the sea.

Scene 14. FADE IN. Long-shot of a white-water river in a deep, wooded canyon.

Scene 15. Closer shot of the same, made from above. Pan upward to show canyon walls and skyline. FADE OUT.

TITLE: "And see the rivers how they run . . .

Scene 16. FADE IN: long-shot of a broad, placid river curving through steep hills (flowing away from camera). FADE OUT.

TITLE: . . . through woods . . .

Scene 17. Long - shot, made from a low set - up, showing a river (in the foreground) flowing between tall trees.

TITLE: . . . through meads . . .

Scene 18. Extreme long-shot of a river meandering across a cultivated valley.

TITLE: . . . in shade . . .

Scene 19. Close shot of a river flowing past the camera, under heavily leaved trees.

Scene 20. Close shot of a shady tree close to a river-bank.

TITLE: . . . in sun . . .

Scene 21. Medium long - shot of a river flowing through a bare, open valley; OR a shot similar to Scene

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The Camera I Would Like To Own

by
Wm. J. Grace

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FROM the gentle art of day dreaming often come the visions of better things which will someday come to pass. From the daydream to the drawing board, from the drawing board to the manufacturing plant, and from the manufacturing to the ultimate consumer may involve many months of planning, engineering, and advertising. But a start has to be made somewhere, sometime.

All this does not mean that from the inspiration which this article may arouse will immediately spring a camera which will fulfill the dreams of one man. So please have mercy on the stenographer of the author (who, by the way, is the author), and do not send your orders until further advised.

What I mean to say, if you'll pardon me, is that ever since I've worked with amateur cine equipment I've had dreams of better equipment. I don't mean merely the substitution for the present nickel plate of chromium plate; I don't mean the mere refinement of existing apparatus; I mean something really better, different, basically improved.

Automobiles for years went along getting a little more refined here, more fancy there, more convenient somewhere else. Each year's models were slightly improved, but still the basic ideas of construction were the same from year to year. Then, one manufacturer, noted for his dramatic introductions of new ideas in the automotive field, got down to the why of this and the wherefore of that, and found we were driving 60 miles an hour in 30 miles an hour cars. He drastically relocated not only the mechanical components of the car, but the location of passengers as well, and then shaped the car for more efficiency at modern speeds.

The same thing is going to happen to amateur cine cameras one of these days. Some aggressive manufacturer is going to scrap a lot of preconceived notions about what the public wants, and get on the market something the public really and truly is demanding. Why aren't there more cameras in use today? Simply because something more drastic or dramatic (or call it what you will) will have to be done than adding a cute little panel of color here or a shiny gadget there.

Nothing is ever completely perfect for all time, for our very notions of perfection are as changeable as the style of women's apparel. Therefore, I should hesitate to call this camera I would like to own the "perfect camera." By the time I got it, I'm sure I'd think of something else I'd want it to have. But for the present, at least, let's see what one man thinks should be the plans and specs of the "perfect camera" for the present.

The first thing I would do, is write the specifications to read, "No carrying case shall be required. The camera should be so covered, possibly with a substance like leather, that there would be no need to further enclose it for transportation."

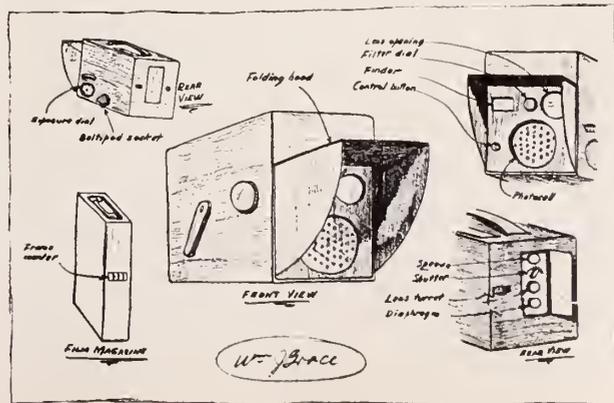
Why would I eliminate the carrying case? Ask yourself that same question the next time you take out your camera for a bit of filming. You don't dare risk smashing a lens or tearing off the spring-winding handle or some other lever or knob by carrying the camera without the case, but the case is an awful nuisance to lug around. The design I've sketched doesn't need any carrying case, as you will note. All controls and the lenses are completely protected from injury when the two covers are closed.

The next paragraph in the specifications would start, "The camera is to use 8mm film." Now, here is where I've got to back up against a wall and start fighting! A year ago, you know, I was invited by the editor to discuss the possibilities, present and future, of 8mm, and the article, "HOW ABOUT THE 8?", appeared in March, 1934. I was strangely attracted to 8 then, and now that a year has passed, I feel all the more strangely in favor of the tiny but efficient film. So much so, that, could I have the camera I'm describing, I would gladly trade in my three 16 cameras and my 16 projector, and have all my library reduced to 8.

It is not a case of merely being obstinate about liking the 8, for I try at all times to keep an open mind. I have found, tho, that most 16'ers violently disagree with my views, possibly because they don't know just how fine 8 work really is. Then, too, there is always the argument that "it would be so expensive to have all my present 16 reduced to 8," but it is an argument that won't hold water. If one films at all, the cost of such reductions would be more than gobbled up by the savings in 8 film cost from this point on.

True, 8 now has only one emulsion available—pan. When the market justifies it, tho, there'll be as many (or more) emulsions for 8 filmers as there are now for 16. If you prefer to wait until then, that's all right with me, but may I suggest that if you wait, say, about a hundred years, perfection may be nearer in almost everything. In other words, why be stubborn about it—why not get into the development and grow up with it? If we had all waited until radio was "perfected," we wouldn't have any radio at all today.

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Fearless Silent 16mm Professional Camera

by
Ralph G. Fear
President, Fearless Camera Co.

ONE of the most interesting developments of recent years in the amateur or 16mm field, is the new Professional 16mm Fearless Silent Camera, and its associated sound recording attachment.

This new camera is a miniature duplicate of the well known professional 35mm and 50mm camera manufactured by the Fearless Camera Company, and has all of the features that professional cameramen have found necessary for regular production of motion pictures.

The camera does not have a spring motor drive, but is arranged to be driven by an electric motor, or cranked by hand. Conventional detachable magazines of 400 feet capacity, arranged either for daylight loading spools or standard 400-foot rolls, are placed on top of the camera and held by a quick-releasing screw.

The camera is built with an internal driving mechanism arranged to drive a detachable sound recording attachment which is placed underneath the camera. The recording attachment is held to the camera by a quick-releasing screw which is turned by the camera hand crank.

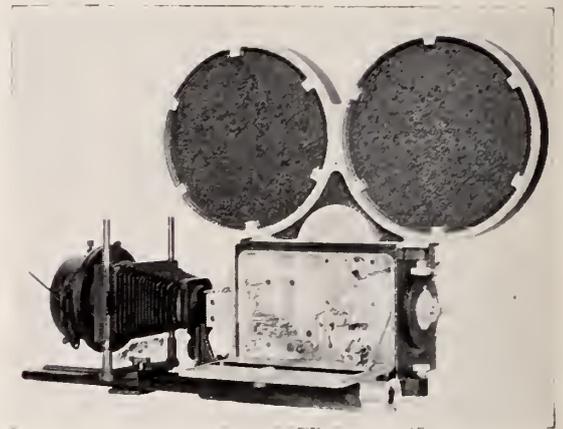
One screw holds either the camera or sound recording attachment to a conventional professional type tripod, the tilt head of which may be either a friction type or geared type.

A miniature professional type Iris, matte box, filter holder and sun shade are mounted upon the front of the camera.

Two types of motors have been developed for driving the camera, one being a universal variable speed motor which may be operated from either alternating current or direct current and is calibrated for speeds from 8 to 32 frames per second, the other being a standard synchronous motor of special design which can be furnished for either single phase or three phase current.

The camera has a professional quick shift device for focusing, focusing of the camera lens being made upon a ground glass, the image formed thereon being viewed through a magnifying focusing tube where the image appears right side up and right side to.

To elaborate on the method of focusing the photographic lens—the camera is built with a sliding turret and lens carrier on the front of the camera box. This lens carrier is mounted in dovetails and constructed so that it may be shifted across the front of the camera box to a point where the photographic lens is in front of the ground glass of the focusing tube. The lens carrier is made so



At top the custom built Fearless 16mm camera with sound unit attached. At bottom same camera without sound unit showing interior mechanism.

that the light shade is mounted to it and instead of having to shift the camera, magazine, motors, cables, etc., only the light weight lens system and light box are shifted.

The actual shifting is accomplished by merely pressing down a knob and moving a lever from one side of the camera to the other. This focusing operation is performed so quickly that it has been a revelation to all who have seen it. Suitable stops prevent over-travel and suitable locks are provided to hold the lens carrier either in the focusing position or in the photographic position. The image is viewed with a conventional finder or focusing magnifier which is supplied for either five or ten power.

The focusing telescope is of the simple astronomical type, and re-inverts the inverted image formed by the lens on the ground glass, thus bringing the viewed image right side up and right side to.

The camera has been designed for silence throughout and extreme pains have been taken in the design and construction to eliminate noise wherever possible. The camera can be used in the open for all ordinary shots without any sound proof covering. This has been accomplished by using fibre gears to transmit the power, precision bearings for the driving shafts, and by inclosing all moving mechanism outside of the movement and sprocket assembly in grease tight and sound proof compartments.

The camera is arranged so that the driving motor drives directly into an extension of the movement cam

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WHEELS OF INDUSTRY

● Burleigh Brooks announces a new angle of the Rolleiflex Salon.

The manufacturers of the Rolleiflex Camera, Franke & Heidecke G.m.b.H., in Braunschweig, Germany, are advancing a prize contest for European users of the Rolleiflex, simultaneously with the American. They have in prospect for publication next fall "The Golden Book of the Rolleiflex," in which the best pictures from both contests will be reproduced. The book will be very handsomely edited and compiled, and will have a large distribution all over the world.

The firm of Franke & Heidecke G.m.b.H. now offers an additional prize of from \$10.00 to \$20.00 for each picture which they see fit to reproduce in this manner, in addition to a free copy of the book itself. This, of course, is altogether independent and additional to the prizes granted by Brooks.

The Kemco Filmvisor

● The heretofore slow and laborious task of editing and re-arranging amateur movie films has been greatly simplified thru the use of the new Filmvisor announced by The Automatic Electrical Devices Company, of Cincinnati, for use with all 8 or 16mm films.

One of its features includes both 1:1 and 4:1 ratio rewind speeds, with a transferable brake to prevent unwinding of free reel should rewinding be stopped suddenly. Splicing outfit is self contained, and of simple, though sturdy construction, and easily operated.

When using the Filmvisor for inspecting or reviewing a film, the latter is wound slowly under a powerful magnifying glass, and over an aperture illuminated by a bright light, greatly enlarging the film image. A new and unique method of identifying each scene, thru the application of a small gummed sticker to the film at the end of each scene, and the listing of all scenes on a Master Editing sheet, with a brief description thereof, makes final cutting and re-arrangement of the various scenes extremely simple.

When used for cleaning a film, the lamp housing is reversed, bringing a single roller in place, over which the

film is slowly run, passing thru a piece of chamais cloth saturated with a quick drying cleaning fluid, which removes all grease, dirt, etc.

Emulsion Remover

● According to announcement of the Rocco Laboratories their Emulsion Remover enables one to make a firmer splice with greater ease and perfection.

The Emulsion Remover peels the emulsion from the base of the film. With ordinary scrapers the tendency is to scrape the base, making the base thinner than necessary for making the splice according to their claim.

The importance of avoiding scraping the base thin is readily discerned, since the cement is apt to dissolve the thinned area, making the patch weaker at the outer edges of the splice, causing the splice to tear apart.

The Emulsion Remover is an instrument having a moistened wick in the barrel of the holder with a straight blade at the end and the wick extends under the blade.

For operation the emulsion is moistened with the wick and the blade peels off the emulsion.

A gentle turn of the fingers alternates the wick and blade, placing either in position for operation.

The Emulsion Remover moistens the emulsion, instead of saturating it. When the film becomes saturated, the excess water will soften the emulsion beyond the splicing area.

Film Cement attacks the base of the film best, when less moisture is present.

New Wipe Off Device

● J. D. Cochrane Jr. of Cincinnati announces he is about to market a wipe

off device to fit the Cine special under the trade name of DuMorr Radial Wipe.

This device is a self contained unit which can be mounted on the tilting tripod head allowing the camera to be bolted in place in the usual manner. No modification of the camera is necessary other than the removal of the eight-frame-per-turn crank and installing on this axle a gear which actuates the mechanism. A special spring-winding key is provided to take the place of the regular handle in winding the spring motor when the wiping device is in use. Also, a special rewinding handle is supplied for use on the one-frame-per-turn axle to rewind the film in making a wipe. The accessory weighs one pound and is constructed mainly of block Formica.

The direction of the wipe can be made from right to left or vice versa by twisting the belt on either set of pulleys. The effect can be further modified by varying the number of frames of film rewound, producing either a black or white radial beam as desired. The length of the wipe can be either 1½ or 3 seconds according to which set of pulleys are used for the belt which drives the fan.

Leica Doto Book

● The fourth edition of the Leica Data Book by Karl A. Barleben Jr. F.R.P.S. has just been published by the Fomo Publishing Company of Canton, Ohio.

This little handy sized book which sells for \$1.00 has 84 pages of interesting information for the users of the popular Leica camera.

The book is divided into seven main divisions. The first treats with lenses, the second is titled "Exposure Data," the third "Film Data," then follow "Filter Data," "Projection Data," "Development Data" and "Conversion Data."

Book of Formulas

● For many years "HENLEY'S 20th CENTURY BOOK OF FORMULAS, PROCESSES AND TRADE SECRETS" has been a standard book.

Last month the new 1935 edition, revised under the editorship of Prof. T. O'Connor Sloane, made its appearance.

The formulas themselves, have been revised. The latest methods and trade practices have been included. Many



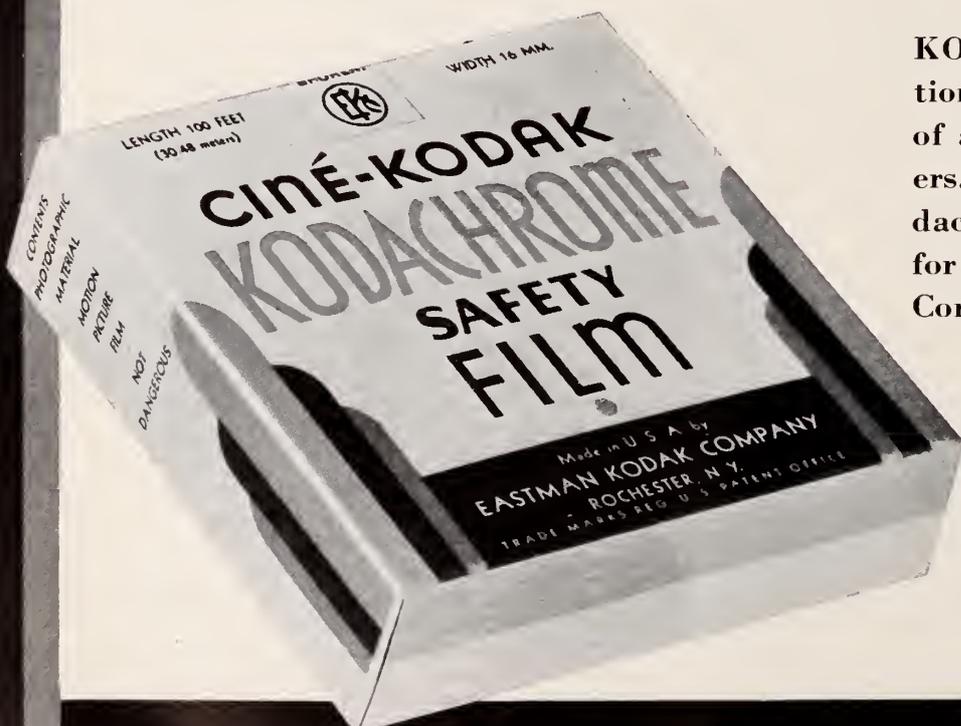
KODACHROME

FULL-COLOR MOVIES with any
16 mm. camera of 100-foot film capacity

HERE are the facts about Kodachrome, the new Eastman full-color 16 mm. film, of which Dr. C. E. Kenneth Mees, Vice-President in charge of Research and Development, Eastman Kodak Company, says: "... The pictures made by this new process ... KODACHROME ... are a revelation ..."

The page opposite answers your questions about it.

KODACHROME demonstration reels are now in the hands of all active Ciné-Kodak dealers. Make a point of seeing Kodachrome. The pictures speak for themselves. Eastman Kodak Company, Rochester, N. Y.



KODACHROME



Will my camera make full color Kodachrome movies?

YES—If your camera loads with 100-foot rolls of 16 mm. film—regardless of its lens speed. All diaphragm “stops” from *f.16* to *f.1.9* are “go” signs for Kodachrome. Merely slip a roll of Kodachrome into your camera, use the next larger diaphragm stop than that required for Ciné-Kodak Panchromatic black-and-white film (for example, *f.8* instead of *f.11*) and get movies in full, natural color. And you can make them with telephoto and wide angle lenses as well as with the standard lens of your camera.



Will my projector show Kodachrome?

YES, with the full brilliance and full size of black-and-white. There are no lines, no fringes, no screen pattern—only smooth, beautiful color. No filter is necessary. The color is in the film.



What extra equipment is necessary?

For your projector—**NONE**. For outdoor Kodachrome—**NONE**, except when making distance shots with a telephoto lens, long range shots with the standard lens, snow or high altitude scenes, or shots on gray days. For subjects such as these the Kodachrome Haze Filter is suggested. No change in exposure is required for this filter. Its price, depending upon the lens and camera used, is from \$1.75 to \$3.75. And for indoor Kodachrome with Photoflood Lamps a similarly priced Kodachrome Filter for Photoflood is recommended to cut down the preponderance of red rays found in artificial light. Kodaflector, Eastman’s \$5 twin-reflector lighting unit, is your best source of illumination. Outdoor exposure instructions are packed with each roll of Kodachrome. Indoor instructions may be obtained from your dealer.

Focusing cameras can be set at “25 feet,” or universal focus, just as when using black-and-white film. Nor are fixed focus cameras handicapped when using Kodachrome. Merely observe the usual precautions when taking close-ups, and use the portrait attachment if your camera is so equipped.



Can I show Kodachrome on the same reel as black and white?

YES. Those who do not wish to make all their movies in color can splice black-and-white and Kodachrome sequences together, project them consecutively. Focus and brilliance are substantially identical.



Where can I buy Kodachrome?

All active Ciné-Kodak dealers in the United States should have Kodachrome in stock right now.

The price is \$9 for 100 feet, including processing at Rochester, N. Y.



Can I get Kodachrome Film for my still camera?

At the present time Kodachrome Film is available only in the form of 16 mm. film because we have only been able to work out the processing methods and to construct the necessary machinery for the 16 mm. film.



Where can I see Kodachrome?

Most Ciné-Kodak dealers are already equipped to show you Kodachrome. Visit your dealer at once. Learn for yourself how inadequate any printed description of this amazing discovery really is. Visualize your favorite movie subjects as reproduced with the unmatched beauty and realism that only Kodachrome can bring to your screen.

For the time being Kodachrome Film is being processed at Rochester, N. Y., only. As soon as practicable other stations will be equipped to process Kodachrome.

Start Planning for the 1935 Contest

Now is the time to start planning for the American Cinematographer 1935 Amateur Movie Contest.

There will be a number of outstanding prizes. All worth while competing for.

THE GRAND PRIZE WILL BE.....\$250 in cash.
EASTMAN KODAK CO. OFFERS \$150 in equipment.
BELL & HOWELL OFFERS.....\$150 in equipment.

Start preparing now for entry . . . plan your picture. You can make it on either 16mm or 8mm.

Last year the grand prize winner was an 8mm user. The year before it was also an 8mm user. The size of your equipment is no bar to your winning.

The entries must be in the offices of the American Cinematographer by midnight, November 30, 1935.

If you wish further information address

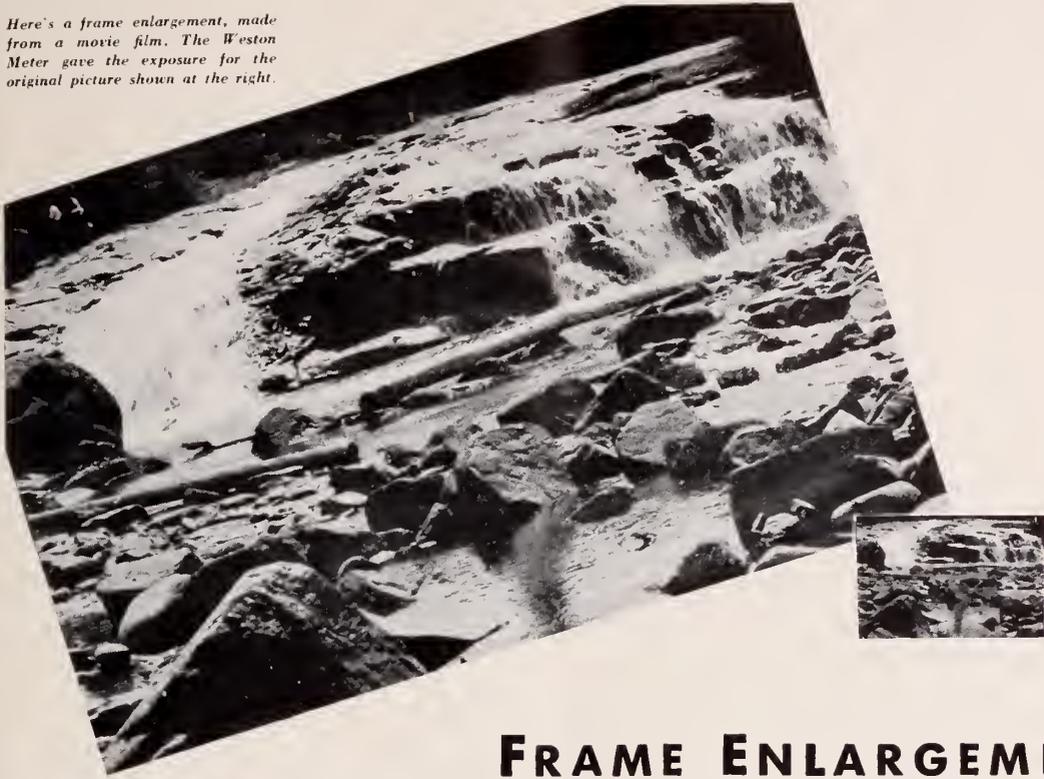
CONTEST EDITOR

American Cinematographer

6331 Hollywood Blvd.

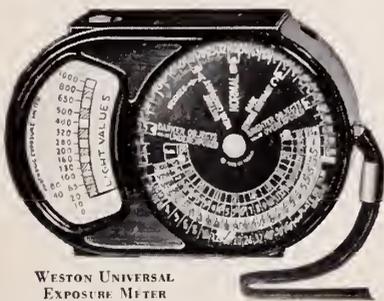
Hollywood, Calif.

Here's a frame enlargement, made from a movie film. The Weston Meter gave the exposure for the original picture shown at the right.



FRAME ENLARGEMENTS *prove the Accuracy* OF WESTON EXPOSURES

Will your pictures stand this acid test? Take any frame from one of your movie films. Enlarge it. Will you get results as shown above? You will . . . if a Weston Exposure Meter is used when shooting the film . . . for then every frame will be correctly exposed. True, your desire in making movies is not for frame enlargements; but you *do* want clear, sparkling movies . . . a re-creation of brilliance and life on the screen. You will get it if your exposures are correct . . . and they're sure to be correct if a Weston is used . . . Weston Electrical Instrument Corporation, 598 Frelinghuysen Ave., Newark, N. J.



WESTON UNIVERSAL
EXPOSURE METER
for use with all cameras
. . . movies, miniatures
and stills.

WESTON



Exposure Meters

EASTMAN'S NEW 16mm COLOR FILM SENSATIONAL

(Continued from Page 209)

is transformed into a blue-green positive; the image in the middle green-sensitive layer, into a magenta positive; and the one in the top blue-sensitive layer, into a yellow positive. This is accomplished by an extremely complex processing system. The images in the three layers are first developed, as with ordinary black and white film, and then by a series of treatments the images in the three layers are transformed into positives formed in the dye. The whole of the silver salts are removed finally, and the image consists of three superimposed dye pictures.

"The process is the invention of Mr. Leopold Mannes and Mr. Leo Godowsky, Jr. These gentlemen are musicians whose names were well known in the musical world when some years ago they commenced the study of color photography as a hobby. As a result of collaboration between them and the Kodak Research Laboratories for a number of years, it was evident that the work could only be brought to a successful conclusion by a full utilization of the re-

search and manufacturing facilities available at Kodak Park. Here, there were available experts of many kinds: organic chemists, emulsion-makers, dye specialists, photographic chemists, and experts in photographic operations—and in 1931, therefore, Mr. Godowsky and Mr. Mannes joined the staff of the Research Laboratories. By the complete cooperation of the staff of the Laboratories and of the Kodak Park Works, a task which at first appeared impossible was achieved and the Kodachrome process is the result.

"The processing, as has been said, is extremely complicated and involves the treatment of the film upon three separate machines. Experience has shown, however, that it can be performed with certainty and that the commercial production of the color pictures presents little more difficulty than the production of block-and-white pictures, although the complex processing treatment and the expensive chemicals used in it naturally increase the cost considerably."

WHEELS OF INDUSTRY

(Continued from Page 215)

complete sections are composed of entirely new material.

The scope of the book is so extensive that both amateurs and professional workers will find it valuable. There are 10,000 different formulas for all sorts of things for the photographer, householder, farmer, mechanic, laboratory worker—from making simple household washing powders or writing inks to practical methods of heat treating steel.

There is a very complete, cross-referenced index and a plainly written section on laboratory methods.

"HENLEY'S 20th CENTURY BOOK OF FORMULAS, PROCESSES AND TRADE SECRETS" sells for \$4.00.

DABBLING IN MAKEUP

(Continued from Page 210)

skin, and that tricks the camera into thinking the skin is perfectly smooth. Street makeup, you know, is nearly always applied dry and can't get into the pores and color them the same as it does the surface.

This theory satisfies my own curiosity,

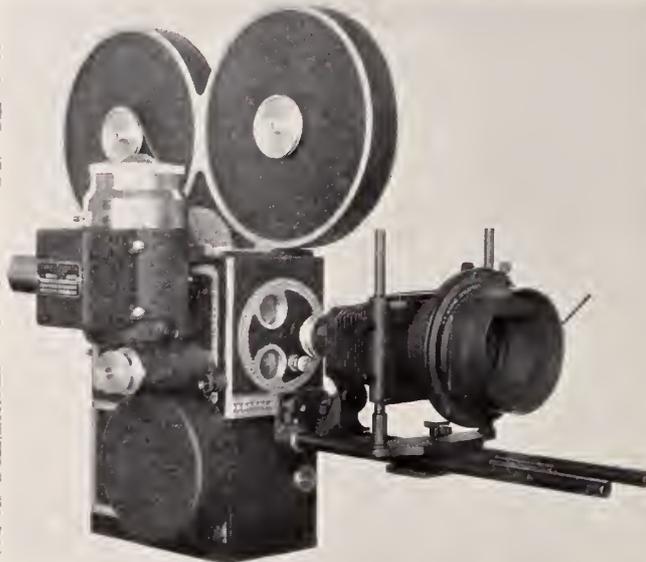
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7. Enclosed silent gearing.
8. Detachable sound recording head.
9. Automatic Anti-buckling device.



10. Revolving 3-lens turret.



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1. New professional type magazines—Doylight loading or standard film.
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3. Synchronous motor.
4. Inter-lock motor for double system recording.
5. Professional type Iris Matte box and filter holder.

Price of camera without equipment

\$1500.00

Complete equipped with 3 magazines Matte box, tripod sound recording attachment and universal motor.

\$2500.00

Cable: FEARCAMCO

FEARLESS CAMERA CO.

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Hollywood, Calif.

but whether it is correct or not you'll have to find out for yourself elsewhere. Personally, I have found straight makeup a lot more difficult than character makeup, because straight makeup requires a knowledge of skin textures and colorings which in my engineering experience is quite lacking. I can make up characters easier than I can make up straights because bold accentuation of a desired feature is a lot easier than a more subtle accentuation.

If you think I'm talking in riddles, if you believe straight makeup is foolproof and can be done by anyone regardless of his or her experience, all you've got to do is try it. If you hit it lucky the first time, you'll probably laugh at me, but my laugh will come when you try to duplicate the results and your luck has run out on you. I'm only trying to combat the idea that just because makeup is "straight," it can be put on without serious thought. And this isn't said because I happened to find straights harder to do than characters—I know of many other dabblers in makeup who have discovered the same thing.

But let's get down to cases and write down just how we got the results we did. What numbers of paints and powders did we use? What lip rouges were applied? What eye shadow?

Makeup, like any other art, cannot be measured with a yardstick and put on according to formulae. Some actual experience and practice is quite necessary. You cannot afford to take the exact shades we happened to use on these two models and expect results exactly like ours, because your models may not have the same facial expression, the same skin textures, the same cranial framework as ours had. So, when we say we used such - and - such paint or powder, remember that your own models may not correspond to ours, and use your own judgment.

The young lady of the upper set of photographs is a brunette with light skin. Her upper eyelids are full and round, and the bony structure, being well padded, casts no deep shadow above the eyes. Because thin eyebrows are the present style in feminine beauty, she plucks them into rather a thin line. With the full, rounded brow structure which she has, her face photographs as if she were constantly lifting her brows in an attitude of questioning—as if she were ready to say, "Yes?" Consequently, this alters her expression, and the camera does not yield a life-like image. To draw the brows down and connect them more closely to the eyes, then, requires a bit of shadow. We used the grey eye shadow to get a shadow because the lighting would have made it disappear. The film doesn't care whether the dark space is made by actual shadow cast by lights or by synthetic shadows produced with makeup.



SHOOT YOUR FAVORITE ACTRESS FROM YOUR SEAT IN THE THEATRE



SHOOT ALL THE FUN OF A GLAMOROUS EVENING FROM YOUR TABLE



SHOOT CHILDREN WHEN THEY'RE NATURAL —PLAYING, HAVING FUN



SHOOT YOUR FRIENDS WHEN THEY'RE NOT LOOKING—CATCH THEM ALIVE

Leica shots by Ivan Dimitri

E. LEITZ, INC. DEPARTMENT 26 • 60 EAST 10th STREET • NEW YORK CITY

This same young lady has a beautiful mouth, especially when it's opened in a smile or in conversation. It requires only smooth application of medium lip rouge, with the upper lip made a trifle heavier and fuller so that it will photograph rich and full when the camera is above the line of her lips or when she looks down below the camera. Last month, you remember, we made mention of this little makeup trick and gave the reason for the slightly fuller than normal upper lip rouging.

The young lady in the lower set of pictures is also a brunette, but her skin is darker, more olive in color. Where

SHOOT!

ACTION PICTURES AT NIGHT

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Take life as you see it, night or day, inside or out. Slip a compact Leica into your pocket and take it to the theatre, to that wedding, or anywhere, and snap intimate pictures that are really alive. 30 shots of life for \$.70.

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Leica DUFAYCOLOR film now makes natural color shots just as easy to take as any other pictures. No accessories are needed and you get 30 exposures for \$3.00. Leica leads again.

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For you this precision miniature camera will be a pocket full of fun that almost automatically takes perfect pictures under any conditions. Beautiful, clear enlargements up to 12 by 18 inches and more.

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A postcard will bring you fascinating FREE BOOKLETS about the many remarkable features of the cat's eye Leica, the camera that "sees in the dark". It sights and focuses automatically for you; accidental double exposures are impossible; it has interchangeable lenses, a focal plane shutter, speed from 1 to 1/500 of a second and many other features. Write today.



LEICA Model F with f:2 Summar Speed Lens

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DUFAY COLOR FILM

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Proving Sensational
Processing \$1.00 a Roll

MORGAN CAMERA SHOP
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the other model used No. 22 pancro, this one used No. 23. Both could have used one shade darker under the full illumination we used in making these pictures, but for average filming, the lights probably wouldn't be so intense

I hate to brag but...try and beat me for \$99.50

I am the Famous Ampro Model "A" 16 mm. Projector"

Like all thorabreds, I have the goods. Precisely made . . . aluminum die cast body . . . phasphor branze bearings . . . silent gears . . . automatic high speed rewind . . . forward and reverse . . . still pictures . . . and light—plenty of it—my ecanomical long life 400 watt Biplane Mazda is equal to 500 watt results.

Buy me an trial and judge for yourself. A thorabred projectar at a price you can afford to pay.

Your \$99.50 cheerfully refunded if not satisfactory after ten full days trial in your own home. Complete with case. Order now.

Full details and Bass Bargaingram is yours on request.

WANTED: More Live Dealers.



Camera Headquarters for Tourists

full-face and the ones we used would have been correct.

The outstanding feature of the second model is her deep-set eyes. In real life her eyes derive much of their beauty from the dark surrounding lids, but the camera has a tendency to accentuate unpleasantly the wrinkles under her eyes, giving a dissipated mien. The use of brown eye shadow brings out the deep setting of the model's eyes with make-up, but we kept the shadow confined to a smaller area and out of the wrinkle area. The shadow was very sparingly applied, much more so than in the case of the first model, because the lights themselves show some shadow with the second model. You will notice that considerably more top-lighting on the "after" picture of number two still doesn't make the eye shadows too deep, a thing far which we may thank makeup.

The lips of the second model presented somewhat of a problem, since the lower was rather full but the upper

rather thin. Consequently, not only was the upper lip made fuller, but we tried to thin the lower lip slightly, by not rouging the lip quite so fully.

So much for the experiments we tried in straight makeup on the faces of two rather different models. We found it lots of fun trying to make up these faces so they would photograph naturally, and learning the fundamentals of facial contours is a most interesting phase of movie makeup. We found that where there was no photographic shadow, makeup could provide one. And we found that natural shadows can also be toned down, with makeup.

Try some of this business of straight makeup yourself. It won't cost much, and it offers a pastime which can be substituted for the weekly bridge party when friends drop in. Next month we'll go into character makeup, something all of us think we know something about but which can be very baffling at times.

A "Documentary" Film from Stock Shots

(Continued from Page 212)

19, but made in a hot, contrasty top-light, so that the tree leaves glitter and give an impression of unrelieved sunlight.

TITLE: . . . sometimes swift . . .

Scene 22. Close shot of surging rapids. (If you have the footage, this can be elaborated by repeating in a series of short flushes made from different angles, and of different rapids.)

TITLE: . . . sometimes slow . . .

Scene 23. Long - shot of a placid, mirror-like stretch of river. This should be of relatively long duration, to add to the sense of slowness, and to contrast with the quick flashes suggested for the previous scene.

TITLE: . . . wave succeeding wave they go."

Scene 24. Close shot of ripples on the surface of a stream.

Scene 25. Close shot of a stretch of white-water rapids; if possible, from above, panning up- or down-stream to show a long succession of rapids.

TITLE: At times, they merge to form a placid lake.

Scene 26. FADE IN: Long-shot of a very calm lake, mirroring mountains, trees and sky.

Scene 27. Another, similar scene. FADE OUT.

TITLE: At times, they fall in head-long flights of foam.

Scene 28. Long - shot of a high waterfall: if possible, with a person in the field, to indicate the height of the fall.

Scene 29. Medium-shot of the fall, or a different one, if you have scenes of more than one. FADE OUT.

TITLE: Until, at last, they slip into the sea . . .

Scene 30. Long-shot (from a high

viewpoint) of the mouth of a river, flowing into the sea. (A back-light is good for this.)

TITLE: . . . where they are drawn again unto the sun.

Scene 31. Long - shot of back - lit surf, sky and clouds, similar to Scene 2.

TITLE: And so it goes, a constant, ceaseless chain—an endless tale—the romance of a river.

Scene 32. Medium long-shot of a strong, swift river, flowing away from the camera between high banks. FADE OUT.

TITLE: THE END.

This sort of a picture proves surprisingly interesting on the screen, though it may appear simple on paper. Granted good photography and clever cutting, the result should be highly effective, despite the simplicity of the framework. Of course, this outline should be adapted to suit the particular scenes one has at hand: if for instance, one has scenes showing boats, ships and the like on a river, a sequence can be added to utilize them; similarly, if one has a variety of shots of waterfalls and rapids, they should be utilized. This structure offers some fine opportunities to experiment with rhythmic cutting, especially in contrasting long, slow scenes, faded in and out, in the sequences illustrating the slow, placid streams, with a medley of short, quick flashes in the scenes of the falls and rapids. In my own picture, I found that the effectiveness of the film was greatly increased by toning the entire reel blue. For amateur use, this can very easily be done by using the "Tobloid" blue toner, which is available at most good photo-supply stores.

The Camera I Would Like To Own

(Continued from Page 213)

Enough of the arguments about 8. There will always be the die-hard group, just as there was when 16 came along. But 16 is here, and it will stay, just as 8 is here and here to stay. Choose your weapons, and then be man enough to admit with tolerance that the other fellow's weapons and cause may be just as good as your own.

And so, I've decided on 8. That means equipment about half the size of 16, and a film cost of a third of 16. With that momentous decision made, let us proceed in a less argumentative vein.

I should like very much to have a single lens of the Varo type, in which the elements may be varied to make the lens anything from 1/2" focal length to 1 1/2", with automatic iris diaphragm. I don't know whether this could be built or not, this Varo lens for 8mm work, but if any of my readers happen to be lens designers, I would appreciate your comments on the idea.

If I couldn't have a Varo lens (and the sketches have shown otherwise), I would be satisfied with a three-lens turret carrying a 1/2", a 1", and a 1 1/2". I don't personally care for wide angle lenses or extra long telephotos, and the range mentioned would be quite adequate for most work. I would have all the lenses so mounted, however, that the turret did the moving for focusing, not, the lenses themselves, as is now the case. Why go to the expense of calibrating each lens (and they tell me such calibration is a considerable part of lens costs) and making a screw mount for this adjustment, when the whole set could just as well be moved?

Focusing? Oh yes, that's a most important item. I should require a focusing means basically similar to that in the Cine-Kodak Special, but I would have this combined with the brilliant finder in such a way as to make either field visible thru the same finder. If the subject were bright enough, I would use the thru-the-lens image all during the shot, but if the illumination were too poor for that, I could use the brilliant finder.

So many are the advantages of getting absolute focus and field limits with a thru-the-lens viewer that it hardly seems necessary to review them. You and I know that only when we can see exactly what the lens sees can we be absolutely certain of our picture results.

Exposure? Automatic? No, I wouldn't want that. After all, one does like to have some say-so about what's to be recorded and how it is to be recorded. I would want a Weston exposure meter built right into the camera, possibly with a few minor revisions of the scales for simplicity (for instance, there would be no need for the scale to indicate down

to less than 1/15th second), the photonic cell facing the subject alongside the camera lens, the meter and scales located conveniently near the speed and shutter opening controls. If a picture was to be made of a subject having a brightness scale greater than the film had, the whole camera could be moved from portion to portion of the subject to determine the limits.

Now to a most important feature as regards convenience in operation—film magazines. The introduction of film magazines is, I think, one of the finest innovations in amateur cine work. Not making use of our cameras every day, we amateurs lose the fine touch and almost mechanical rapidity necessary to fast, accurate film threading. Consequently, a bungling job is done under conditions of pressure, and if we take time to thread the film properly, the shot is gone while we are getting ready for it with a new roll, the previous roll having disconcertingly come to an end right in the middle of the best part of the scene.

I am not wholly in favor of a magazine of the design used by Pockette and the new Bell & Howell 121 cameras, probably for the reason that I begrudge paying an extra fee for magazine convenience every time I load. I personally had much rather buy a pair or so of magazines outright, and load them up myself, in the manner of the Cine-Kodak Special. The bulk required by a roll of 16, however, is unnecessary with a little roll of 8. Where the magazine on the Special seems entirely too large for me, I can picture a very compact 8 magazine, even of the type I would load with regulation spools.

And now we come to the one point which only one amateur cine camera in the world (excluding the custom job of Berndt) provides—an adjustable shutter. Where not one amateur still worker in a hundred, if he knows his stuff, would take pictures of action at the slow speed of 1/30 of a second, the cine worker is forced to take any and all of his movies, whether the subject is standing stock-still or galloping for dear life, at that very speed. I'm going to keep on panning manufacturers until the editor will be notified by the advertisers that they'll refuse to use space in AMERICAN CINEMATOGRAPHER until that Grace person quits writing for the magazine, but I'll have a lot of fun watching these same people someday yield to public demand for just such things as variable shutters on amateur cine cameras.

Now for the final paragraph in the specifications for the camera I'd like to own and use. "Sound-on-film recording

GOERZ

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Kino-Hypar F/2.7-F/3

An all-round lens giving microscopic definition and affording crisp, brilliant images.

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A highly corrected High Speed Lens. Ideal under conditions of poor light.

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A Telephoto Lens of Good Covering Power and correction.

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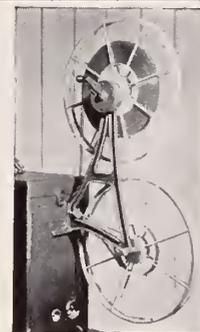
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MODEL A. Solid aluminum casting finished in black crackle. All other parts nickel plated. With geared rewind which may be released when not in use.

List Price, \$50.00

MODEL B. Same as Model A, without the geared rewind.

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head to be built into the camera." Only with the split 8 do I vision practical S-O-F recording for the amateur, for the reason that when you put the sound on the same strip of film with the picture, the splice has to be so long that it's a difficult thing for amateurs to make. They have a hard enough time making a straight splice hold with their silent films. With 8, tho, it's a different story, for then the splices are short. Loading the projector with a picture roll and a separate sound roll would cause no troubles, because both films would be driven by the same gearing.

If I have trod on the toes of camera makers in this outburst of day dreaming,

please forgive me. May I point out that I have also left out of the "perfect camera" any apparatus for making fades, dissolves, wipes, etc., and I happen to manufacture these items myself. I don't believe the effects should be built in, but should be made in an optical printer after edition of the film has been carefully made. Of course, that means extra film and an expensive printer, so perhaps I'll still enjoy an installation now and then for those who think they can time their effects correctly as they make them. At any rate, whether you agree with my ideas of the camera or not, pray at least believe me honest in my own convictions.

Fearless Silent 16mm Professional Camera

(Continued from Page 214)

shaft, thus transmitting the motor power directly to the most highly stressed part of the camera and eliminating a great deal of noise caused from gears. The motor itself absorbs any vibration caused by the intermittent movement.

Silent bakelite gears are used to drive the sprockets and shutter shaft. A large heavy shutter of the two-opening type running at a speed one-half of the inter-

mittent mechanism is used for a fly-wheel. This heavy revolving shutter also absorbs any noise that might be transmitted to the front of the camera and makes it possible to make colored pictures of the Kinema Color type directly, by inserting the proper Orange red, and Blue green, filters in front of each of the shutter openings.

Three color separation or four color separation negative may be produced in the same way by using two films and Bi-Pack magazines. Of course, with the Bi-Pack magazine attachment colored pictures of the Du Chrome process may be made directly in the camera, just the same as they are now made in the professional 35mm camera.

A standard Fearless silent movement of reduced size is used to feed the film intermittently past the aperture. A claw pin is used to pull the film down and a pilot pin is used to lock the film during the exposure. This movement is extremely easy to thread and due to simplicity of design and accuracy of workmanship is so silent that only by placing the ear against the frame of the movement can any sound be heard while in operation.

An automatic anti-buckling device is built into the camera. This device controls the tension upon the film as it is taken up into the magazine and prevents any slack film from accumulating in the camera to cause the so-called buckle.

A trap is built into the bottom of the camera so that film may be fed into the camera down through the intermittent movement, over suitable tension rollers and down into the sound recording attachment where sound may be recorded directly upon the picture as it is being photographed.

The recording feed sprocket is hobbled by a special method for securing uniform motion to the film and is controlled by a fly wheel and spring or mechanical



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filter. After recording has taken place the film passes back into the camera case to the take up or feed sprocket and then back into the film magazine. The camera of course can be used without the sound recording attachment.

The shutter opening is controlled by a hand operated adjusting knob, and is arranged for making dissolves or fade in and fade outs. A three-speed dissolve mechanism being built into the camera so that dissolves of 32, 64 and 128 frames may be made. All controls are at the rear of the camera where they may be easily operated.

The New Fearless Magazine

The new Fearless Magazine is being announced along with the advent of the new Fearless Silent 16mm Camera. Over eighteen months' time was spent in experimenting, research, and patent investigation before the Fearless Camera Company had developed a magazine that they feel would be superior to any now on the market.

A camera magazine at first thought appears to present no problems, but with a little thought any cameraman will realize that thousands of feet of film have been spoiled by the magazine. Scratches are one of their worst faults. Practically all buckles in a camera are caused by improperly constructed magazines. Most magazines are extremely hard to thread, and it is almost impossible to keep them clean; and in every case it takes a great amount of labor to dismantle the magazine to remove rollers and light trap for cleaning. All of the magazines now on the market are somewhat naisy.

Realizing all the above defects, the Fearless Camera Company has perfected a new type magazine which overcomes the troubles found in most magazines. The new magazines were designed primarily for silence, serviceability, durability and reliability, and are extremely easy to load.

The main magazine casting carries the take-up rollers and spools. This assembly is carried out an instrument type bearings.

Film is fed from the carrier spool through a free opening light trap where the light is trapped by two rollers which are also mounted on precision instrument type bearings, and by a velvet lining in the throat of the magazine. The rollers are made from duralumin and the roller shafts from steel. The light trap is removable from the magazine. Six screws in the bottom of the magazine hold it in place in the main casting. These may be removed in a few seconds time and the entire trap removed. The light trap assembly can be quickly taken apart by removing four screws from the side of the casting. In fact the light trap can be removed, completely dismantled, cleaned, and re-assembled in less than ten minutes time.

The perfection of design, the materials used in fabrication and the extreme pains taken to insure precision machine work in their construction makes the Fearless Magazine buckle proof, dust proof, and insures against trouble.

Inasmuch as this camera has been developed for the professional cameraman no expense has been spared to make it the finest camera of its kind in the world. Only the finest materials and the highest quality workmanship have been used in its construction and it is presented as the finest 16mm professional camera in the world.



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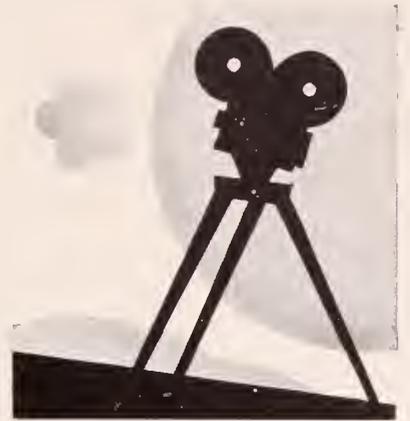
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● As we go to press the S.M.P.E. closes one of their most successful conventions in Hollywood. This gathering brought out some interesting achievements and improvements. The most outstanding as for as it concerns the Cinematographer is "Polarized Light" as demonstrated by Eastman. We will tell you about this in our next issue.



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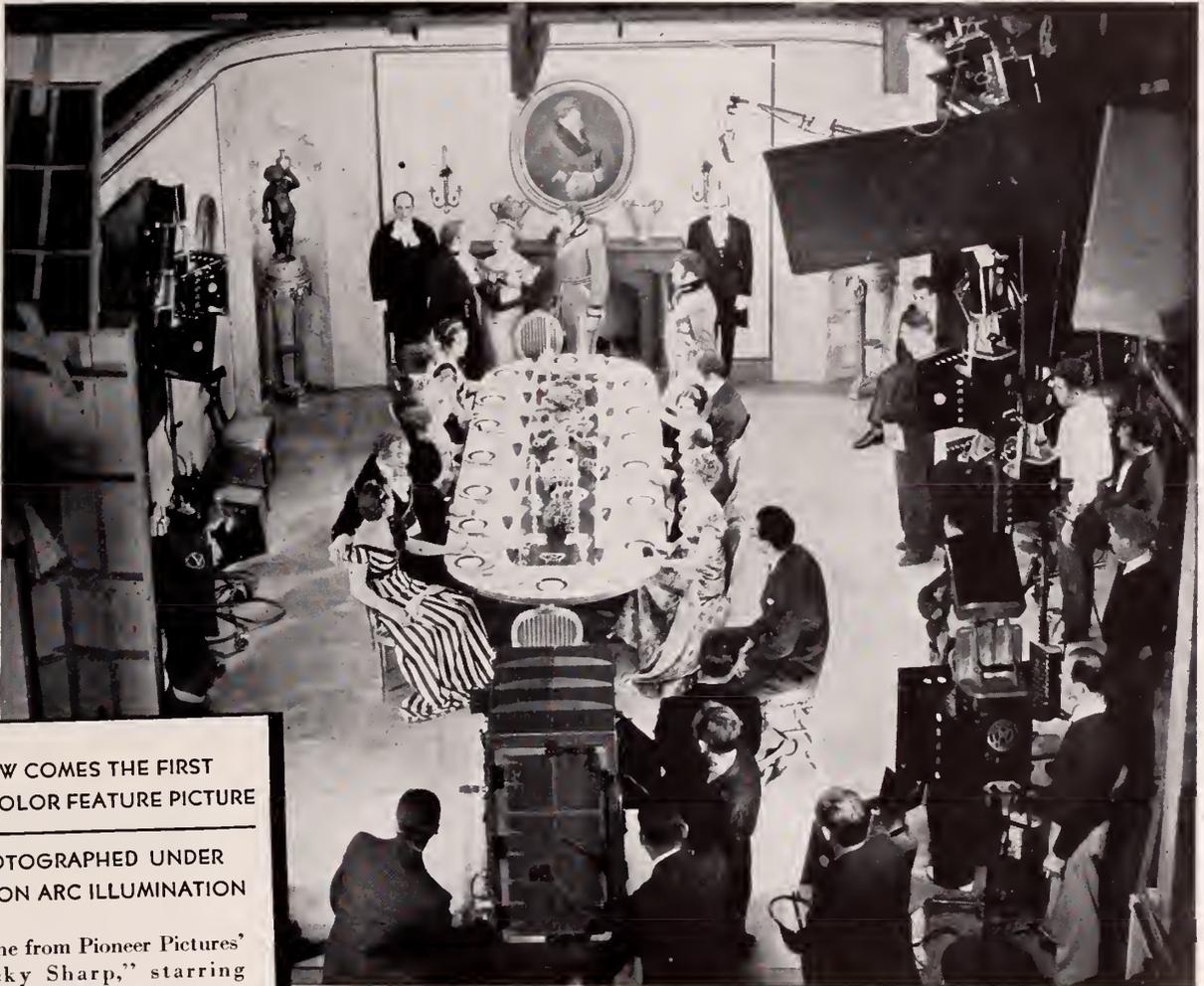
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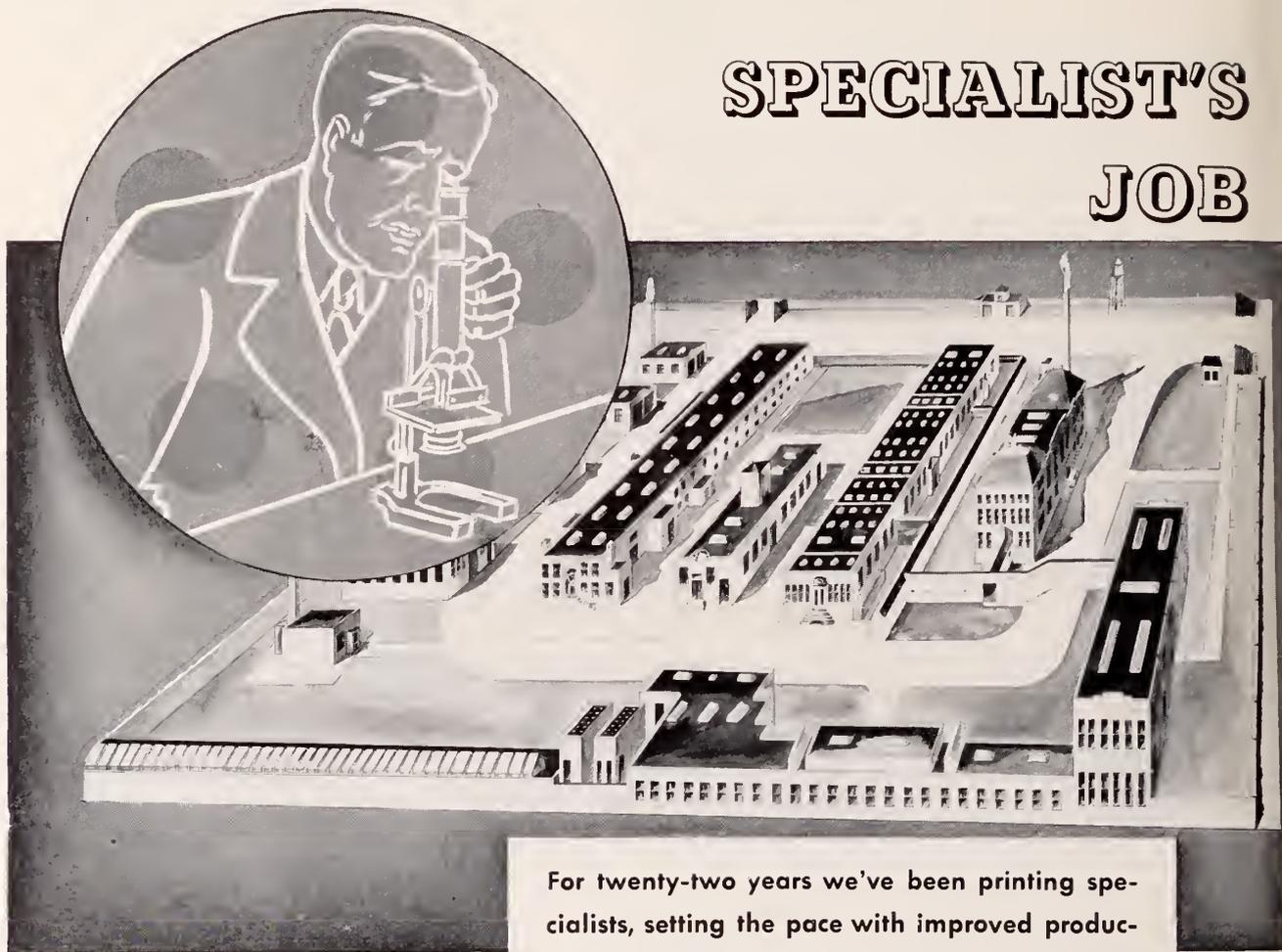
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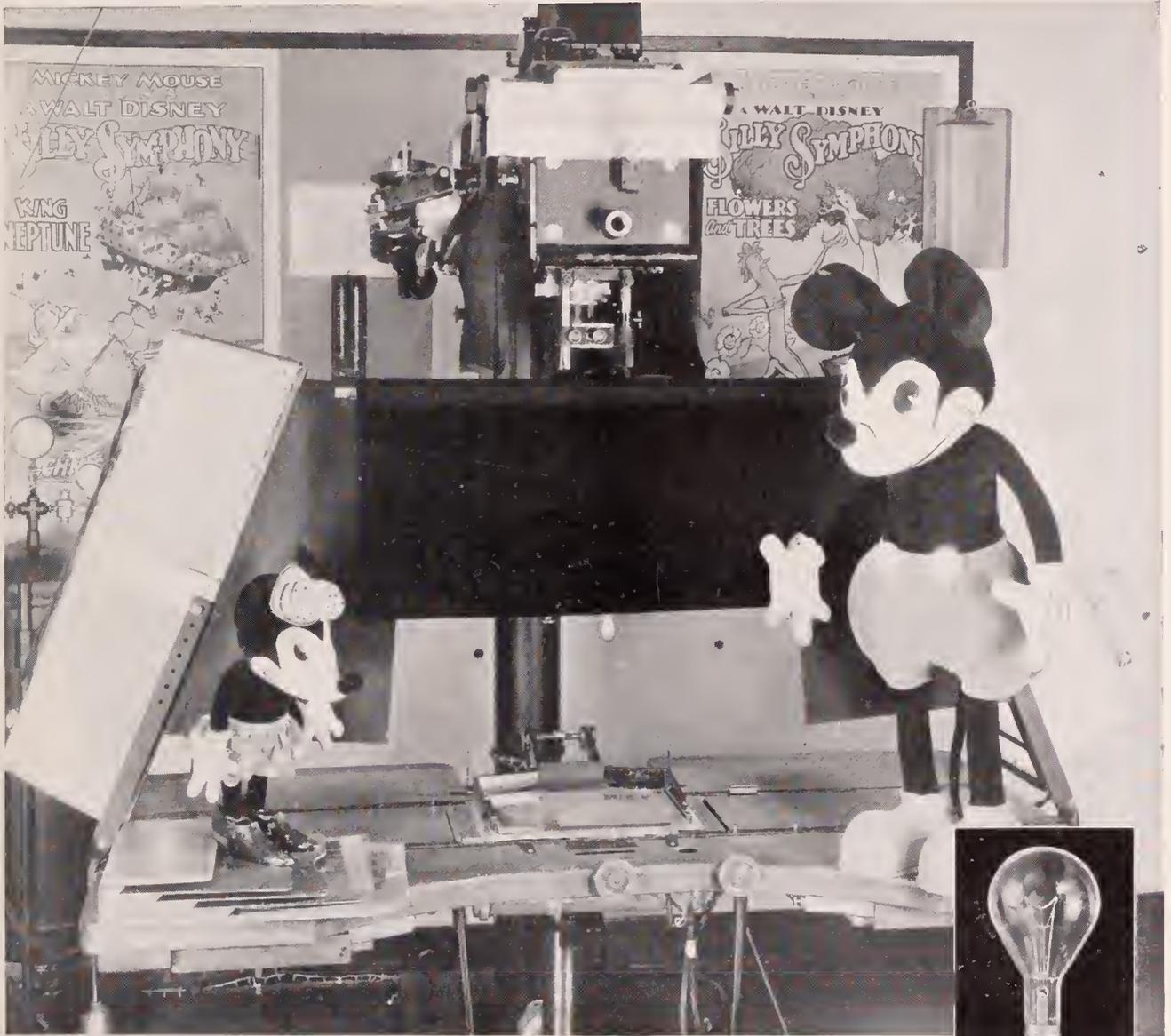


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John Mescall Wins Second Annual A.S.C. Golf Tournament

THE most successful Cameromen's Golf Tournament ever held! Such was the verdict of more than two hundred enthusiastic golfers who participated in the Second Annual Golf Tournament of the American Society of Cinematographers, which was played at the Brentwood Country Club on Sunday, May 12th. Viewed either as a golfing event or as a social occasion, the affair achieved complete success. The score-sheets revealed a notable increase in the ranks of the really expert players, while the presence of the wives and families of many of the players, as well as many non-golfing members, struck a new and pleasing note in the history of cinema golf-meets.

Premiere honors were captured by John J. Mescoll, who reported a score of 78 for the eighteen holes. Wesley Anderson, with a 79, was second, with John Fulton and George Falsey tied for third place with 81 strokes each. Mescoll received the Gold Cup presented by Will Rogers, with a \$65 merchandise order presented by Richard Wolloce. Anderson received the W. S. Van Dyke Silver Trophy, and a \$30 merchandise order. Fulton, awarded third honors when the Tournament Committee played off the tied cords, received the Gold Table Service presented by Moe West, while Falsey received a set of Bobby Jones Irons, donated very appropriately by Marion Davies, whose current production he is presently photographing.

Jock Lebovitz, playing in place of his brother who was unexpectedly called on location the day before, annexed honors in the Guest Flight, closely followed by Wesley Smith and George H. Gibson, all of whom received special guest awards. Two special prizes—Gold Watches presented by O. Henry Briggs and William Germon—for the players who came closest to the cup on the two short holes, were awarded to C. King Chorney, whose ball landed 1 foot 4½ inches from the 8th hole, and Charles A. Morsholl, 8 feet 4 inches from the 16th. Chorney, with fine sportsmanship, insisted that as he was playing only as a guest, he would relinquish his prize to the member next in order, and the award accordingly went to Jack Morta, whose ball landed 1 foot 7 inches from the cup.



W. Anderson, A.S.C.

A special tribute was paid by the A.S.C. to J. L. (Bud) Courcier in recognition of his invaluable services in arranging the tournament. President Arnold, on behalf of the Society, presented Courcier with a gold statuette, and the ovation that followed indicated in no uncertain way that the award met with the unqualified approval of the membership.

The tournament was divided into six flights, exclusive of the guest division, grouped according to scores. The First Flight included those whose scores were between par and 84; the Second Flight, those from 85 to 94; the Third Flight, 95 to 104; the Fourth Flight, 105 to 114; the Fifth Flight, 115-124; and the Sixth Flight, from 125 up. Unfortunately, the space here available does not permit us to give a complete list of either the players or their awards; none the less, the American Society of Cinematographers extends its sincerest appreciation to the many individuals and firms whose generous cooperation did so much to make the tournament a success.

The First Flight, of course, was led by John Mescoll, the winner of the Tournament. The Second Flight was headed by Bert Six (86). The Third Flight was topped by Robert Pittcock (95); the Fourth Flight by Edward O. Blackburn (105); the Fifth Flight by Wolter Kelley (116), and the Sixth Flight by Milton Krasner (126). Lester Shorr (185) received the Booby Prize—and all the honors due a golfer who fearlessly admits his true score.

Improvements for Increased Efficiency

by

George A. Mitchell, Hon. A. S. C.

Research Committee, American Society of Cinematographers

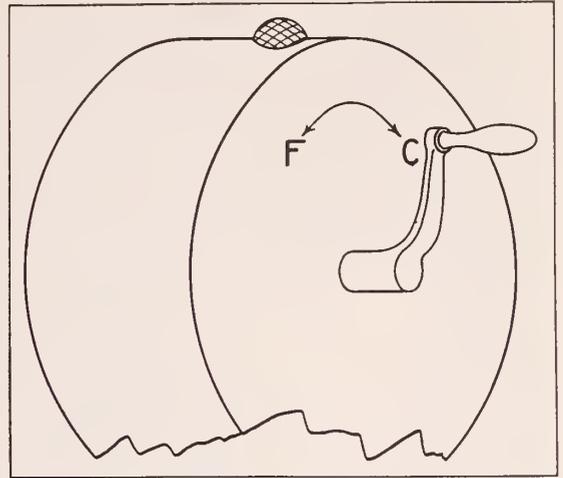
IT HAS long been conceded that the next great changes in photographic technique and equipment would be the introduction of truly practical natural-color cinematography and of really silent cameras. Both of these are more properly problems to be solved in the laboratories of the research-engineers than by the practical workers in the studios; therefore, the technical wing of the Industry has, to a certain extent, at least, relaxed to await the outcome of the battles being fought in the drafting-rooms and laboratories, satisfied that existing equipment and methods were not susceptible of improvement.

The accuracy of such a viewpoint is, however, by no means beyond question. While it may be admitted that the next great advances will be in the two fields indicated, it is by no means certain that there are not other improvements of a practical nature which lie well within the grasp of our practical technicians, and which can be of considerable practical and economic advantage to the Industry as a whole. We are rather in the position of the proverbial individual who could not see the wood for the trees: we are so intimately accustomed to many little details which slow up production and restrict individual efficiency that we ignore them as a matter of course.

The tripod and the conventional "dolly," for example, were long regarded as fundamental technical units; yet the experience of Cinematographers who have made pictures in studios where these units have been supplanted by such devices as the "Rotambulator" and "Velocilator" gives factual proof of the added economy and greater flexibility of the idea of combining these apparently fundamental units into a single, all-purpose camera-support.

More recently, in one studio where a synchronizing-mark was imprinted on the camera-negative by a "fogging-light" at the start of each "take," a considerable saving in the time ordinarily spent by assistant cameramen in checking the operation of these lights was effected by the simple expedient of wiring an electric buzzer in series with the light, so that a visual indication was given of the light's operation.

To achieve such benefits, an improvement need not be startlingly big, nor need it involve the construction of new



Sketch showing proposed light "port" at top of lamp, and markings with "F" representing Flood and "C" position for handle to concentrate light.

equipment. For example, every Cinematographer has had the experience of telling an electrician to turn on a certain light—and seen the "juicer" lose an appreciable bit of time trying to turn on a lamp which was already lit. This is especially so with the reflector-type spotlights generally used for overhead lighting. Tilted down at the angle at which such lamps are usually employed, it is almost impossible for the operator on the catwalk to see whether or not the lamp is lit. The same is true, though to a more limited degree, of certain types used on the stage floor, especially when fitted with diffusers, or on a crowded set.

The remedy is surprisingly simple, and can be applied to existing equipment for negligible cost. All that is necessary is to fit each lamp with a glazed observation-port, either in the barrel of the lamp, or preferably near the edge of the mirror at the rear, where it would be more easily observed by the man on the catwalk when the unit was used for overhead lighting. Such ports could be made by merely punching a small hole in the lamp-housing, and fitting a small window of colored glass, or—even more simply—by fitting one of the red glass tell-tale lenses sold in auto-supply stores for automobile headlights, and costing five cents apiece.

A really surprising saving in ordinarily wasted time should result from even this slight modification, and the resulting monetary saving would more than offset the expense of the change.

Another obvious, but neglected detail improvement would be the general standardization of the screw-threads used to operate the focusing mechanism in both mirror and condenser spotlights. In the mirror-spot, the beam is concentrated when the light-source is at the focal point of the mirror, and spread by moving it closer to the reflector. The reverse, of course, is true in the case of condenser-type lamps, so that if one type is concentrated by turning the crank in a clockwise direction, the other would give exactly the opposite result if the crank were turned the same way. This is bad enough; but not all lamps of the same type have identical operating-controls! One lamp may be "pulled down" by right-handed rotation of the crank, while the one next to it may be "flooded out" by the same right-handed turn. This again makes for loss of time, effort and money in production, for a lamp may be almost perfectly adjusted, requiring but a fraction of a degree more concentration to get the desired effect, when the electrician, having previously adjusted a lamp of different manufacture, will unintentionally give its crank that

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Gregg Toland, A.S.C.

Intensive Preparation Underlies Toland's Achievements

by
Harry Burdick

OF THE many engaging items that may well be recounted touching upon Gregg Toland's contributions to the contemporary cinematographic scene, of immediate timeliness is his employment of the new silent camera. This is the inaudible instrument developed by Mitchell over a period of four years; at a reputed investment upwards of one hundred thousand dollars.

It is a compact, self-contained unit, silent unto itself, using no cumbersome enveloping blimp and permitting the cinematographer to get back on speaking terms, so to speak, with his equipment once again.

For all prevailing picture production purposes, Toland reports, the camera is actually without noise. The designers entrusted it to him for its studio debut. Following a series

of reassuring tests, Toland lensed his Anna Sten success "We Live Again" with it. Results were completely gratifying. The sound engineers announced a total absence of camera noise reaching their delicately attuned recorders.

Toland has employed his silenced instrument—the Galdwyn Studio promptly purchased it—an successive productions including his latest "Les Miserables," which is winning accolades of enthusiastic analytical praise. In each instance, it has demonstrated its built-in trait of performing its tasks efficiently and keeping quiet about it.

On several occasions, he has extended to visiting confreres the experience of making tests. These fellow-cinematographers, in turn, have found the camera entirely silent in their service.

For one so vitally an artist at heart and blessed with a vivid value of dramatic presentation, Toland is surprisingly original and ingenious on the mechanics side of his profession. He is carrying on a madicum of trail-blazing in another direction, a simple procedure of merit warranting the prediction of its early adaptation as a standard studio routine.

He has conceived a small test-board for identifying to the laboratory the development desired to establish his sought-for effects on negative tests. The board is approximately twelve by five inches in area and is photographed at the start of each scene, much in the fashion of the slates of old. On the board are code insignia, nine in number, indicating Night, Day, Dusk, Dawn, Effect, Semi-Effect, Normal, Force Development, and Under-Development.

The worth to the laboratory of such scene-labeling is obvious. Results testify eloquently of its effectiveness. But Toland carries his laboratory co-operation even further. On each scene, on the set, he has a contact man—a laboratory liaison officer, who absorbs the mood, spirit and key of the scene and relays this data to the processing technicians. As may well be expected from such continuity of purpose, what Toland intends to capture on his celluloid is present in full measure when the negative emerges from his laboratory.

A marked depth of sincerity is manifest in all of Toland's procedure in taking to the screen an adequate cinematographic rendition of the drama that is unfolding. He devotes as much time, when conditions permit, in preparation as in the actual shooting.

The exceptional merit of his current "Les Miserables" is evidence of the efficacy of his methods. Fifty-four sets were utilized in this production. As each was constructed, well in advance of schedule, Toland visited it. He called for his lights and—radical departure from general technique—a squad of painters. Right on the daisy cloth, by his instructions, the painters' spray guns put in the shadows, accentuated the blacks, definitely determined the grays, brushed in highlights; providing a supplemented foundation for his lights to play upon.

As to lighting, he uses large units and few of them, as preferred to smaller groups in wider number.

He devoted, by average, in excess of three hours on each set in preparation for his actual shooting; many of them extending into dawn. But when the characters began their portraiture before his sets, he was ready. He did one thousand fifteen set-ups in thirty-six days; which averages twenty-eight each day. Ninety percent of the footage exposed found place in the picture when screened. He saved fifteen thousand dollars under budgets on sets alone.

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At left, Carl O. Peterson, radio expert and on occasion cinematographer, and at right John L. Herrmann, A.S.C., veteran Paramount cameraman who filmed Byrd's South Pole expedition.

On Location at the South Pole

by
Wm. Stull, A.S.C.

JOHN Herrmann, A.S.C., and Carl Peterson have just returned from location at the Bottom of the World. Ten thousand miles away from Hollywood, 2,500 miles from the nearest outpost of civilization, they spent eighteen months as members of the Second Byrd Antarctic Expedition, battling polar storms and temperatures of 65 degrees and more below zero, to bring back a thrilling successor to the Academy Award-winning "With Byrd at the South Pole."

In many ways, it was the most unique location in the history of filmdom. Not recreating history, but recording history in the making, entrenched at the edge of a vast empire of ice greater than the United States and Mexico combined—the last blank space on the maps of the World. Herrmann and Peterson were in every sense of the word

members of the Expedition; not only were they the official camera-reporters, assigned by Paramount News to "cover" the story, but each performed definite duties as members of the exploring party. Herrmann, veteran of the News-reel service and sometime Chief Electrician and Photographer in the U.S. Navy, was not only Chief Cinematographer, but Projectionist, Electrician and assistant-caok. Peterson, sea-going radia expert and officer of the Norwegian and U.S. Navies, carried the "eyes of the world" aloft on the flying trips, and did double duty as the party's flying radio-officer. Between them, they photographed over 150,000 feet of film, the last of which has just been reeled from the developing machines of the Paramount Studio Laboratory.

"We soon got used to the temperature," says Herrmann. "During the winter months, when it got really cold, it was, of course, too dark to make exteriors, save for an occasional, flare-lit scene or two. In the summer months, it usually warmed up to zero—and sometimes the mercury even climbed above the freezing-point. Just the same, the temperature gave us plenty to think about, photographically. Most of our scenes were shot on Super Sensitive film; the manufacturers had advised us to allow a stop to a stop-and-a-half more for every 70 degrees drop below normal American temperatures. In practice, we opened up from two-and-a-half to three stops, and found it about right. Our average exposure, using an Akeley camera with its 230 degree shutter wide open, and an Aero 2 filter, was f:8, on Super Pan film! In other words, the extreme cold slowed the fast film down to approximately the same speed as regular Pan. In addition, we used quite a bit of special Background Panchromatic negative, and several thousand feet of Infra-D; the latter, incidentally, we weren't able to use fully, because this climatic slowing, combined with the generally rather poor light-conditions, made it impossible to use the heavy filters necessary. In fact, though we carried a complete assortment of gelatine filters, we hardly used any except the old dependable Aero 2. Incidentally, it is interesting to know that, while the extreme temperatures slowed our film, it did not produce any lasting effect; for when we returned to normal temperatures in New Zealand, we found that the film-speed had also returned to normal.

"Perhaps the strangest thing was the change in our photoelectric exposure-meters. We carried half-a-dozen or more in the party, for in addition to ourselves, the Associated press 'still' man and the aero mapping-cameraman, there were many 'Leica' enthusiasts in the group. Personally, I use a meter regularly, and swear by it. But not down there in the Antarctic! I don't know whether it was the temperature, the proximity of the magnetic pole, or the peculiarly deceptive value of the light; but at any rate, not one of the meters would give an accurate reading! Every one of them gave an off-scale reading; the only way we could use them was to allow three full stops over the indicated reading. After the first few hundred feet of film, I reluctantly discarded the meter, and guided myself entirely by tests. These, I developed—usually a day or so after shooting—in a little dark-room I made out of ice-blocks, and using ordinary trays and 'Tabloid' developer, or the old Eastman D-7 A-B-C formula. The meters, by the way, also returned to normal as soon as we got back to more normal temperatures.

"The extreme cold played the old scratch with our film in other ways, too; made it brittle, so that loops were

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SOME

FAST "PANS"

"The Things They Do at M.G. Mayer"

● It looks as though M. G. M. and Warner's think they are running a baseball team, instead of grinding groanies. A certain blonde star who recently graced the Burbank plot with her enriching presence, demanded that she have her favorite film feeder standing behind that infernal machine. Rother than have the lady dissatisfied, the powers that be made a deal. George Folsey is now at Warner's and Ernie Haller is M.G.Ming it. It's just a temporary trade, though . . . at least for the present.

"Anything for a Lough"

● Ray June is back on the "China Seas" set after having flooded his flu . . . (I think that's the proper remedy). Ray is so engrossed in his work these days that he can't even hear the signals. . . . To prove it . . . There is a sequence in the "pitcher" that calls for one of the better hams to stop a wet sponge with her face. . . . Ray was showing her just where to stand when the director called rehearsal . . . and he did not notice Ray, who was stooped over, marking the emotines foot positions . . . as Ray straightened up, the order was given to fire. . . . Ray, of course being a gentleman, protected the lady and made an excellent stop . . . right between the eyes. . . . Now Mack Sennett is trying his best to interest June in a contract . . .

"Poor Poul?????"

● Paul Vogel has gone on and done it . . . regardless of advice and rumors to the contrary, Paul and the former socialite, Patricia Daley, middle-aisled it the other weekend . . . We know, because Len Smith, erstwhile golfer, prsonality boy, and mass of muscle . . . told us . . . Len threw a binge for his brided buddy over at the Bel Air Bay shack . . . among those getting numb enough to associate with the happy groom were Ollie Marsh, Ray June, Bill Daniels, Hal Lipstein, Charlie Lang, and Pev Marley. . . . You have our best wishes and 'Bon Voyage' on your matriphonial cruse, Paul, . . . and good wishes help after a few years . . . we know . . .

"To Be or Not To Be"

● And while we're on the subject of mergers, the way Horkie Smith finolly took to himself a wife is a classic . . . Harkie and the now safe and sound Mrs. Harkie had intended to hook the shackles for some time . . . just when they had set the date, Harkie was sent to China to crank "Good Earth" . . . as soon as the boat docked back in the States, Harkie dashed ashore and corraled his lady love . . . o few quickly answered questions and it had been done . . . Harkie now had a wiff . . . but no honey-moon . . . three doys later Harkie was again called before ole Masso Arnold and told to be on his way to Tahiti to "yes" Charlie Clarke on "Mutiny on the Bounty" . . . two months later Harkie returned to his waiting and watchful wiff . . . the happy couple had just said hello . . .

when Harkie again was called . . . this time it was back to Tahiti for retakes . . . but . . . Frank Lloyd and Charlie Clarke decided that if things kept up, the Smiths would have to win their first in a raffle . . . if there was to be a first. Frank and Charlie made a paoi and sent the now frantic "flutter half" along with her lord and master. . . . And this department thinks Frank and Charlie deserve all the orchids in the deck . . .

"Dust Off the Initiols Boys"

● A certain button pusher who was taken over by ole Uncle Sammy to supervise and create jobs for the unemployed camera men and "stugio" technicians and who, by the way, is now 'tops' with all of the better "button leaner oners" because of the absolutely swell way in which he has handled the less fortunate bulb squeezers, was very busy the other A.M. in getting his many "yessers" started on the day's loafing . . . one of the more ambitious ones kept asking for something to do. . . . "Do you want me now, Art?" he would ask every time the super would look his way. . . . Finally the bass became a little irate over the fellow's insistence . . . in an attempt to squelch the pest, the super walked over to him and in a low tone said, "Don't call me Art. Somebody might think you know me . . . Call me A.J." . . . And if that isn't a classic we might pass on the one that's been floating around about Tony Gaudio . . .

"Push 'Im In, Tony"

● Tony and Mrs. Gaudio had wound up the family flivver and were touring down the Blvd., in search of a new spot to take on a few proteins, the other after-mid-night . . . suddenly Tony saw a sign reading "Italian Food . . . All you can eat . . . 50c." Tony pulled up to the curb. "Come on a Mom . . . heresa where we eat." When the first course of "Wap yarn" had been set before the Gaudios, the proprietor came up and offered his greetings. When he had been assured that everything was just fine, he left Tony to his gastronic enjoyments. . . . About an hour later the proprietor again approached the table . . . this was after Tony had devastated his eighth plate of spagett . . . "Pleasa mister," the proprietor begged Tony, "if you quita eating now, I no charga you feefty cent."

"Short Shots About Things"

● Herb Fisher and Hal Marzorati have challenged Eddie (Handicap) Hannan and Bab Koke in a divot duel to the finish, on the Rancho cut and cuss field. The weapons will be mid-irons at as many yards as possible . . . George Folsey was seen at the L. A. Tennis club the other after while stopping balls with variaus parts of his anatomy. George was once one of the best amateurs on the Coast a few years ago, but now he's netting next to nothing . . . Three of the better miniature maniacs are Bill Walling, Gene Richey, and Harold McAlpin; Bill goes in for model aircraft and motors; Gene prefers racing boats; and Harold satisfies that suprressed feeling by building tiny choo-choos.



Elmer Dyer, A.S.C.

"Lighting" Problem In Air Photography

by
James L. Fritz

ELMER DYER assures us that the aerial cinematographer's life is no series of white fleecy clouds and pink horizons, but is usually comprised of a series of events which require an iron nerve and a fathomless knowledge of cinematography. These requirements on the part of Dyer proved their necessity during the photographing of "The Lost Horizons."

In this production, the proper lighting was the most difficult to master, due to the fact that a single shot might cover all of the territory from the top of Mount Whitney, which is the highest point in the United States, to the pit of Death Valley, which is the lowest point below sea level. The camera plane covered this distance in twenty minutes, and the contrast in lighting, setting and backgrounds was so terrific that every ounce of Dyer's cinematographic ability was necessary. From the freezing cold altitudes of twenty thousand feet where the cinematographer's fin-

gers became frostbitten and his cheekbones froze, the plane would drop to a bare thousand feet above the desert. At this level, the thermometer would register somewhere in the neighborhood of 120 degrees, and the heavy flying togs which were necessary in the high altitudes, Elmer tells us, made him feel as if he were in a Turkish Bath. Aside from the physical discomfort, caused by these sudden drops, Dyer spent anxious moments endeavoring to keep his lenses clear. A sudden change in altitude had a tendency to cause a fog to form on the glass of both the finder and the lens. Although this fog did not obscure the image, it was still dense enough to produce a softening effect.

Another handicap which Dyer encountered, was the glaring light reflections from the salt beds of the dry lakes. These gleaming masses of white sodium, when viewed from the air, appeared to the camera eye as giant mirrors. A shooting schedule, which began at seven-thirty in the morning, ended at nine-thirty in the morning, began again at three in the afternoon and continued until the light failed, proved successful in combatting the handicaps in lighting. Even then, Dyer states, the light was so brilliant that it was necessary to use Infr D film, to obtain the night effects.

The camera itself proved to be another handicap. At low altitudes, a heavy oil had to be used in the moving parts, because of the mighty sand-storms which blow across the desert during this season of the year. At high altitudes, this oil would become so stiff, that the camera would freeze solid. After several experiments with various types of oil, it was discovered that the only way to keep the camera moving when the plane reached an altitude of more than fifteen thousand feet, was to take all of the oil out of the camera and on the parts where oil was absolutely necessary, a very light whale watch oil was used.

Dyer, however, points out that there was one redeeming factor. Both he and his pilot, Frank Clark, had been over practically the same territory twice before. The first time was for Fox, during the filming of "Change of Heart," and the second time for Paramount's "Thirteen Hours By Air." Therefore, with the previous knowledge and experience obtained on these two productions, Dyer managed to photograph all of the air sequences in twenty-five thousand feet of film. His camera plane was a Lockheed Vega, powered by a super wasp motor, and was designed especially for Dyer. It cost Columbia Studios exactly \$1,650 to reconstruct the cabin and build the necessary doors, both in the floor and sides of the plane to shoot through.

Dyer claims to be one of the few cinematographers in Hollywood who was forced into his present profession. It all happened back in 1916. Elmer loaned a man \$150 on a movie camera. The man couldn't pay, so Elmer was forced to foreclose on the camera. Dyer then points out that the only way he could see that he could ever get his money back, was to become a cameraman, and he figures that now he is just about even. He received his first chance as an aerial photographer in 1920, at the Universal Studios. Milt Moore, the cameraman, who was chosen to film "The Great Air Robbery," became extremely ill, every time the plane left the ground. Dyer volunteered for the position and was immediately token. This was the first picture ever made in the air and started Elmer on a career of aerial successes.

He has spent more than four thousand hours in the air, and yet he has never crashed or been injured in an airplane. Still, on nearly every assignment he has received to film on land, he has ended up in the hospital. After the injuries Dyer received on the shooting of "Six Day Bike

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PHOTOGRAPHY

of the MONTH

"GOLDDIGGERS OF 1935" (Warners)

George Barnes, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 18, 1935): "Top-notch describes the photography of George Barnes. There are some startling trick effects."

Daily Variety (April 18, 1935): "Photography of George Barnes is in line with this lenser's usual excellent work."

"THE COWBOY MILLIONAIRE" (Fox)

Frank B. Good, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 18, 1935): "Edward Cline's direction is first rate, as is Frank Good's photography and the mounting generally."

Daily Variety (April 18, 1935): "Excellent photography by Frank B. Good adds greatly to the quality."

"LADIES LOVE DANGER" (Fox)

Daniel B. Clark, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 19, 1935): "Daniel Clark's photography was top flight in a picture that called for plenty of tricky night interiors and discriminating lighting."

Daily Variety (April 19, 1935): "Production has been handsomely mounted with Daniel Clark's camera."

"BREWSTER'S MILLIONS" (United Artists)

Barney McGill, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 19, 1935): "Cutting and photography are first-rate."

"THE WHITE COCKATOO" (Warners)

Tony Gaudio, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 22, 1935): "Tony Gaudio's photography is helpful in sustaining the picture's theme."

"DINKY" (Warners)

Arthur Edeson, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 22, 1935): "Photography by Arthur Edeson very good."

"GOIN' TO TOWN" (Paramount)

Karl Struss, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 23, 1935): "Karl Struss proves again he's an ace cameraman."

Daily Variety (April 23, 1935): "Photography by Karl Struss is excellent."

"VILLAGE TALE" (Radio)

Nick Musuraca, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 23, 1935): "Musuraca's photography contributed masterfully to the depressing atmosphere of the story."

Daily Variety (April 23, 1935): "Nick Musuraca has done a good camera job."

"THE INFORMER" (Radio)

Joseph August, A.S.C.: Directing Cinematographer

Daily Variety (April 24, 1935): "Photography of Joseph

August is splendid. Lighting is artistic and eye-pleasing."

Hollywood Reporter (April 23, 1935): "Joseph August's camerawork and the splendid lighting are responsible for a large share of the picture's power. Composition after composition should be framed and hung."

"THE CALL OF THE WILD" (Twentieth Century)

Charles Rasher, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 27, 1935): "Charles Rasher touches a new high in his photographic conquest of the woods, the snow-clad wilderness and the eternally white peaks of the northland. There is dramatic as well as artistic value in every one of his master scenes."

Daily Variety (April 27, 1935): "Charles Rasher's photography is perfect."

"WEREWOLF OF LONDON" (Universal)

Charles Stumar, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 27, 1935): "Beautifully photographed by Charles Stumar."

"OIL FOR THE LAMPS OF CHINA" (Warners)

Tony Gaudio, A.S.C.: Directing Cinematographer

Hollywood Reporter (April 27, 1935): "Tony Gaudio's photography is fine throughout the entire picture and the atmospheric shots look genuinely good."

Daily Variety (April 27, 1935): "Tony Gaudio's photography is excellent in its adaptation to the subject and in stressing the atmospheric elements."

"THE FLAME WITHIN" (M-G-M)

James Wong Howe, A.S.C.: Directing Cinematographer

Hollywood Reporter (May 2, 1935): "Jimmy Howe's scenes up to his usual standard."

Daily Variety (May 2, 1935): "James Wong Howe has photographed well."

"AGE OF INDISCRETION" (M-G-M)

Ernest Haller, A.S.C.: Directing Cinematographer

Hollywood Reporter (May 2, 1935): "Haller's photography is okay."

Daily Variety (May 2, 1935): "Photography and production are very good."

"BLACK SHEEP" (Fox)

Arthur Miller, A.S.C.: Directing Cinematographer

Daily Variety (May 3, 1935): "Arthur Miller's photography is swell."

"\$10 RAISE" (Fox)

Harry Jackson, A.S.C.: Directing Cinematographer

The Film Daily (May 4, 1935): Photography, "Fine."

"SWELL HEAD" (Fox)

Joe Valentine, A.S.C.: Directing Cinematographer

The Film Daily (May 4, 1935): Photography, "Good."

EXTRA SPEED

SUPER X "Pan" is much faster than regular Super Sensitive. Under normal conditions its extra speed gives definitely better shadow detail...general improvement in quality. And under adverse light it often means certain success instead of probable failure. Combining this great speed with startling fineness of grain, Eastman Super X marks a substantial advance in motion picture photography. Eastman Kodak Company, Rochester, N.Y. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN SUPER X

PANCHROMATIC NEGATIVE



Adjustment for Dolly Head

● Gregg Toland, A.S.C., recently devised a novel mechanism which greatly increases the flexibility of his camera equipment. Fitted to a standard Fox-Feorless "Velocilator," the device consists of a flat bedplate, similar in principle to a lothe-bed, upon which travels a flat carriage. Upon this carriage is mounted a "top-hot," which in turn carries a conventional friction-type pan-and-tilt head. The bedplate may be rotated, though its normal position is at right angles to the velocilator's croneorm. By means of a toothed rack on this plate, the carriage may be traversed laterally through a distance of over a foot and a half on either side of the center-line. This motion is secured by

operating a crank located conveniently at the rear of the carriage; a locking mechanism is also provided.

In practice, according to Toland, the device greatly facilitates the making of difficult shots. Travelling-shots, for example, are more easily aligned, and failure of the actors to occupy their exact positions in such shots can often be remedied by a slight lateral movement of the camera. Obviously, the device simplifies set-ups in which the camera must come close to the wall of a set, or extend over a desk or table. Toland has used the device on several of his recent productions, including "Les Miserables" and "Public Hero No. 1."

Lightweight Blimp Has Many Improvements

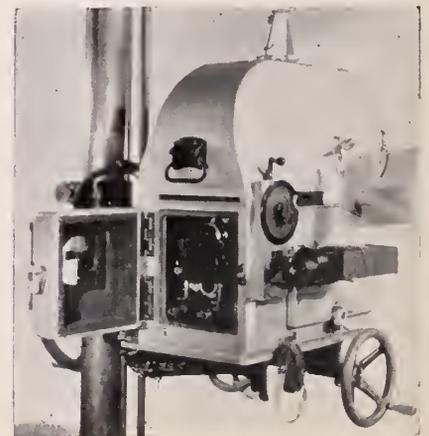
● A new lightweight camera blimp has recently been placed in service at the Metro-Goldwyn-Mayer Studios. Like previous MGM blimps, it was designed

by John Arnold, A.S.C., Head of the Studio's Camera Department. In appearance, the new unit is similar to the earlier designs in use at the studio, but

features many detail improvements, and the lowest weight so far achieved by camera-housings of this type. Through the use of improved aluminum-alloy castings and pointstoking design, the weight has been reduced to slightly over a hundred pounds—a figure which is expected to be further reduced by detail improvements. The device is somewhat more compact than its predecessors.

The familiar features of MGM blimps, including sturdiness, accessibility, focusing and parallax-correcting finder, are retained. The focusing scale is pre-calibrated for 25, 35, 45, 50, 75mm and 4¼-inch lenses, with unusually large and easily-read calibrations, and the mechanism is so designed that any four lenses may be carried on the turret of the camera, and interchanged almost as readily as in the pre-talkie era; the finder is synchronized by means of quickly changed cams.

The doors are fitted with less cumbersome locks and positive, quick-release catches which hold them firmly when open. The front door of the blimp is hinged to swing horizontally rather than vertically, and the window is masked by accurately-cut bokelite mottos, resembling the familiar finder-mottos, but opaque. An ample bakelite sunshade can be fitted externally, while a green vizor is double-pivoted to swing down over the finder, to shade the Operator's eyes when necessary. The fogging-light and an indicating buzzer are wired in series, so that an audible indication is given of the former's operation.



Intensive Preparation Underlies Toland's Achievements

Continued from Page 240

When previewed at the Chinese Theatre, another innovation, "Les Misérables" was at once nominated as an outstanding contender for the year's cinematographic laurels. It is done in very low key throughout—indeed one of the lowest in key that has ever been made. Huga's immortal story of Valjean incessantly haunted by the cruel Javert is not a tale of gaiety. Ten thousand feet done in so low a key might well be expected to be depressing to an audience. So, at skillfully timed intervals, Toland relieves the mood by interspersing bright and brilliant scenes; thus achieving a deft dramatic balance. The period, France 1800, is realistically conveyed by masterful, and well prepared cinematographic suggestion.

His treatment of closeups is a revelation in artistic conception and courage. There are many of them in "Les Misérables," some flashing in brief cuts of two and three feet. They appear to be absolute nadir in key, only vivid bars of brilliance slashing across faces at surprising angles alleviating utter depth of mood.

Toland is the truer type of cinematographer who harbors the belief that "camera man" is a wretchedly weak mis-

namer for the practitioner of the myriad arts of cinematography. It smacks too flatly of the machinery involved. He likes to dismiss all thoughts of mechanics and physics and chemistry and such tangible things which comprise the media of his expression.

He is a story-teller, a maker of dramatics. His sphere is with the director and the art director. With them, he plots his drama's development. His preliminary preparation is exhaustive, thorough. His first scene creates and establishes mood. His every successive scene

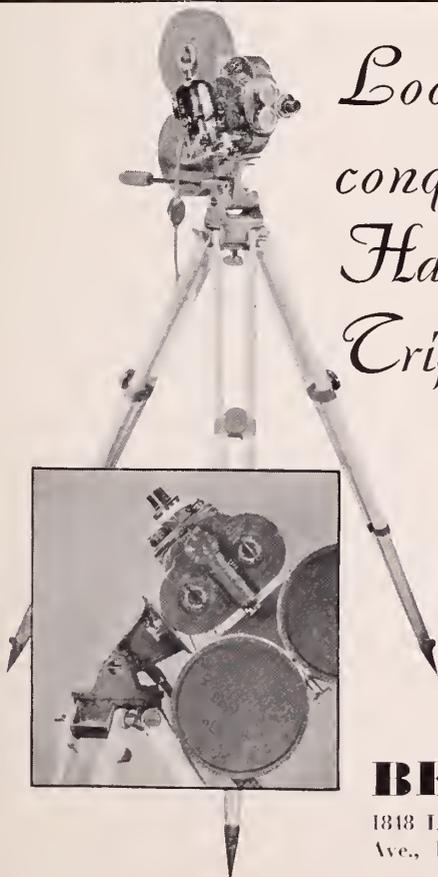


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So unusual degree of preliminary preparation presents no impediment to full exercise of his versatility. The same measure of calmly plotted charm and appeal, of keenly etched mood and cinematographic atmosphere, stand forth as noticeably in one of his Eddie Cantor

brilliant extravaganzas, as in his fine dramatic drawing "Les Miserables."

A comparatively young man, and Gregg Toland looks for younger than his total of busy years, he finds himself established well within the charmed circle of Hollywood's foremost cinematographic exponents. His talents have won him, at this writing, a reward unique in the annals of his profession.

He has just affixed his signature to a contract, an air-tight contract, with no optional renewals, calling for his services for the next four years—two hundred and eight consecutive weeks of cinematographic creation.

ON LOCATION AT THE SOUTH POLE

Continued from Page 241

continually breaking. Of course, we kept the film in an ice-house, and when we made interiors, we slowly warmed the film for several days, gradually bringing it up to the temperature inside the houses, before we shot. We carried a small set of portable Photoflood lighting-units, and a Photoflood strip, which we supplied from two portable 1-Kw. gasoline-driven generators. As we had more, and better, lighting equipment, I think our interiors will be a bit better than those brought back by the boys on the first expedition, who had only a couple of twin-arc broads.

"Right here, I want to pay tribute to Harry Ensign, Ray Wilkinson, and the Paramount Studio Laboratory. Our first few thousand feet went through a news-reel lab, three-minute 'dynamite' soup, and so on; the rest has gone through here at the studio. The difference is so great that I can hardly believe I photographed some of the stuff. If the picture is a good job photographically, the lab crew will deserve a lion's share of the credit.

"Our camera-equipment was rather limited; at first, just an Akeley and several hand-cameras; later, the studio sent down a Bell & Howell for the background work. In the warmer weather—we called anything above about 15 degrees below zero warm—we lubricated the cameras with special aircraft-instrument oil. When it got really cold, we had to drain the cameras, dry them out thoroughly, and run them dry; otherwise, the oil would have frozen and jammed them up tight. We worked in silk gloves, of course, to keep our hands from sticking to the metal parts, and kept the cameras in an ice-house. When we wanted to make interiors, we took them indoors and baked them—literally—in an oven until every bit of moisture was dried out.

"Contrary to usual exploring practice, we did not bundle ourselves up in furs; instead, we wore specially made cotton windbreakers. The closely woven cloth

kept out the cold winds just as well as fur, and was much less bulky. The only time we wore furs was when we were flying, or doing similar tasks where we could not move around."

Peterson, a member of the First Expedition, joined Paramount News some time before the second group started, and mastered aerial cinematography so that he could do double duty as radio-operator and cameraman on the flights. "To be useful on such an expedition as this," he says, "a man must not only be a qualified specialist in some line, but, if possible, proficient in more than one job. Take my own case, for example; if I had not been a qualified radio-operator, nothing could have gotten me a place in one of the planes, for every ounce lifted from the ice must do useful work. On the first expedition, Co-pilot Harold June had to handle the photography—as well as flying and radio—be-

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cause both of the cameramen were dangerously heavy.

"All told, I had more than 70 hours in the air down there in the 'Home of the Blizzard.' The weather was much less favorable than during the first expedition, but the ships spent more time in the air. Much of the time, everything was overcast, and visibility was about zero. In every direction—up, down, and to all sides—was just a milky whiteness. This made flying difficult and dangerous, and our aerial pictures were very flat. We had several bad moments; once, out over the Rockefeller Mountains, the part motor of the big 'Condor' went dead—out of gas. Unless June had been able to pump fuel from another tank and start the motor quickly, before it froze, we would have crashed, five hundred miles from 'Little America.' These moments while the plane munched down, half its power gone, and June feverishly pumped gasoline, were without doubt the longest and worst of my life. But I think the most dangerous flight I made was the second one. Pilot June, the Admiral, and I went off in the big 'Condor,' taking off from the open sea to cruise forward over the pack-ice in search of an open lead through which the S.S. 'Jacob Ruppert' could reach Little America. A forced landing could only mean a crash, with no hope of rescue or escape across the broken ice-pack. To make things still more unpleasant, the murky weather forced us to fly low, 'hedge-hopping' over icebergs. I have never known the Admiral to take such chances; but it was necessary, for we had to get the 'Jacob Ruppert' to shore and unloaded before winter set in.

"On the overland trip which went 500 miles inland to build the advance base in which the Admiral spent the winter, we had the largest land party that has ever made a polar journey; ten tractors, carrying tons of equipment, and a score of men. We had to lay down caches of food and fuel as we went, and for every hundred miles we advanced, we travelled 1,400 miles back and forth with supplies!"

Improvements for Increased Efficiency

Continued from Page 239

fraction of a turn in the wrong direction, necessitating complete readjustment of the light.

Obviously, the ideal solution for this would be complete rebuilding of the operating parts of all lamps to establish a definite, industry-wide standard. Far obvious practical considerations, however, such a step is not feasible; but a simple, inexpensive remedy nevertheless exists. This is simply to mark each lamp, plainly indicating by means of an arrow and the letters F and C which way

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the crank should be turned to flood and to concentrate the beam. Such markings could be made with painted or stencilled letters at practically no cost, and would undoubtedly achieve a beneficial saving of time and money.

Growing out of this is an idea which should, I believe, be given serious consideration in the design of any new

lighting units. Granting the desirability of working toward an eventual standardization of threads and operating mechanism, and the incorporation, even so, of a visible indicator, would it not be well to go a step beyond this and provide a calibrated indicator, by which a lamp could be set accurately at "1/2 flood," "3/4 concentrated," and so on? Such an indicator would not involve any basic changes in design, nor complicate the problems of manufacture, yet it would make the lamp a definitely more practical unit for commercial use.

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Lighting Problems In Air Photography

Continued from Page 243

Rider" for Warner Brothers, he made a solemn promise that he would never photograph anything again, except in the air.

On the other hand, Dyer has received many narrow escapes, during the shooting of his numerous air pictures. The first time was on the production "Paul Jones, Jr." for Fox. Dick Grace, who was the camera pilot on this production, cut the motor and asked Dyer if his belt was fastened. Elmer, thinking the pilot was referring to the belt which was holding his trousers, assured him that it was well fastened. Grace, then, without warning, threw the plane into an almost vertical power dive, and the only thing that kept Dyer from plunging into oblivion was the fact that he had a secure hold on his camera, which was bolted firmly to the side of the ship. Another hair-raising incident took place during the filming of "Hell's Angels." It was necessary for the camera plane to fly very close to the ground for close-up shots of the crashes. Dick Grace was again Dyer's pilot. As the camera plane swept low over a diving ship, a piece of wreckage from the crashed plane flew into the air and struck Grace on the head, knocking him unconscious. Dyer claims that he wasn't afraid during the time, but he was merely worrying about how his wife was going to spend his insurance. However, today finds Elmer hale and hearty and seeking further aerial triumphs.

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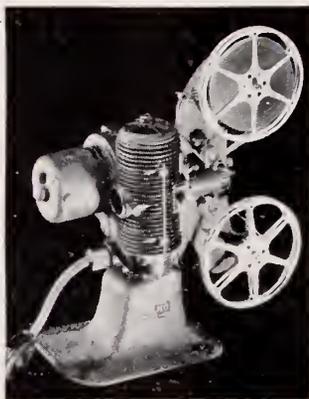
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The Filmo Straight Eight's lens is an F2.5 anastigmat of 1/2-inch focal length, and can be removed in a jiffy for using 1-inch and 1 1/2-inch lenses for telephoto effects. There are four film speeds—8 frames to pep up sluggish action, 16 for normal, and 24 and 32 frames for s-l-o-w movies.

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Model B case, accommodating camera alone, with shoulder strap and with slits for attaching to belt. Heavy brown leather, unlined. Price, \$3.



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this issue

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AMATEUR MOVIE SECTION

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Next Month . . .

● We have what we consider an exceptional treat for the readers of our amateur section, next month; a contribution from Charles Herbert, A.S.C. Herbert is the man who shot so many of the Magic Carpets which you admired. He tells you in his inimitable and straightforward style how to shoot a simple scenic, the kind you will run into on your vacation this summer. It's a documentary that you'll be proud of as long as you live. Many subscribers of this paper consider one of Herbert's articles worth the entire subscription price. He speaks from experience, still he holds the amateur's viewpoint. You'll enjoy Herbert next month. Of course there are others.

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

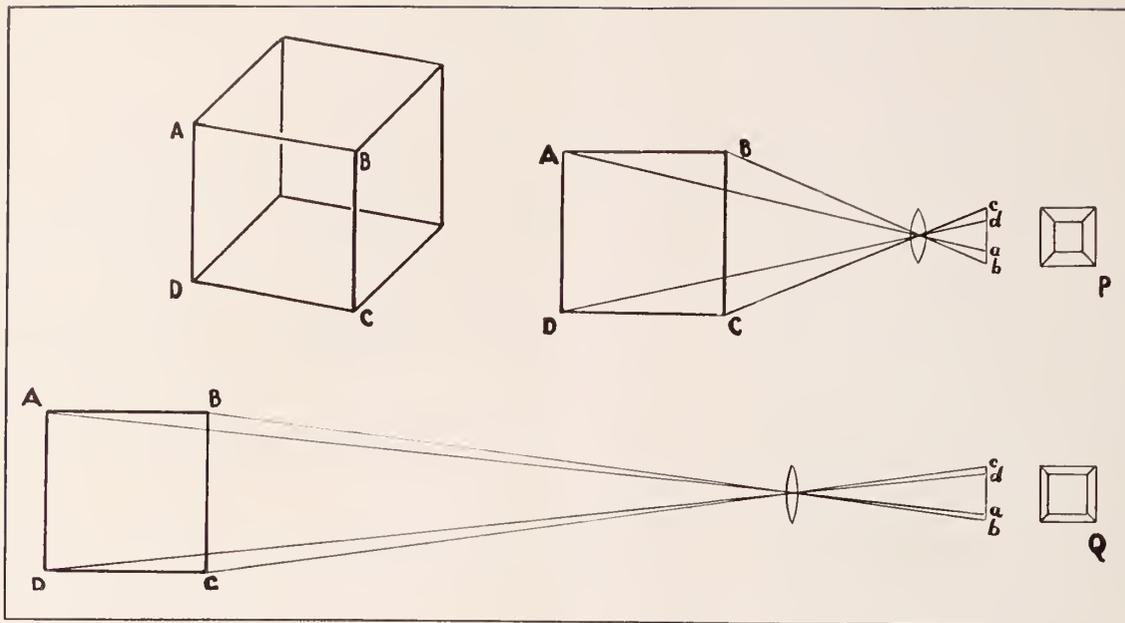


Fig. 1

More Talk About Perspective

by
Harry Walden

IN W. J. Grace's concluding talk about lenses he remarked that any reader who had seen the perspective question discussed in an article would be one up on him. Well, I think I may claim to be two up, for although it is hardly a subject of the "popular" class, I have not only read such articles but written them. Moreover I have offered an explanation for one curious phenomenon which I believe is original. If any reader of the "American Cinematographer" has seen it before I shall be glad if he will let me know.

In addition to being a geometrical question, the appearance of perspective in a picture is also a psychological one.

The drawing which appeared in the February number dealt with one geometrical aspect. But let us consider it in a slightly different way. Again take for illustration the outline of a cube, of which ABCD, Fig. 1, is a side elevation. We photograph this with a lens of, say, one inch focus, with the result that the horizontal lines of the cube will appear at c, d, a, b (upper drawing) and the photograph will appear at P. We repeat the experiment with a lens three times the focal length of the former (say 3"). In order to get a photograph of the same size as before it will be necessary to get three times as far away from the cube and the result will be as at Q (lower drawing). It will be seen that the lines in the photograph representing the farther edges of the cube are now much closer to the lines representing the near edges. This illustrates in graphic form the reason why the distances apart of objects seem to be less when we use a telephoto lens. Two men standing, one behind the other will appear to be close together if a long focus lens (i.e. narrow angle) is used, but will appear to be much farther apart if a normal lens is used. The landscape beyond a foreground of trees will

appear to be further away with a wide angle, than with a narrow angle lens.

But this is not the whole story. Look again at the pictures of the cube (P and Q). If these had been placed before you without explanation, what would you have made of them? One might perhaps imagine both to be pictures of cubes. But P might be a truncated pyramid, while Q might be a flat plate with bevelled edges. Or again they might both be nothing more than a pattern on the paper.

The fact is that when solid objects are projected onto a flat surface the eye and mind cannot gain any idea of solidity or size without the exercise of imagination and the reference to the sizes of known things. If the photographer takes a picture of a tall cliff he places a man beside the cliff for the purpose of comparison. Without this the photograph might just be of another of Hollywood's miniatures.

Consider again the instance of the two men, one standing behind the other. In Fig. 1 imagine BC is the nearer man and AD the farther. Then with a long focus lens we shall get a picture something such as F (Fig. 2) in which the photograph will show the image of the farther man about $\frac{3}{4}$ the size of the nearer. (Compare ad and bc in Fig. 1, lower.) With a shorter focus lens we shall get the image of one man about half the size of the other (as at G, Fig. 2. Compare od and bc, Fig. 1, upper.) Suppose now that with the camera in the same position as G was taken, we use a lens of longer focal length. While the relative sizes of the images of the two men will be in the same ratio as before the sizes of both will be much larger (H, Fig. 2). We could have obtained the same result by enlarging the

picture G. Now I think you will agree that the two men in G appear to be standing farther apart from one another than the two men at H. This is a peculiarity that you can test for yourselves elsewhere, the more distant objects in the enlargement appearing to have come nearer. The small snap is notorious for the way in which it exaggerates the distance. You can also watch the same effect with a given photograph by bringing it closer and closer to an eye. The effect is more noticeable when the picture gets very close to the eye, and in this position a short focus viewing lens will be required to keep the picture in focus in the eye. The nearer you bring it the less appears to be the separation of the planes of the picture.

Why is this? When you see the picture on paper you cannot tell the size of the objects without some object of known size for reference. Here you have a picture of a man (H). You know the size of a man from experience, but you do not know how far away he is in the picture. So the eye jumps the gap and tells you that this man, being a certain size on the retina of the eye, must therefore be so many feet away. The eye regards the nearer man as ten feet away, and, as the farther man appears half the size, he must be twenty feet away; i.e. they were ten feet apart. Now pick up a reduced-size copy of the same picture (G) and regard it from the same distance as the other. The image of the nearer man is, to the eye, of the same size as the distant man in the enlarged picture (H), i.e. 20 feet to the eye. But since, in the smaller picture, the distant man is again half size to the retina, therefore, says the eye, he must be forty feet away. So that this time the men appear to be twenty feet apart. The distance between the two men thus appears to have increased, although both photographs are geometrically correct. The distances given are, of course, for the purpose of explanation and are quite arbitrary.

The explanation given is a variant of the psychological idea of "constant size." When the eye receives images of different size, it does not regard the distant man as being himself of smaller size. The eye assumes that they are of similar size and that one is farther away than the other, the measure of the distance being governed by experience.

In order to see a picture in correct perspective it is therefore necessary that the images on the retina of the eye are all of the same sizes as they would have been if the eye had been placed beside the lens of the camera. This can be done if the picture is viewed at a distance equal to the focal length of the camera lens. If the picture is enlarged, as on the cine screen, the viewing distance becomes the focal length multiplied by the magnification factor of the enlargement.

While this rule is broadly correct it is not the whole story, as will be found from personal observation. The eye and the camera lens do not work in the same ways. I will just mention two points. First, that the size of the image on the retina changes as the focus of the eye changes. Secondly, that, while the camera lens remains still, with an all-embrocing vision, the eye sees only one point at a time clearly. In looking from one point to another the eye has to swivel, and the extent of the eye's movement must have some effect on the judgment of distance. Take rather an extreme example in Fig. 3, in which AB is twice

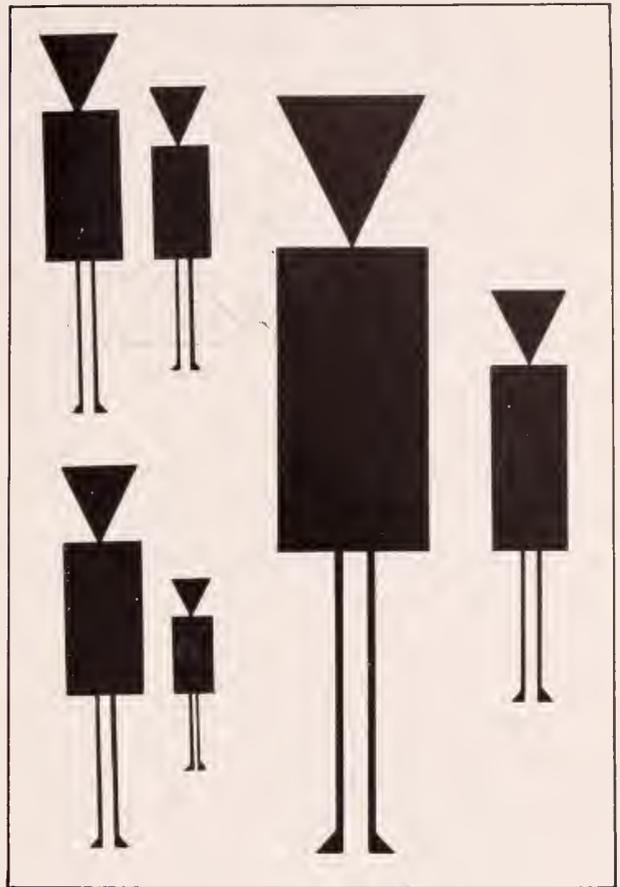


Fig. 2
At top left is Illustration F. At the bottom is Illustration G and at right is Illustration H.

the distance of CD. But the eye does not turn in the arithmetical ratio of 2:1, for the angle AEB is more than half CAD.

This question of apparent perspective has special applications to cinematography, for we are dealing, not with still objects at set distances, but moving objects. If a long focus lens compresses the appearance of distance an object moving forward across that distance will appear to travel more slowly. So that if it is wished to exaggerate the speed of an approaching train it is as important to use a short focus lens as it is to slow the speed of the camera. There is not, however, at present space to elaborate on the practical applications of the subject.

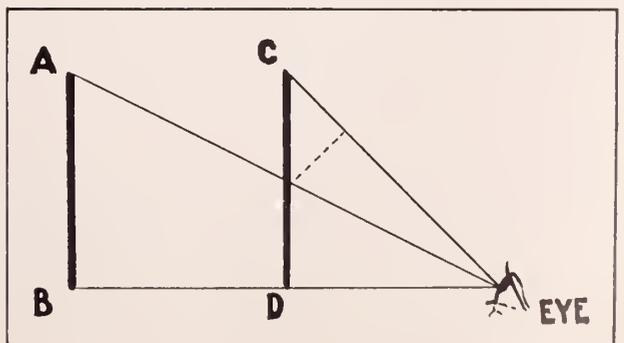
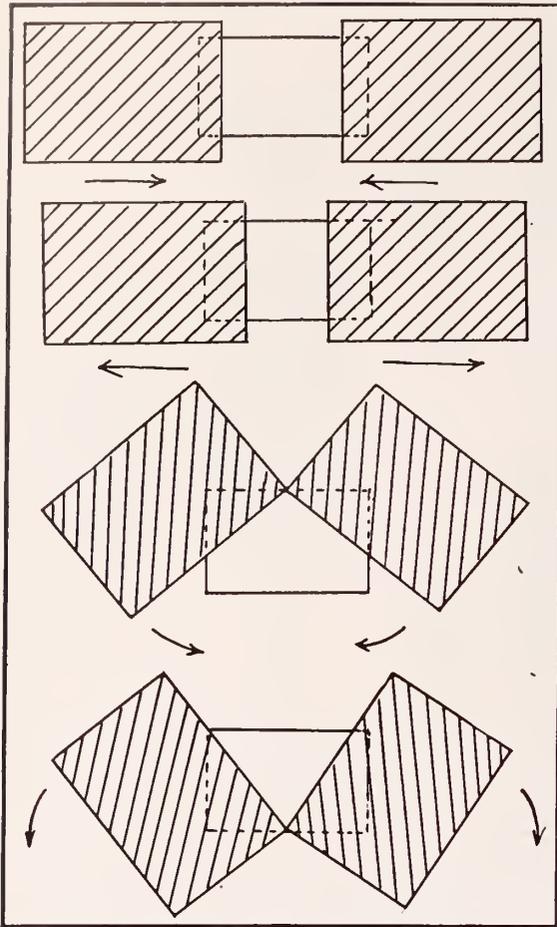


Fig. 3



Bringing cards together as at top wipes scene off. Starting from center as in second from top illustration and pulling cards outward wipes scene on. These effects can be varied as illustrated in the bottom two sketches.

EVER since the beginning of amateur movies it has been the ambition of every movie maker to do tricks like he sees on the professional screen. It has only been the last year or so that the camera manufacturer responded with what they call professional 16mm cameras and there doesn't seem to be anything that their cameras won't do—if we are to believe the advertisements we read about them. The only thing they fail to mention is that you must know all the fundamentals before you can get the results they make claims for. And when you know all of those and how to apply them you are then in the professional class. And—when you get in this class—you can do all of these tricks with most any camera.

Now that I have made such a broad statement let me show what I mean. About the only requirement to be met as far as the camera is concerned is that it should have a crank or some means of backing the film up about two feet. Any 70 Model Bell and Howell can be thus equipped, the E.K. Special and some Victor models meet this requirement. Other cameras can be thus equipped by workers who do special work along this line.

The next thing you need is a matte box. You can buy one for a few dollars or you can make one. A pair of

Tricks

scissors, some black paper and cardboard, a fading glass, and a good imagination and you are ready to go to work. A good imagination is the most important part of your equipment. This will be true no matter what kind of a camera you are using.

Now, for some tricks. Fade in and fade out can easily be made with a simple fading glass. Lap dissolves are also made with this. The one scene is faded out, the film is backed up the length of the fade, and the new scene faded in and you have a lap dissolve. However, I prefer to use a neutral density filter, and make fade outs with the iris in the lens. Fading glasses are all right except they are likely to make a slight jump on the screen when the glass is first put in front of the lens.

Suppose you have a shot you want masked, as through a keyhole, or a telescope. Easy. Cut your mask out of black paper and fasten it on your matte box with Scotch or adhesive tape. Remember that the line of the mask can be made perfectly sharp by getting it a few inches from the lens (of course it must be cut straight). If you want a softer outline bring it closer to the lens. By putting a piece of raw film—without a black backing—in the camera gate you can focus on it and know pretty well just what you are getting. You can thus cut out any kind of a mask you want, including vertical and horizontal masks which are used for making "twins" out of one person, and so on. While we are on that subject it might be just as well to warn you that this is an extremely difficult shot to make so that a line doesn't show. You must depend a great deal in getting the correct background and the correct lighting. When you get all that you can, do it with the most simple paper masks. It is a trick which is seldom used in most amateur productions. When you do use it you must take your time in getting the correct set-up.

Incidentally, it is a slow job to do most any kind of trick work. If you have the imagination and patience you can do most anything. You can't rush and get results. Hollywood spends millions doing trick work, and most of it is spent for time, patience, imagination, and exacting work. Your trick work need not cost you much, but you must expect to learn fundamentals and spend lots of time.

That covers most of the tricks which are claimed for the so-called trick cameras. We have our matte box, so let's see what else we can do. Why not make wipe offs which are so popular. All you need is a piece or two of black cardboard. As you approach the end of the scene draw it in front of the matte box, keeping count of the number of turns the crank makes while the card is going across. Cover the lens and back the film up exactly the

With the Camera— Wipe-offs

by
J. Lloyd Thompson

Laboratory Supervisor, The CALVIN Co.,
Authorized Agfa Ansco Reversal Laboratory

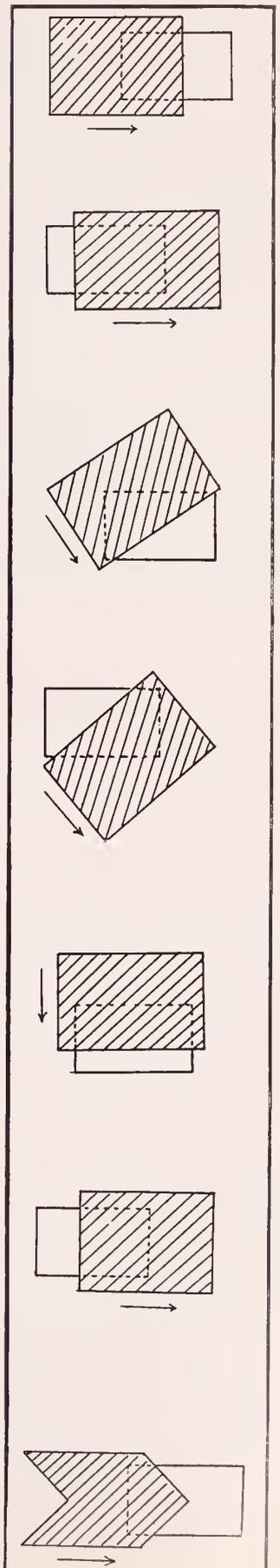
number of turns the crank made while the card was going across. This will take a little practice and the best way is to learn to time it by counting. After the film has been rewound you are ready to start the next scene, starting the scene with the card covering the front of the matte box and drawing in the same direction draw it off the matte box with the same number of turns that the crank made when you wiped the first scene off. If you have timed correctly you will have one scene chasing the other off perfectly. The farther the card board is from the lens the sharper the line and the more accurate the timing needs to be. You can vary your wipe like some of the drawings.

Another good effect is produced by using an Iris Vignetter (can be secured for Bell and Howell Cameras and several others). Make your "fade out" with the vignetter, back up the film, and make the fade in with the vignetter.

If you will watch the professional screen you will probably be able to devise new ones of your own. You can't make all of them because they use an optical printer for theirs, which gives them more of a range but you will be able to duplicate enough of them to make your pictures more interesting. If you feel you must have every trick there is at least one firm in the United States which uses an optical printer to make trick work on 16mm film. This will cost money but it can be had.

Another stunt which you can use. When you come to the end of a scene give the "pan" handle of your tripod a shove while the camera is still moving for 6 or 7 frames. Start the new scene in the usual way. It will look like you have made a quick jump and stopped suddenly and accurately on the new scene.

Don't make the mistake of using too many effects. Try to have a logical reason for the use of every one you use. Don't use the same one too many times. Always be on the lookout for new tricks which you can do, and **use your imagination!**



Simple wipe off as at top. Push card across lens; for wipe on pull card from lens. Next two same effect, but from angle. Five and six from top look complicated on screen. Here's how you do it. Wipe off from top, wind film back, wipe new scene on from side. Bottom sketch is arrow wipe off. Many other designs can be used.



When You Shoot Color Remember---

by
William Stull, A.S.C.

WHEN Dr. C. E. K. Mees, A.S.C., announced the new Kadachrome process, he said: "It is as easy to take 16mm color pictures by the Kadachrome process as it is to take 16mm black-and-white pictures, and the percentage of good results obtained is as high." The sponsors of the Dufaycolor process say, in substance, the same thing. In other words, 16mm color has been perfected to the point where the only unpredictable element is the man who operates the camera. As long as he uses the right exposure, the right lighting, and chooses the right subjects, the process—either one of them—will give him back good color. Only when he abuses the process—goes beyond the limits set by its makers—need he expect a failure.

The first consideration in any photographic work is correct exposure. This is doubly important in natural-color cinematography, for no color-process has ever been devised that had the great latitude of black-and-white. The key

to success in Kadachrome, Dufaycolor, or Kodacolor is accurate exposure.

The best guide to correct exposure is always the use of an accurate, photoelectric exposure-meter. Such a meter is far from being a costly accessory, for though the first cast is a sizeable sum, one need only lose a few badly-exposed rolls of color-film to waste far more than the price of a meter.

The manufacturers of both Kadachrome and Dufaycolor recommend a stop of f:8 in a bright light as the correct basic exposure for their films. Dufaycolor users have already found that if you use a Weston Universal meter, with the film-speed indicator set at 16 degrees Scheiner (No. 5 on the meter), the meter will give you perfect exposure-readings. The same should be true of Kadachrome, as well. Using the smaller Weston Cine meter, which is calibrated to give a direct reading (in f: openings) for regular Panchromatic film and the average 16mm camera, all that is necessary is to use the next larger opening. If, for example, the meter reads f:8, the Kadachrome or Dufaycolorist should get a perfect exposure by opening up to f:6.3.

In following this simple "one stop larger" rule, one thing should be remembered: take one stop more than the exposure for **regular** pan—two stops more than you would use for **Super** pan if that is your accustomed type of film. I am informed that a certain amount of confusion exists on this point, and has caused users of both processes many wholly unnecessary failures.

Certain photographic experts have also suggested that users of the Kadachrome process might do well to consider the chromatic value of their subjects to some extent in view of the three-layer emulsion on this film. Theoretically, at least, they point out, cinematographers who use this process in the West, where reds and browns predominate in landscapes, would do well to allow slightly more than the indicated one-stop increase, in order to make sure that these red components penetrated the red-sensitive (bottom) emulsion with sufficient strength to give a good exposure. This theory has not, however, been verified: but if you live in a predominantly reddish-brown neighborhood, and your Kadachrome rolls seem underexposed, this may possibly be the answer. We would like to hear from anyone who has this experience, and tries the remedy outlined.

Another point of the greatest importance is the correct use of the supplementary filters. The "haze-cutting" filter should always be used in long-shots and at the seashore, in order to eliminate the bluish haze which, while not always visible, is nearly always present, and which otherwise would give your picture an unbalanced, bluish cast. The same is true, also, of the bluish filter intended for use with artificial lighting, which serves to correct the reddish tinge otherwise imparted by Mazda or Photoflood illumination.

The matter of lighting has an equally direct bearing on the success of color pictures. Many of us, I realize, are prone to consider lighting as something involved only when we set up the Photofloods and make interiors: but it is just as evident in normal, out-of-door shots. In black-and-white, however, the latitude of the film covers up discrepancies in lighting along with a multitude of other sins—but not so in color. The best lighting for pleasing results in any color process is a flat light. A few years ago, I made an interesting test with Kodacolor, shooting the same subject with three different lightings: flat light (with the sun behind me), cross-light (the sun at my

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Motion Picture Hall of Fame, San Diego Fair.

Amateur Movie Day at San Diego Fair

HERE is real news for home movie makers who have the yen to get on a motion picture set and actually photograph film players at work!

The Screen Actors Guild and the Dominos Club of Hollywood have made it possible for the 16mm and the 8mm enthusiasts to do just that!

The above organizations are sponsors of the Motion Picture Hall of Fame, which will be one of the biggest attractions this summer at the California Pacific International Exposition which opened at San Diego, California, May 29th, and which is scheduled to run until next November. One of the biggest features to be seen in the Hall of Fame is a motion picture company that works daily on a special sound stage. A special cast of Hollywood players has been signed for the entire run of the exposition. These work under the direction of Richard Tucker. A complete technical crew of cameramen, electricians, prop boys, grips and the like are on hand, just as in a studio. The very latest type Mole-Richardson studio lighting equipment furnishes the light. RCA sound recording apparatus records the sound, and Mitchell cameras are used for the photography.

Walter McGrail, who will be remembered for his work in "The World Moves On," "Demon For Trouble," "The Lemon Drop Kid" and scores of other films; Helen Mann, former Metro - Goldwyn - Mayer contract player; Warren Burke, former Fox featured player; Amron Isle, whose latest screen appearance is in Warner Brothers' "Page Miss Glory"; and Florence Short, stage and screen veteran, comprise the stock company. From time to time some of the biggest stars in Hollywood will appear at the Hall of Fame as "guest stars" in the film making.

And now comes the important news for the home movie makers—**EVERY MONDAY DURING THE ENTIRE RUN OF THE EXPOSITION HOME MOVIE MAKERS WILL BE PERMITTED TO SET UP THEIR CAMERAS BESIDE THE PROFESSIONAL CAMERAMEN AND ACTUALLY PHOTOGRAPH THE PLAYERS IN ACTION.**

Mondays will be known as home movie makers' days. The finest lighting experts of the film colony will do the lighting, and Director Tucker will do the directing—all for

the amateurs! And if one of the biggest stars of Hollywood happens to be guest star that day, the amateurs will be permitted to do their stuff just the same.

There will be a lot of other features in the Hall of Fame to record for home showing. For instance—there is a set that was used by Paramount in "The Crusades." There is another from Universal's thriller, "The Bride of Frankenstein," one from RKO's "She." Another from Walter Wanger's "Shanghai," and one from Grace Moore's latest Columbia film, "Love Me Forever."

The most valuable and all-embracing collection of costumes, props and other appurtenances pertaining to picture making ever assembled will be on display. Remember Mary Pickford's famous curls! Well, they are in the Hall of Fame. There is one of Chaplin's famous burlesque boots that he wore in "The Gold Rush." The first camera used in America to make films is there. Hundreds of costumes worn by stars of both the present and the distant past are on display. In short, this is a real motion picture exhibit. The studios have rallied to the support of the Guild and the Dominos in making this the first real Hollywood motion picture exhibit.

Thousands of visitors to the exposition will want to see how pictures are made while they are in California. But the studios will allow no visitors. Through the Hall of Fame the picture people feel they will delight these people who otherwise would leave California with a feeling of disappointment, for in the Hall of Fame they can see how pictures are made just as well as though they were in a Hollywood studio. And—on Mondays they may step in and make them themselves.

The film building is fitted out like a regular studio. Every bit of equipment used in a studio will be in the Hall of Fame, and is used for the filming of sound pictures. Everything is real. Nothing is tricky. It is a friendly gesture on the part of the film people to bring the public behind the scenes, as it were.

For those amateurs who want to know something about the making of animated cartoons there is an exhibit that is priceless. Walt Disney has an exhibit showing every step in the making of a Mickey Mouse Cartoon. Walter



Fig. 1



Fig. 2 and Fig. 3



NOTHING could have more strongly proved my assertions regarding the pains one must take with straight makeup than the article, "Corrective Makeup as an Aid to Cinematography" by Perc Westmore, a man who makes his living applying grease paint to screen actors. I trust that Westmore holds no grudge against my boldness in talking for the past three months about a subject concerning which I am admittedly quite green, and that he has found as little as possible to question in what's been said.

Fig. 6

Dabbling

Personally, I sincerely look forward to more such articles by men whose daily bread is dependent upon the application of screen makeup. My desire is not based on curiosity as to what Hollywood does so much for the glamour involved as for knowledge of the principles such artists have discovered, and I really think most readers of AMERICAN CINEMATOGRAPHER—the amateurs, at least—feel as I do, for makeup is so much a part of fine cinefilming and so little is known about the subject.

With this, the last of this series of an amateur's trials with screen makeup, we'll tell of some of the things we tried along the line of character makeup—things which we hope will ground the reader in the simpler phases of character work. Perhaps professional studio procedure will sometime be forthcoming, that we may see how well-known screen characters have been made up—Frankenstein and his bride, some of Lon Chaney's characters, Edward G. Robinson's Portuguese study, Paul Muni's Mexican role, and so on.

Character makeup usually conjures thoughts of whisk-



Fig. 7



Fig. 4



Fig. 5

in Makeup

"Character Makeup"

by
Wm. J. Grace

ers, wigs, grey hair, wrinkles, and deep scars. Everybody likes to play with whisker makeup (the males I'm referring to now), and it might be a good idea to consider the preparation and application of crepe hair just now.

Crepe hair is not hair (that's one for Ripley)—it is vegetable fibre probably made by squirting liquid vegetable matter of special concoction thru tiny holes in a steel die. A lot of these fibres are then braided together and dyed, and this is crepe hair as the makeup man gets it. To prepare this stuff for use, about a foot of braid is cut off and unbraided, dampened with water, and stretched overnight. A rubber band on each end to hold the mass to a couple of pegs or the legs of a chair is an easy way to stretch the hair and take some of the curl out of it. When dry, the hair can, with care, be combed out, when it is ready for use.

Crepe hair is stuck onto the skin with a liquid known as "spirit gum"—you'll find it listed in the materials published in the first article of this series. A brush comes with the bottle of gum for convenient application. As the spirit gum dries rather quickly, don't waste too much time applying the crepe hair to the gummed skin area. Neither should the gum be too wet—just at the point of stickiness. It is well, too, to hold the hair pressed to the skin until the gum has dried to a certain extent, a thing which is necessary if the hair is to stick properly.

We applied more hair than was necessary, and after the gum had become dry (it only took about five minutes), the desired shape and fullness of the whiskered area was attained with a pair of scissors. In the four pictures of the "Scotsman" shown with this article, we used brown crepe hair, with a few black strands mixed into it. In Figs. 6 and 7, the character used black hair. The mustache is his own, the little Van Dyke chin growth was crepe hair.

I have purposely included a very poorly madeup character to show the effects of too violent a treatment of wrinkle accentuation. The Scotsman in Fig. 5 was made up with exaggerated forehead wrinkles and No. 23 grease paint on the face—which would have been fair makeup for the stage. Figs. 3 and 4 show the same character with no grease paint at all and no madeup wrinkles. The lights caught the natural wrinkles and rough skin texture, adding to the rough-hewn face of the character depicted. By the way—this shows the effectiveness of grease paint in smoothing out the skin for picture work.

We felt rather proud of the Scotch character, because the first one we made (which is Fig. 5) was so poor. The

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Fig. 8



Fig. 9



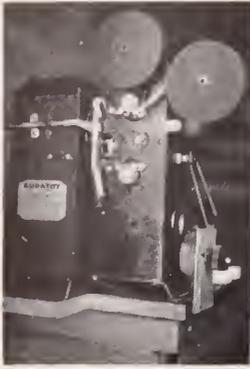


Fig. 1



Fig. 2



Fig. 3



Fig. 4

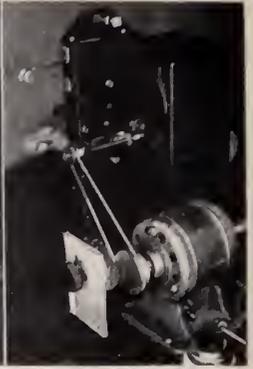


Fig. 5

Building a 16mm Printer

by
Charles E. Keevil

EDITOR'S NOTE: This is one of the entries in the Tricks and Gadgets Contest. Others are pending and will be printed from time to time.

MANY amateur cinematographers would like to develop and print their own motion pictures but there are few 16mm printers on the market and these few are rather high priced. The writer solved this problem in a very satisfactory manner by converting a Kodatoy projector into a printer. The entire cost, including the projector, being less than \$10.00. The photographs show better than words can describe how this was done but a brief description is in order.

Fig. 1 shows the operating side of the printer. Both condenser and projection lenses were removed and a 21 c.p. 6-8 volt auto headlight bulb put in the socket in the lamp house in place of the double filament bulb used for showing pictures. The bulb was wired to the transformer already in the machine thru a radio rheostat so that the printing light could be adjusted to the density of the negative being printed. A framer was built out of a strip of brass, being pivoted on a machine screw in front of the gate and held in adjustment by a machine screw thru a slot near the outer end of the framing lever. The aperture plate already had a slot that fits over a small lug filed on the end of the framing lever as can be seen in Fig. 2, a close-up view of the gate and framer.

The stationary half of the gate was removed from the machine and refastened with machine screws slightly closer to the film claw so as to get positive engagement of the two films, especially at a splice in the negative. While it was off, two small strips of sheet brass were soldered across

the depressed center portion of the gate above and below the aperture so as to completely surround the aperture. This, in combination with the aperture plate about to be described, was necessary to secure good contact between the negative and the positive as the gate when used as a projector only held the film at the edges.

The aperture plate or movable half of the gate was completely changed as shown in Fig. 3, the aperture being filed out and a new aperture made of spring bronze, fastened to the back of the main plate on one end only so that it would bear on the film with only the light tension needed to maintain good contact between the two films. The aperture plate spring continues to supply the main tension on the edges of the film as it did in the projector, the spring bronze aperture tension being so light that any particle of dust on the negative will lift it and not cut into the film and cause a bad negative scratch. Needless to say, all parts of the gate coming in contact with the film received a finish polish with crocus cloth. The nozzle seen in Figs. 1 and 2 is connected to a blower which keeps dust from accumulating in the aperture and spoiling the print.

Fig. 4 shows the opposite side of the printer with the motor drive, blower, lamp rheostat and control switches as well as the positive film spool spindle. Fig. 5 is a closer view, showing in more detail the worm gear drive for reducing the motor speed. This 30 to 1 reduction allows the universal motor to run practically at its "no load" speed and therefore its speed is quite constant. This also gives a printer speed of about 8 frames a second which is slow enough that the operator can change the printing light with the scene changes by watching the picture in the printer aperture.

One of the switches controls the printing light and the blower, the other switch controls the printer drive motor. Since the particular blower used by the writer had a 60 volt motor, it was necessary to run it thru the two resistance tubes for 110 volt operation. This blower came off an old Victor disc sound projector but a hair dryer with the heating coils removed would do as well or better.

The take-up reel spindle of the Kodatoy was mounted on the upper front of the machine with a strip of metal to carry the spool of positive stock, the regular feed reel spindle serving to hold the spool of negative. No take-up is used on the printer, the base of the projector as well as the board on which it is mounted being cut away to allow both films to run into a large corrugated paper box from which they are re-wound onto spools.

With a printer like this and a small drum and troughs for development, an amateur is equipped to turn out just as nice work as he can get from the commercial laboratory. Of course, he will have to do some experimenting to attain this but that only adds to the pleasure of a real amateur.

One look makes you a KODACHROME



Never before FULL-COLOR MOVIES like this!

IT'S big news. Startling news! Wherever home movie fans gather you'll hear it "—Have you seen Kodachrome? It's black-and-white come to life."

Even the simple written facts about this revolutionary new Eastman color process seem unbelievable. Gone are the now old-fashioned compromises. Load Ciné-Kodak K, Ciné-Kodak Special—or any 16 mm. camera of 100-foot film capacity—with Kodachrome. Expose it, practically as you expose black-and-white. Show it in colors such as have never been screened before.

That's the essence of the whole Kodachrome story—you've got to see Kodachrome movies before their full possibilities are apparent. And as you enjoy them, remember that you can make them with your 16 mm. camera if it loads with 100-foot film rolls, show them with your 16 mm. projector.

Where can you see Kodachrome? At your Ciné-Kodak dealer's. Just one look makes you a Kodachrome fan.

MAKE KODACHROME MOVIES

- ...with any 100-foot load 16 mm. camera.
- ...with any lens, including wide angle and telephoto.
- ...without a filter for all ordinary shots.*
- ...by simply using one diaphragm stop larger outdoors than that required for regular "Pan" Film.

*Inexpensive filters are recommended for gray-day filming, distance shots, and indoors with Photofoods. Ask your dealer for instruction folder.

SHOW KODACHROME MOVIES

- ...with any 16 mm. projector—your projector.
- ...without a filter—the color is in the film.
- ...without showing pattern, lines or fringes on the screen—just smooth, even color.

...with the full size and brilliancy of black-and-white.

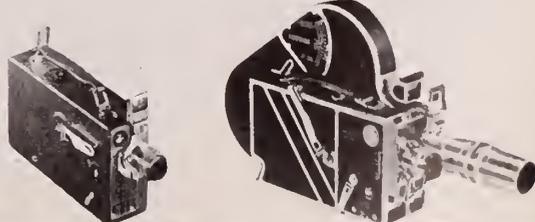
IMPORTANT

At present Kodachrome is being processed as rapidly as possible at Rochester, N. Y., only. As soon as practicable other processing stations will be equipped to handle Kodachrome. Supplied at present only in 100-foot lengths, its price, including processing, is \$9. Eastman Kodak Company, Rochester, N. Y.

These Two Ciné-Kodaks Make Kodachrome at Its Best

At its former price of \$152.50 Ciné-Kodak K f.1.9 (left, below) was the most widely used 16 mm. camera. Now you can buy it for only \$112.50—\$125 with case.

Ciné-Kodak Special is the most versatile of all 16 mm. cameras. No adequate description of it can be given here. See the "Special" at your dealer's or write for the free booklet, "Presenting Ciné-Kodak Special."



Only Eastman makes the Kodak



Continuity for Two People

by
W. Bernard Roberts

A YOUNG couple can produce this with no outside help. The husband can double for himself and the tramp, and in the scenes in which both he and his wife appear the camera can be locked. In case it is desired to star the cat, the script can be revised so that only the hands and feet of the human actors appear.

A Cat-astrophe

CAST

- The Bride
- The Husband
- The Tramp
- The Cat
- The Canary

Scene 1. Closeup. Cake being iced. Truck or cut to
 Scene 2. Closeup. Bride icing cake. Bird cage above to R. She talks to bird as she works.
 Scene 3. Med. shot. She finishes cake and places it on table, then goes to bird cage.

Scene 4. Closeup. Feeding canary. Cage door is open.
 Scene 5. Closeup. Cat on floor looking up.
 Scene 6. Semi-closeup. Continuation of Scene 4. Bride sees cat.
 Scene 7. Med. shot. Same as Scene 6. She puts cat out of door.
 Scene 8. Closeup. Telephone.
 Scene 9. Bride feeding canary as in Scene 6. She hears 'phone and exits.
 Scene 10. Closeup. Bride at telephone. She settles herself for a lengthy conversation.
 Scene 11. Closeup. Bird in cage; door open.
 Scene 12. Closeup. Inside of open window. Cat comes over ledge, sits on ledge a few seconds, then jumps down into room.
 Scene 13. Closeup. Back to Scene 10; Bride finishes conversation, hangs up, sits thoughtfully for a few seconds then remembers bird, and exits.
 Scene 14. Long shot. Same room as Scene 3. Bride comes from behind camera and goes toward cage. About half-way to cage she stops in dismay.
 Scene 15. Closeup. Empty cage.
 Scene 16. Med. closeup. Reverse of Scene 14, with part of cage in foreground. She starts to look around, and ends by looking down.
 Scene 17. Closeup. Cat washing.
 Scene 18. Med. shot from same angle as Scene 16. Bride picks cat up by back of neck.
 Scene 19. Closeup. Same. She is furious — talking and shaking finger at cat.
 Scene 20. Long shot. She carries cat out. Quick fade.
 Scene 21. Med. shot. Car in drive in foreground. Bride gets into car with sack which evidently contains cat. She starts car and drives out of picture.
 Scene 22. Long shot. Country road. Bride approaches in car, comes to a stop near camera, and gets out with sack.
 Scene 23. Med. shot. Part of car in foreground. Bride goes thru farm gate and down path.
 Scene 24. Closeup. Camp fire with coffee can and hot dogs on stick. Truck or cut to——
 Scene 25. Med. shot. Same showing tramp by stream under bridge. He has a newspaper or detective magazine propped up, and he reads as he cooks.
 Scene 26. Closeup. "Murder" headline or title of story.
 Scene 27. Long shot. Bride as she walks resolutely to bridge and up to rail.
 Scene 28. Semi-closeup. From below as she looks over.
 Scene 29. Semi-closeup. Tramp reading; he gets excited about the "murder" story.
 Scene 30. Semi-closeup. Back to Scene 28. She shuts her eyes and drops sack. (Note: Don't drown the cat, we'll need him later!)
 Scene 31. Closeup. Sack hitting water and sinking.
 Scene 32. Closeup. Tramp, as he sees and hears splash. His eyes bulge. He speaks:
TITLE: "A Moider!"
 Scene 33. Closeup. Same as Scene 31. Circles widening in water.



WITH THE AMATEUR CLUBS

Club Bulletins

● Two very interesting bulletins reach us, one from the Metropolitan Motion Picture Club of New York and the other from the Chicago Cinema Club. They are interesting, meaty and undoubtedly are eagerly read by their membership. Annette C. Decker is editor of the Manhattan club paper called "The Closeup" and S. F. Warner edits "News Flashes," the Chicago Cinema Club paper. Both of these people deserve a lot of credit for the great amount of work they do in getting out these papers. But more about these clubs anon.

Clubs Show Prize Pictures

● Many clubs are arranging to show the American Cinematographer 1934 Prize Winning Amateur Pictures. This year "New Horizon," the first prize winner, and "Tender Friendship," the winner for photography, which is expected from the laboratory very soon. In addition, last year's 8mm winner, "Cattle Country," is also available to clubs.

The 16mm subjects duped for club showing from the 1934 prize winners include only two subjects, "Water," made by M. Demarest of Hackensack, N. J., and "Mischief," made by Van Dee Sickler of Hollywood. The latter won in the Home Movie Class, while the former took the prize for Educational pictures.

Some clubs are splitting the pictures into two showings: one for the 8mm pictures, and the other showing for the 16mm pictures. However, many wish to put them over in one meeting and also save the double shipping expense. The films are available to any club in the country. It is merely necessary that the club pay all transportation expenses.

Gives Prize Money to Charity

● From newspaper clippings sent us from Sydney, Australia, we glean the fact that J. Sherlock who won the \$50.-00 prize for Scenics with his picture, "The Brook," gave this money to an unfortunate little child who had its leg bitten off by a shark.

It seems the little tot was in bathing with its pals, but remained in the water a little longer than the other children.

When it started floundering and yelling the first thought of those on shore was it was merely playing. Too late it was realized that a shark had attacked the youngster. Adults immediately went to the rescue. Naturally the case elicited a great deal of sympathy from everyone because of the age of the youngster and because the parents were not too well fixed with this world's goods.

Sherlock's gesture deserves not only the praise of his townsmen but the praise of every cinematographer.

Los Angeles Club Contests

● This year as in past years the Los Angeles Cine Club is devoting every other meeting to contests. These contests have proved very popular with this club. They have been divided into classifications so that the beginner does not have to compete with the advanced amateur. Also those winning prizes in one contest cannot compete again that year.

Metropolitan Club

● The subjects taken up by the club is always interesting to another club, it helps the program committee arrange more interesting meetings. Undoubtedly a recent meeting held by the Metropolitan club will serve as a suggestion for other clubs.

One part of the program was given over to the discussion of titles by one of its members. The making of titles with positive film and reversal. Charles Coles was the spokesman on this subject. His picture was one which was given a medal in 1933 by this publication and last year he was also among the more conspicuous entrants.

Another subject discussed by George A. Ward was the Plot Film. He divided these into three classes: the one made from a prepared scenario, the film which is based on a flexible scenario, and the reel which is made by assembling odd shots and adding a theme, which welds the individual pictures into a unit.

Los Angeles 8mm Club Studies Lighting

● At the last meeting of the 8mm club of Los Angeles considerable time was given over to the study of indoor light-

Continued on Page 274

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WHEELS OF INDUSTRY

Bell & Howell 8mm Camera

• The Bell & Howell Company has announced that it will have an 8mm motion picture camera in production within a few weeks. Samples are now being distributed among dealers. More than three years of engineering development, Bell & Howell report, have preceded this announcement.

The new camera is known as the Filma Straight Eight. It uses a new film, Bell & Howell Filmaaan, a fine-grain reversible anachromatic film which is pre-salinated and packed for daylight loading in cans containing 30 feet of usable film plus 2 feet for loading and unloading. This film costs only \$1.45 per spool, and so provides an attractively low operating cost for the new camera.

Small size, light weight, provisions for extremely simple loading and operation, and the scientific design and Bell & Howell precision construction which make for fine picture results and a long life of dependable service are other advantages emphasized in the manufacturer's announcement of the new 8mm camera. The weight is only 24 ounces; the size is 1 3/8 by 3 by 5 inches.

The camera is easily and quickly loaded. There are no sprockets to thread, no film loops to form. The film spools are placed on the spindles—they cannot be placed there other than correctly—and the camera is loaded! When the permanently-attached hinged door of the camera is opened, the film gate springs open, ready to receive the film. The gate is closed by the shutting of the door. The footage dial is automatically reset to 0 when 30 feet of film have been exposed, and, as it is inoperative when the camera door is open, need never be reset by hand.

A 1 1/2-inch F 2.5 anastigmat lens in universal focus mount is standard equipment. Extra lenses to be available later include: 1-inch F 2.7, 1 1/2-inch F 4.5, and the same three focal lengths in larger apertures. Filma 70 and 75 Camera lenses will later be adaptable to the 8mm camera.

Lens interchangeability is made quick and easy by a spring lock. One merely presses two knobs together to release or replace the lens.

There are four speeds—8, 16, 24, and 32 frames per second.

Winding is easy and silent by means of a permanently-attached, non-rotating key that folds flat against the side of the camera. The spring motor is automatically stopped well before exhaustion of its power, to prevent loss of speed at the end of the run. There is also means to prevent the end of the film from leaving the gate after the film is all exposed. This insures the film's remaining tightly wound on the spool, so that it will not be fogged when the camera door is opened for unloading.

The Filma 8mm Camera is finished in rich brown crinkle-baked enamel with black and plated fittings. It has a sturdy die-cast aluminum-alloy housing.

Film upon film for this new 8mm camera is processed, without additional charge, in New York, Chicago, Kansas City, and Los Angeles, and in stations in most countries outside the United States.

16mm Printer

• A 16mm printer of the continuous design for both picture and sound printing has been designed by Armond Fried of Hollywood. This printer has an automatic light change and other features necessary for a professional printer.

It is motor driven and can be used merely for sound if desired or only for pictures, or for both.



Eastman Reduces Price

• The list price of the Cine-Kodak, Model K, formerly selling at \$152.50, has been reduced to \$112.50 without a carrying case and \$125.00 with the case. This \$27.50 price reduction, according to advice from the Eastman Kodak Company, has been made possible as the result of increased sales, with its attendant manufacturing economies.

Model K, with the f.3.5 lens will no longer be supplied, as the new price of the f.1.9 is practically the same as the f.3.5 model.

Sound Booklet

• Berndt-Maurer Corp. has prepared an interesting outline of "Sixteen Millimeter Sound and Film Recording." This folder is available to all who might be interested by merely writing to the corporation in New York City.

There is considerable basic information contained in this work that would undoubtedly prove of interest to the Technical amateur. Many simple and graphic sketches are employed to explain the text and to show more clearly the method and process of reproducing and creating sound.

Change of Name

• Photographic Specialties Inc. is the new name for Phatalites, Inc., of New York City, a company which has, in the last year, established a reputation in the field of lighting equipment. They are the manufacturers of the Photo-Flood Spot, a unique illuminating device which may be focused to any desired radius or intensity. The "Spot" feature of this device may be used interchangeably with a focusing Reflector.

The decision to assume this name was motivated by plans which contemplate the manufacture of additional photographic specialties of a type that the name Phatalites would not suggest.

New Distance Meter

• Bee Bee Distance Meters, a new American-made unit, has just been placed upon the market by Burleigh Brooks.

Bee Bee Distance Meters are compact, 3 3/4" long and 1 3/16" square. They have a highly polished heavy nickel finish plating over brass. A screw that fits all standard tripod mounts is built in.

KIN-O-REEL
16mm. 400 ft., 1200 ft. and 1600 ft. solid aluminum reels.

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1600 ft. reel metal humidors.
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A continuous printer—Perfect Contact—steady, Semi-Automatic light change—motor driven.

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No. 1, Green Box, 100 ft.....\$3.00
50 ft. 2.00
No. 2, Red Box, 100 ft..... 3.50
50 ft. 2.50

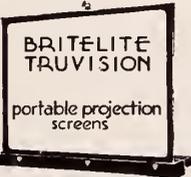
Prices include Processing, Scratch-Proofing and return postage.

KIN-O-LUX, Inc.
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The PERFECT SCREEN
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BRITELITE-TRUVISION SCREENS
Universally recognized as the ultimate word in projection performance for the movie maker's "black-and-white" work, Britelite - Truvison screens are equally adapted for the more difficult requirements of color. These screens will project his Kodachrome shots with undeviating accuracy in color registration—for in these scientifically constructed screens the beads are minute and closely placed—so that color distortion can be totally avoided. A wide variety of styles include "Rigid Frame," Easel, Roller, Metal Tube and De Luxe "A" automatically closing and opening model.

At all Dealers—Literature on Request

MOTION PICTURE SCREEN & ACCESSORIES CO.
51 West 24th Street, New York
Manufacturers of Screens, Reflectors, Projector and Film Storage Cases.

The Distance Meter may be attached directly to the camera by means of an adapter clip, sold for 25c.

It is said these meters have a simple interior construction so that there is little wear, even from hard and steady usage. The eye cup is large, and affords a full, clear image for aligning. The focusing dial is a well spaced, clockwise moving knob, set on the top of the meter with graduations far apart, to insure accuracy. It is claimed the meter is so critical that readings plus or minus 1" are obtained after very little practice.

Feature Releases

● H. B. Kay of Braaklyn, N. Y., announces a new series of sub-standard sound-on-film subjects for rent and sale. Among the latest releases are included "Defenders of the Law" and "Sea Devils."

Reduced Prices

● Fatashap, Inc., has reduced the price of their regular semi-ortho film to \$2.19 per 100 feet; their super speed panchromatic film will continue to retail at \$3.75 per 100 feet.

Fatashap operates its own laboratory—pack and process all their own film. Their laboratory specializes in duplicating of films.

Continuity for Two People

Continued from Page 268

Scene 34. Long shot. Same as Scene 23. Bride running thru gate and toward car. She gets in and drives away.

Scene 35. Med. shot. Tramp fishing for sack with long stick. He finally gets it. Fade out as he pulls it from water.

Scene 36. Med. shot. Fade in, interior of hallway. Husband comes in, takes off hat and coat, and calls as he hangs them up.

Scene 37. Med. shot. Husband coming into same room as Scene 14. Looks around; something unusual attracts his attention.

Scene 38. Long shot, exterior. Reverse of Scene 21. Bride drives in, gets out of car. Cut as she enters house.

Scene 39. Med. shot. Same as Scene 37. Bride comes in door lacking very despondent. Leaves door open. Sees husband, pauses as he comes toward her.

Scene 40. Closeup. Same. He takes her in his arms. She sabs:

TITLE: "—and then I drewed him!"

Scene 41. Closeup. Reverse of Scene 40, facing husband. He looks amused and laughs. She looks up. He nads toward—

Scene 42. Closeup. Canary sitting on fresh cake eating. Pan down to show wet cat on a floor washing himself. Iris out.
The End

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THE HIGHEST QUALITY
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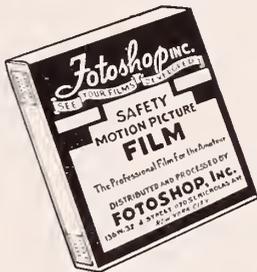


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Hi-Speed PAN for indoor use **\$3.75**
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Write for complete price list of films, services, equipment.

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The reputation of Andre Debrie for the finest in precision workmanship is fully upheld in the new line of DEBRIE 16-mm printers and developing machines. DEBRIE can supply any type of machine to fit any condition of film printing, developing or reversal.

The New DEBRIE Items:

The ultimate in contact and optical printing machinery for SOUND or SILENT. Perfect registration always.

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For optical reduction of picture from 35mm to 16mm. Two 16mm prints on 32mm raw stock can be obtained from one 35mm negative in one operation.

Combined Reduction and Contact Printer

For the following operations:

- 1 For picture REDUCTION from 35mm to 16mm. Two 16mm prints on 32mm raw stock can be obtained from 35mm negative in one operation.
- 2 For CONTACT PRINTING of 16mm film on 16mm or 32mm raw stock.

Combined Reduction Printer for Picture and Contact Printer for Sound in One Operation

For the optical REDUCTION of the picture and CONTACT SOUND printing in one operation.

REDUCTION PRINTER FOR SOUND TRACK

For the optical reduction of the sound track from 35mm to 16mm with pre-set rheostat.

Contact Printer for Picture and Sound

For CONTACT PRINTING of PICTURE and SOUND on 16mm in one operation. This machine also can be used for contact printing of 32mm raw stock.

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Full automatic operation throughout. Reversal Machine incorporates flashing light for second exposure. An outstanding feature is the unusual compactness. (The smallest machine is 7x6x3 feet in dimensions.) Thermostatic control of solution and of drying air is provided. Film threads itself through the washing and drying units and is automatically rewound. Solution tanks removable and interchangeable. Absolute cleanliness is the result—no further treatment of film needed.

PERFORATING AND SLITTING MACHINES

These are made for every requirement, in any width of film.

ANDRE DEBRIE, Inc.

115 West 45 St., New York, N. Y.

WHEN YOU SHOOT COLOR--REMEMBER

Continued from Page 262

side), and back-light (the sun behind my subject, and a good sunshade on my lens). The flatly lit shot was by far the most pleasing: the definition was better, and the coloring more pronounced. Both Kodachrome and Dufaycolor are ruled by the same law: flat, even lighting is infinitely preferable for color-filming.

Back-lighting, however, is at times very effective in closeups, and the increased speed of the new processes makes such lightings easier to shoot. For instance, a close shot of a pretty girl, made under the shadow of a tree, with a few rays of sunshine striking her hair from above and behind, makes an excellent color-shot. In that case, of course, the correct exposure would be whatever was correct for the shaded area; the few back-lit highlights could take care of themselves.

Similarly, color-filmers will be wise to do their shooting in the middle of the morning and the middle of the afternoon, avoiding the straight, harsh top-light of mid-day, which yields unattractive, foreshortened shadows.

The speed of both of the new processes makes it technically possible to film correctly-exposed color scenes even on cloudy days: but there is a considerable difference between the technical possibility of an adequate exposure and the realization of a desirable color-shot. On grey days, the color is still there, but it is noticeably greyed out by the greyed light. Your color scene will reproduce this condition perfectly: but if you want real color pictures, you should shoot your scenes when the sunlight strengthens the colors, not when the clouds wash them out.

The third important factor in making good color pictures is choosing subjects that lend themselves well to color. In general, if visual inspection of the scene shows that color is a really important factor, shoot it in color; if not, black-and-white is just as good—and a lot cheaper. In general, you will get the most pleasing color scenes in the closer shots, though Kodachrome performs very acceptably in long-shots where, as in Zion Canyon, the Grand Canyon, etc., spectacular coloration is half the story. Dufaycolor, so its users tell me, is definitely at its best in close shots, for in longer shots the underlying color-screen (resseau) and the finer details of the picture come into some conflict.

A number of interesting tricks are possible with these new processes: for example, using the Kodachrome artificial-light filter, which is bluish, for an occasional exterior closeup should give a very interesting suggestion of moonlight, while firelight scenes could easily be made indoors by omitting the same

filter, and placing a photoflood unit in the fireplace.

Clearly, 1935 is going to go down in cine history as the Color Year.

DABBLING IN MAKEUP

Continued from Page 265

beetling brows (more crepe hair), the unkempt fuzziness of the side-burns and chin whiskers, the ruggedness of the skin of the face all seem to transform the actor entirely into his role. The Van Dyke of Figs. 6 and 7 was the only thing needed to change his appearance, so, while we thought the result fairly good, the ease with which the effect was achieved perhaps detracted from our appreciation—it was too easy.

One of the girls (Figs. 8 and 9) decided she would determine the effect of grease paint several shades darker than her normal shade, and used No. 28, with the results giving the impression of an unkempt hag. The darkened skin idea was perhaps brought to mind after seeing Paul Muni in "Bordertown," in which he had the swart olive complexion of a Mexican. At any rate, it will give you an idea of the possibilities of makeup as regards skin tones of a race of dark-skinned people.

The different character types which you can create are almost limitless. The little tricks of makeup which change the appearance of a person into entirely different character are manifold. Lighting has a lot to do with the creation of moods, not only of the general scene, but of the actors themselves. And when the many combinations of lighting are utilized with the still more numerous tricks of makeup, the result can be practically anything you want. However, only thru actual experience will you learn the best working combinations, and since the pleasure of experimenting with screen makeup is so engrossing, the task of teaching one's self at least the rudiments of the art cannot be even regarded as a task. So, go to it, and some of these days, out of the ranks of today's amateurs, may rise makeup artists even superior in artistry to the grease paint wielders of today. Here's luck and lots of fun!

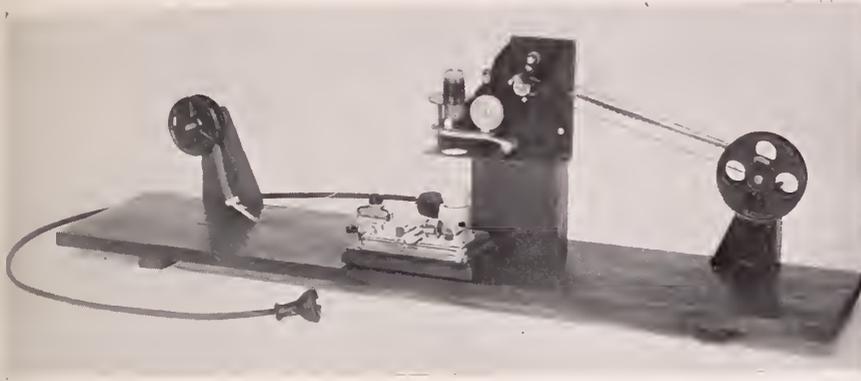
◆ ◆ ◆

And now, as Ben Bernie would put it, "It's time to call a halt," and at the peril of reminiscence becoming reminiscence, may I recall the many helpful letters readers have written me in the past sixteen months I've been writing for the Amateur section of AMERICAN CINEMATOGRAPHER. Thanks a lot—you've been of great aid in suggesting

subject matter upon which to write, and an inspiration to keep at it.

I've enjoyed tremendously trying to talk about cine matters in the layman's language, and if the articles have been of even the slightest inspiration for better cinephotography, I feel repaid many

times over. Other work is becoming pressing, however, and it will be necessary, for some time at least, to step out of the picture for some months. The best of luck and may your amateur efforts some day overshadow even professional perfection!



Tripod base as described on this page, showing how the bases are held in relation to each other with a stout cord.

AN INTERMITTENT FILM VIEWER

THE device may be made by cutting off the reel holders and lamp house from a toy projector and mounting it with the optical axis placed vertically over a small lamp. The reel holders are placed at the ends of the board, the take-up reel being connected to the hand crank shaft by a long spring belt. The film thus passes horizontally from the supply reel thru the gate where it may be inspected by looking down thru the projector lens. After passing thru the gate, the film goes over a hold-back sprocket and on to the take-up reel in the usual manner.

Obviously, the better the design of the projector used, the smoother the operation of the viewer. The Keystone Model E-42, which has both feed and hold-back sprockets would be most satisfactory but the cost (\$10.50) is more than twice that of the Model E-28 (\$3.50) shown in the photograph. This latter model is satisfactory with small supply reels. The take-up may, of course,

be a 400-foot reel if desired. Short lengths of film, with which the viewer is most used, present no problem since they can be run out of a bag and onto the take-up reel.

Any difficulty in keeping the film on the hold-back sprocket may be surmounted by running a length of adhesive tape (sticky side down, of course) under the sprocket from one guide pin to the other. This tape may be covered with velvet if desired, but will cause no damage to the film in any case since the emulsion-side of the film is toward the sprocket. That is, the film runs thru the gate, emulsion away from the lens thus making titles readable.

There is also ample room on the board shown for mounting two of the usual rewinds (not shown in the photograph) which would be used whenever it is not desired to view the film and for reversing the winding of the reels after inspection, that is, from "emulsion in" to "emulsion out."

Amateur Movie Day at San Diego Fair

Continued from Page 263

Lantz has another similar exhibit. On display are the gadgets used to create the sound effects for the cartoons. Experienced men are on hand to answer all questions and explain the workings of everything.

Members of Amateur Movie Clubs who have long been puzzled in the matter of proper use of makeup will find a special exhibit by Max Factor in the building. Specially trained experts from this most famous makeup studio in the world are on hand to advise and demonstrate. They even make up a visitor

who might want to see how she will look with a certain type of make-up. Mox Factor is the man who developed the make-up used by the stars. The benefit of his years of experience making up the Pickfords, Harlows, Garbos and other famous stars is given free to the amateur movie clubs.

It would take a book to tell about everything in the building, so we have just touched the highlights. In closing, here's some advice—don't forget to take your movie camera along when you go to the exposition.

16MM SOUND-ON-FILM PROJECTORS

Here **SOUND PROJECTION** is fully understood and **SOUND ADVICE** is yours for the asking. Your old apparatus taken in exchange at best appraisals.

AMPRO SOUND includes the new RCA amplifier, 15 watt, inertia balancer, 750 watt, powerful, clear, complete at **\$650.00**
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CAMERA COMPANY
 179 W. Madison St., Chicago

Camera Headquarters for Tourists

WITH THE AMATEUR CLUBS

Continued from Page 269

ing. A number of units furnished by Eastman store were used for the demonstration and the setting of the lights was under the supervision of Mr. Sherlock of the Los Angeles Eastman Kodak store. Kodachrome was also demonstrated.

Chica Club Meets Weekly

● The Chicoga Cinema Club seems to be an ambitious and enthusiastic crowd. From the announcement recently received from them it would appear that they have weekly meetings. How they can arrange sufficient programs for that many meetings will be the wonder and envy of many other clubs throughout the country. Here's what's going to happen in June: June 6th, business meeting; June 13th, Victor Animotograph Night; June 20, Kodochrome Night; June 27, Double Feature Program; gadgets and American Cinematographer Prize pictures.

Photography of the Month

Continued from Page 244

"PUBLIC HERO NO. 1" (Metro)

Gregg Toland, A.S.C.: Directing Cinematographer

Hollywood Reporter (May 13, 1935): "The photography on the whole, Okay."

Daily Variety (May 13, 1935): "Camera job by Gregg Toland is excellent."

"CHINATOWN SQUAD" (Universal)

Charles Robinson, A.S.C.: Directing Cinematographer

Hollywood Reporter (May 13, 1935): "Robinson's camera work is uniformly on asset."

Daily Variety (May 13, 1935): "Photography of George Robinson is excellent."

"THE HEALER" (Monogram)

Harry Neumann, A.S.C.: Directing Cinematographer

Hollywood Reporter (May 15, 1935): "Photography by Harry Neumann very good."

Daily Variety (May 15, 1935): "Photography of Harry Neumann adds to the picture's quality."

"THE GLASS KEY" (Paramount)

Henry Sharp, A.S.C.: Directing Cinematographer

Hollywood Reporter (May 15, 1935): "Add to that the fact that Henry Sharp's photography tells a story in itself."

Daily Variety (May 15, 1935): "Henry Sharp has ably done his share with the camera."

CLASSIFIED ADVERTISING

Rates: Seven cents a word. Minimum charge, one dollar per insertion.

FOR SALE—MISCELLANEOUS

35mm NEGATIVE fresh Eastman and Dupont stock — panchromatic — supersensitive — grayback, \$2.50 per hundred feet. 100 ft., daylight loading rolls, \$2.75 each. Leica rolls 36 exposures. 10% discount on all orders accompanied by this coupon. PACIFIC COAST RAW FILM CO., 1558 No. Vine St., Hollywood, California.

BELL & Howell No. 999 silenced unit 1 shuttle prism focus through film, 40, 50, 75mm Cooke F.2.5 lenses mounted. Two 1000-foot magazines, tripod, finder and sunshade. Original factory job like new. Motion Picture Camera Supply, Inc., 723 Seventh Avenue, New York City; Cable—Cinecamera.

230-Degree shutter Akeley Camera X134, special focus on film attachment. 2-, 4-, 6-, and 12-inch lenses. Four 200-foot magazines, Akeley tripod, cases. Motion Picture Camera Supply, Inc., 723 Seventh Avenue, New York City; Cable—Cinecamera.

NEW type Super Parvo DeBrie ultra silent with built-in motor automatic dissolve, pilot pins, anti-buckling device. Four 1000-foot magazines, DeBrie friction tripod, finder, all accessories. Latest type equipment like new. Motion Picture Camera Supply, Inc., 723 Seventh Avenue, New York City; Cable—Cinecamera.

EDUCATIONAL Camera Blimp and Dolly for Mitchell Camera. Follow Focus Device, geared free head, three wheels, pneumatic tires, cost \$1250, special \$500. Hollywood Camera Exchange, 1600 Cahuenga Blvd., Hollywood, Calif. Cable HOCAMEX.

GENUINE Bell & Howell, 1000-ft. magazines in excellent condition, \$50.00 each. Four hundred foot magazines, \$25.00 each. Four hundred foot Mitchell magazines, \$25.00 each. Cases for above, \$10.00 each. Hollywood Camera Exchange, 1600 Cahuenga Blvd., Hollywood, Calif. Cable HOCAMEX.

ARTREEVES latest 1935 portable double sound recording unit with double sprocket recorder, automatic speed control motor, twin fidelity optical unit. Latest type camera motor. New type microphone. Complete factory guaranteed, \$2,400. This is the only authentic ArtReeves equipment for sale in Hollywood outside factory. Camera Supply Co., Ltd., 1515 Cahuenga Blvd., Hollywood, Calif.

BELL & Howell and Eyemo Cameras, lenses, magazines, tripods, moviolas, splicers, rewinds, measuring and synchronizing machines. All kinds sound and laboratory equipment. Process, optical reduction and step printers. Eastman & Dupont spliced negatives tested and guaranteed 2½c per foot, 100-ft. rolls, black leader each end on spools, \$2.75. Inquiries invited. CONTINENTAL FILMCRAFT, 1611 Cosmo St., Hollywood, Calif.

MITCHELL CAMERA, very quiet steel gears, 3 Pan Tachar lenses, Free head, complete studio equipment, excellent condition, \$1300. Camera Supply Co., Ltd., 1515 N. Cahuenga Blvd., Hollywood, Calif.

BELL & HOWELL CAMERA HEAD, 170 degrees three lenses, B & H tripod legs and head, beautiful condition, \$750.00. Camera Supply Co., Ltd., 1515 Cahuenga Blvd., Hollywood, Calif.

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July, 1935

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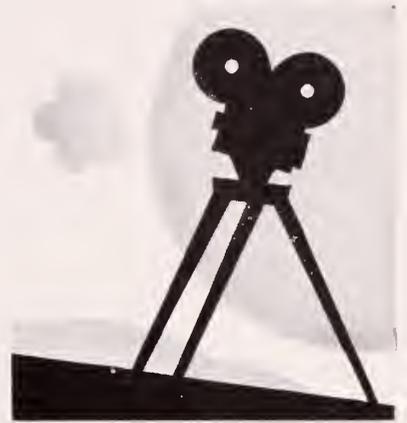
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Next Month

- Due to unforeseen circumstances we were not able to give you a reprint of J. I. Crabtree's paper on Polarized Light presented at the recent S.M.P.E. convention. However, we are promised that it will reach us with illustrations in time to be reproduced in our August issue.
- In its place we have given you a description this month of the new Wide Range Spot Lamp which is considered an important piece of equipment in studio lighting.



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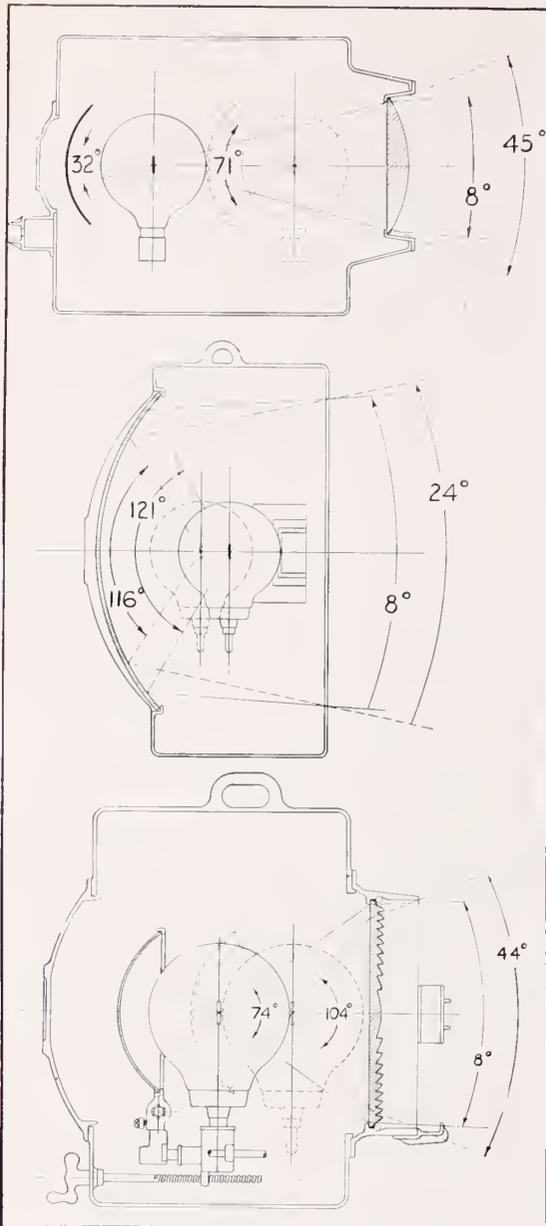


Fig. 1 at top: Schematic sectional view of a typical 2000-watt condenser spot lamp. Fig. 2 center: Schematic sectional view of a typical 2000-watt reflector lamp with 18" diameter parabolic reflector. Fig. 3, bottom: Schematic sectional view of a Mole-Richardson Type 210 Junior Solarspot utilizing a 2000-watt globe as a light source.

MOTION picture lighting equipment divides itself broadly into two classifications—the general lighting equipments which are used to fill broad areas with light sufficient to afford general illumination to exposure levels; and spot lighting equipment, in which group would be included all of the various lamps which project beams of illumination which are usually capable of being varied as to their angle of divergence from narrow beams embracing an angle of 8° or 10° up to wide beams having divergences up to 40° . The spot light equipment is used for back lighting and for projecting light into deep sets where illumination from the general lighting units will not penetrate; also for producing effects such as sun rays through windows, strong light falling from interiors to exteriors, etc. This type of illumination is known as effect-lighting.

Development

For producing the various types of illumination required in the making of a motion picture, a considerable diversity of units have, from time to time, been developed. The requirements have been so diverse that in the course of time studios have gradually accumulated a number of units whose design restricts them to special uses which make them ill-adapted to the average daily problems of the electrical departments.

Spot-light projectors quite logically divide themselves into two groups. In the first group are the reflector type of lamps, which collect the light from the source upon a mirror or reflector whose polished surface converges the light into beams. In this group we have the 18" and 24" sun spots, and the various sizes of sun arc equipment. The other type of light-projector uses lenses as a means of collecting the light and projecting it into beams. In this group of equipments we have the various sized condenser spots utilizing Mazda globes as a source, and the high-intensity carbon arc spots. Each of these classes of projection equipment have certain inherent advantages.

The condenser type of spot, which is schematically shown in Figure 1, affords a very satisfactory distribution of candlepower within the beam. The area of illumination projected from this type of equipment is of relatively uniform intensity throughout the area covered, has relatively high intensity in the center of the area, and an intensity which is greatly reduced at the edges of the beam. This satisfactory distribution may be obtained throughout divergences from 8° up to as wide an angle as 45° in well-constructed spot lamps having plano-convex lenses, used with Mazda globes as a source. To get the best performance from this type of equipment and incandescent-filament globes, it is necessary to fit a spherical mirror behind the globe to utilize the rearward emissions from the filament. This mirror is focused so as to reflect these rays, in the form of an image of the filament, to a position between the coils of the filament, where they can be utilized by the condensing-lens. The schematic representation in Figure 1, which has been drawn to scale from the layout of a typical 2,000-watt condenser spot, indicates the focal of such a lamp, which is its incapacity to collect a wide angle of light upon the condensing lens. As you will note from the drawing, only 32° of combined reflected light from the mirror behind the globe and direct light from the filament are collected by the condenser when the lamp is focused to a divergence of 8° . When the lamp is flooded to an angle of 40° , only 71° of such light is collected. Condenser spots have excellent distribution within the beam, but are of very low efficiency as light projectors.

Figure 2 shows schematically a drawing of an 18" sun-spot provided with a gloss parabolic mirror. Such a reflector-type spot lamp has a useful beam in a narrow divergence of 8° , but when diverged beyond 24° the distribution becomes so defective that it has very little photographic usage. From this schematic layout you will note that on the concentrated beam of 8° , effective illumination

of a Wide Range Studio Spot Lamp

by
Elmer C. Richardson
Mole-Richardson, Inc.

of 121° is collected—from one side of the globe only—and on a 24° diverged beam only 116° of illumination is collected. All light from the aperture side of the globe has to be cut off, under present photographic conditions, by means of "spill rings", which are so designed as to only pass projected rays through their cellular construction.

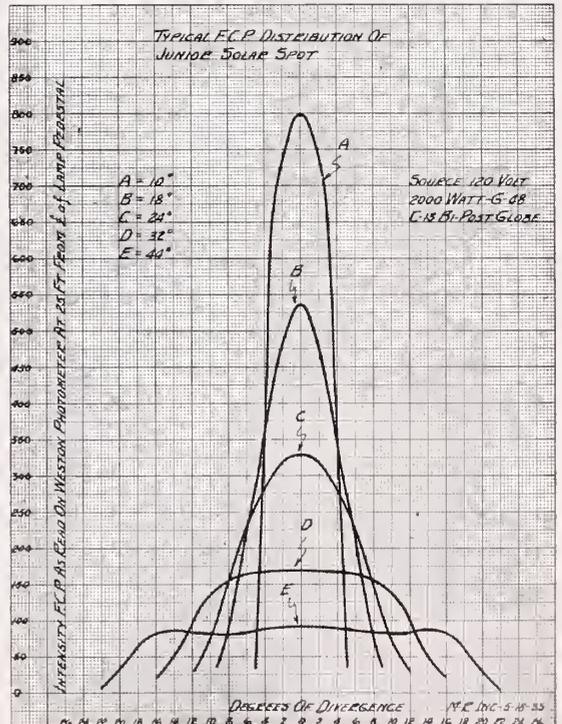
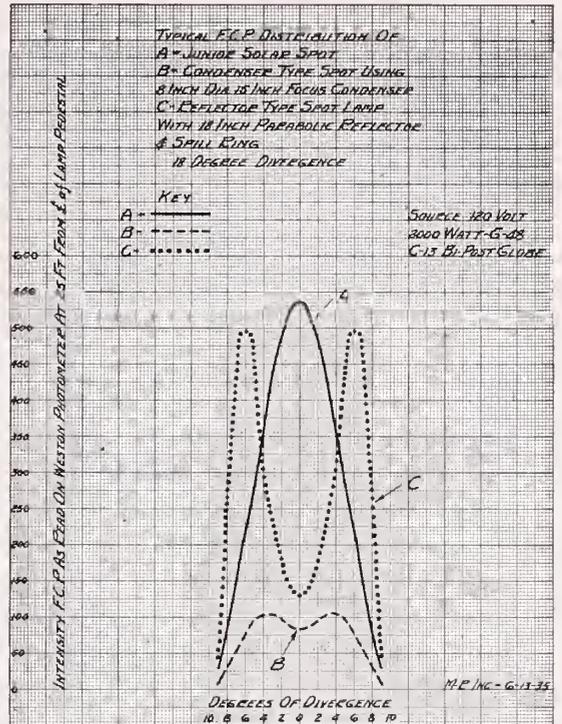
From a study of the schematic layouts of the condenser spots and the projector spots (Figures 1 and 2), it will be noted that the projector spot is much more effective in its collection of light from the source than is the condenser type of spot lamp. The fault of the projector type of equipment is its lack of capacity to afford a good distribution of the projected illumination. The parabolic mirror is a most effective reflecting device when used in narrow divergences, and has long been used in search-lights, automobile head-lamps, and such other types of projecting lamps as are

The M.R. Type 210 Junior Solarspot with an iris diaphragm applied.

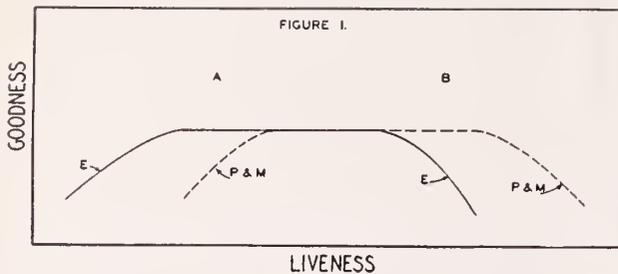


required to project a beam of narrow penetration and high intensity to considerable distances: but when the light source is focused within the focal point of a parabolic mirror, as is the case when these lamps are flooded, the major portion of the projected light is sent out in the form of a hollow cone. When a lamp of the reflector type is flooded out to, say, an angle of 20°, it is found that the light

(Continued on Page 296)



At top Fig. 4: Graphic representation of foot candle power in the beam of various typical spot lamps when diverged to 18 degrees. At bottom, Fig. 5: Graphic representation of the Mole-Richardson Type 210 Junior Solarspot on beam divergences of 10, 18, 24, 32, and 44 degrees.



IN THE development of sound pictures, as in the case of most applied science, developments usually start with the engineer. They consist, at first in the development of equipment, after which comes the adaptation of this equipment to the particular practical needs of the problem. If the enterprise is of a distinctly engineering nature such as building a railroad or a telephone system, this line of attack is successful, not only in the beginning but throughout the commercial operation. However, when the enterprise consists of the application of engineering equipment to an art, as in the instance of talking pictures, the engineers soon find that the problem includes a large number of emotional as well as purely engineering factors.

The main purpose of sound pictures is to furnish amusement to and to create an emotional reaction in the people who attend their showing. In the engineering of sound pictures, therefore, it is necessary to take into consideration factors that do not come normally into most engineering developments and it is necessary to learn new methods of applying the strictly engineering results in order to produce the necessary emotional response in a large group of people called the public.

For some time past the engineering of sound for motion pictures has been considered from this new point of view. Experiments have been performed in an attempt to determine which of the engineering characteristics of sound reproduction the public likes and also to determine those characteristics which are in general annoying to the listener.

The result of these experiments has made changes in the engineers' ideas of the relative importance of the various purely engineering factors. For instance, two recordings of the same scene may be equally good from an engineering or technical standpoint, but one may be very much better than the other in its ability to produce the proper emotional response from the audience.

This leads naturally to the question, "Can a correlation be found between any of the engineering factors of sound reproduction and the emotional reactions resulting?" If such a correlation exists, it is possible to develop methods of using present equipment to aid the director and actor in painting on the screen, in both picture and sound, the emotional reaction which it was desired to produce in the audience. The results of the work of the last few years have answered this question in the affirmative, namely, it is possible to place certain of the factors on a definite engineering basis.

The technician operating the sound equipment is therefore enabled to start his manipulation and adjustment of equipment on a standard basis and to deviate therefrom only for the purpose of producing a particular emotional result desired by the director.

There are two major beneficial results to sound pictures from such a technique; first, the time saved during production to make the necessary adjustments and, second, the fact that on the average better quality of sound and better illusion are obtained without any increased effort or expense.

It should be pointed out that the development of such a technique is not an attempt to engineer art, but is merely

furnishing the operators of the equipment with the means of engineering those factors about which sufficient data exist. This leaves for final adjustment, on the set, only those factors brought about by the requirements of the director's interpretation of the scene.

The engineering factors which have been studied during the last few years with a view to their correlation with the artistic effects are the control of the acoustics of the pick-up, frequency or pitch range, and the volume or loudness range.

Acoustic Control of Pickup

The control of the acoustics of pickup include a consideration of the actual acoustics of the space in which the sound is produced and picked up and also the proper placement of the microphone with respect to the source of sound.

It has been well known for a long time that in different sets or different rooms the microphone distance varied even though the resulting effect which was desired remained the same from room to room. It was believed therefore that the correlation between the acoustic properties of the space and the proper placement of the microphone could be determined. This was found to be correct and a formula was finally arrived at connecting the "liveness" of the recording or pickup with the microphone distance and the acoustic properties of the room in which the sound was being picked up.

During the last two years recordings have been made of various types of sound, including speech, solo singing, solo violin, small orchestra, and large symphony orchestras.

The first reliable data came from the experiments carried out with the cooperation of Leopold Stokowski and the Philadelphia Symphony Orchestra. Records were made under varying conditions of liveness. These records were then played to various juries consisting of engineers, musical groups and members of the lay public (by lay public is meant persons who have no technical knowledge of sound and who listen to sound only for the pleasure which it gives them). From the results of the votes obtained three very interesting conclusions were drawn: first, the engineers, in general, prefer a lower value of "liveness" than do the musicians and lay public; second, that the range of "liveness" acceptable to any one person is quite large and, third, that the average range accepted by the musicians and the lay public overlaps the range accepted by the engineers. This is shown schematically in Figure 1 where the group marked "E" represents the range acceptable to engineers and the curve marked "P" and "M" represents the range acceptable to the public and musicians. In this connection, it should be realized that these curves are typical only and that to a certain extent the liveness which is acceptable depends upon the correlation of the sound with the picture.

This leads to the consideration of a factor connected with "liveness," namely, that the greater the "liveness," the further is the apparent source of sound from the listener. For instance, if a voice were recorded with a "live-

Developments

in Sound Recording and Reproduction

by

J. P. Maxfield

Staff Engineer, Electrical Research Products Inc.

Reprinted from April 20, 1935, Technical Bulletin of the Academy of Motion Picture Arts and Sciences.

ness" lying in the region near "A," Figure 1, it would be judged on reproduction as a good closeup voice; if, on the other hand, the same voice had been recorded with a "liveness" in the region of "B," Figure 1, it would be judged as coming from the point fifteen or twenty feet back of the screen. In other words, by the proper control of "liveness" in recording it is possible to introduce a definite fore and aft perspective into the sound to correlate with the perspective existing in the accompanying picture.

In connection with the correlation of the perspective of the sound with the perspective of the picture, there are two factors concerned. The first is the loudness and the second is the "liveness," which has just been discussed.

Experiments have shown that the amount of fore and aft effect obtainable by change of loudness only is quite restricted compared with the range obtainable with the combined use of loudness and "liveness."

Before leaving the discussion of the "liveness" factor, it might be interesting to give the range of "liveness" which the various juries chose for various types of sound sources. The ranges given in the following table refer to the range of the overlap region of Figure 1. The data on which these figures are based were obtained with the cooperation of Leopold Stokowski, Fritz Reiner and others.

Table I

Piano Solo .....	.4 — 8
Symphony Orchestra .....	.5 — 10
Small Orchestra .....	.3 — 6
Violin, Cello, etc. ....	.15 — 3
Solo Singing .....	.6 — 1.2
Speech .....	.2 — .4

The lower figures given in Table I correspond approximately to a medium closeup where a picture accompanies the sound, while the higher figures correspond approximately to a medium long shot. When extreme closeups are desired, a "liveness" of approximately one-half the lower figure will be found suitable, while for extreme long shots, values twice as high as the larger figure will not be too great.

The effect of recording too close results in a tone quality which tends to sound "thin" and "edgy" and which lacks what the musicians call the "firmness and roundness" which is so highly desired in good music. This disagreeable effect can, and frequently is, partly cured by modifying the frequency characteristic of the reproduced sound in such a manner as to decrease the intensity of the harmonics which are responsible for the timbre or quality.

It will be noticed from Table I that for the types of sound there listed, the extreme range is from 0.2 to 10; that is, about 50 to 1. Fortunately, this extreme range seldom occurs in any one scene and therefore does not introduce the difficulties which might be expected at first. For instance, a voice accompanied by a full symphony orchestra is not difficult to record on a good scoring stage. If, however, the voice in various parts of the song is to be first in long shot, then closeup, then semi-closeup, etc., it is either necessary to know how the picture will be shot before the scoring is done or to find some means of changing the "liveness" of the voice recording after the records have been made and the picture has been cut.

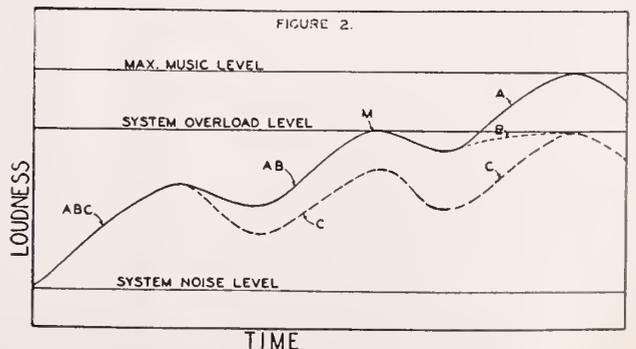
In actual picture production it is frequently customary to pre-score musical scenes and it is therefore necessary to make recordings in such a manner that the perspective can be adjusted in the dubbing process after the picture has been cut. A technique has been developed for accomplishing this result. This technique consists of making two simultaneous records on two separate channels. The first of these recordings should be made with a low enough "liveness" factor to be suitable for an extreme closeup while the second record should be recorded with such a "liveness" factor that it is suitable for an extreme long shot. With these two records available at the time the dubbing takes place, it is possible to obtain any desired "liveness" between the two values originally recorded by the simple expedient of mixing the two tracks in the proper proportions.

The value of this technique cannot be too heavily stressed since it allows to the director complete freedom in the taking and cutting of the picture without reference to the perspective which was originally recorded at the time the pre-scoring was done. The director's use of this freedom in no way detracts from the ultimate illusion produced in the theatre since the dubbing process enables the sound to be adjusted to the picture as the director or cutter has finally arranged it.

Frequency Range

The frequency or pitch range necessary for perfect transmission is large, ranging from approximately 30 vibrations per second (approximately the lowest note on the piano) to roughly 15,000 vibrations per second (namely, two octaves above the top note of the piano). There are other factors entering into perfect reproduction besides merely the frequency range. Two of the more important are: first, volume range, which will be discussed later, and

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Co-ordinating Makeup With Film

by
Max Factor



The Author, Max Factor

MOTION picture makeup exists primarily for the purpose of being photographed. Its application, therefore, is inextricably bound up with the same basic factors that govern the photographic process: the type of film being used, the type of lighting employed by the Cinematographer, and the laboratory treatment given the negative film. Any discussion of makeup which does not take these factors into account, must of necessity be more or less superficial—if not actually misleading.

The first makeups used for motion pictures were merely crude modifications of ordinary stage makeup. The predominant color was a pasty yellow, with weird shades of blue or green for eye-shading. There could be no attempt at coordination, as the products of a number of manufacturers were used, applied generally by the players themselves, as there were few, if any, makeup artists in the Industry. None the less, as nothing better was available, these materials and practices endured for many years.

With the introduction of Panchromatic film, however, the necessity for a complete reorganization of makeup materials and practice became evident to everyone. The earlier makeups, which had sufficed when the Industry was on an Ortho film basis, proved glaringly inadequate once camerawork changed to a standard of Panchromatic film and Mazda lighting. In 1928, therefore, the writer gladly accepted the invitation of the Research Committee of the American Society of Cinematographers to participate in the exhaustive tests of Panchromatic film and Mazda lighting made by the A.S.C. and the Academy. Proceeding from a careful study of the speed, color-sensitivity, and other characteristics of the new film, several completely new lines of screen cosmetics were evolved—the first ever compounded exclusively for motion picture use. These makeups were subjected to the severest tests of the Industry's most exacting Cinematographers, and the ultimate choice governed solely by the decision of these unbiased judges.

The result was, of course, the present line of Panchromatic Makeup Materials, which have since become the world-wide standard. The outstanding characteristic of these materials is the fact that, from the darkest shade to the lightest, the variation is not of **color**, but of **shade**. That is, all are of the same warm tan color; the darker numbers are not obtained by reddening or otherwise chang-

ing the color, but by darkening the shade as a painter would, by an admixture of neutral grey. Therefore, all such makeups, of whatever shade, will respond uniformly to changes of film, light or filtering.

This brings us back to the question in hand: the coordination of makeup with changes in film, lighting, and other photographic factors.

Motion pictures in Hollywood are made principally on stock produced by three firms—Eastman, DuPont and Agfa. All three are of the type generically known as "Panchromatic," or sensitive to all colors, though of course there are detailed differences in the response of the three products. Within the past few years, all three films have been given greater overall sensitivity and slightly different color-balances in the types familiarly grouped as "Super Sensitive" Panchromatic emulsions. Within the past few months, Eastman has further increased the sensitivity of its product with the introduction of "Super-X" film.

What effect must these changes have on makeup materials engineered for use with the original Panchromatic emulsions?

The ideal Panchromatic emulsion would be one characterized by absolutely uniform response to all colors: that is, one whose spectral response, under spectroscopic measurement, would be represented by a straight, level line. In actual practice, spectrograms show a somewhat wavy line, yet one which is (even for the earlier Panchromatic emulsions) a relatively close approach to the ideal. The improvements of the past few years have tended, not alone to increase overall speed, but to "iron out" some of these irregularities.

Panchromatic Makeup was developed to meet the characteristics of the panchromatic emulsions then available; but its chromatic composition is such that it should also work quite as well with an emulsion attaining the absolute ideal, if one were to be developed. Consequently, these makeups should prove equally adaptable to all of the recent improvements which seek a closer approximation of that ideal.

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Nick Musuraca, A.S.C.

Mother Nature Knows Best Is Nick Musuraca's Creed

by
Harry Burdick

WITH Italy his natal scene and with a long line of Roman forebears contributing a cumulative heritage of basic culture, it is not at all surprising that Nick Musuraca, A.S.C., should have a deep sympathy for true art forms. Nor that this congenital culture should motivate his renditions, to the last detail, of contemporaneous cinematographic creations.

Not that Musuraca is of the art-for-art's sake category, a devotee to admirable but impractical ideals. To the contrary, Musuraca represents a fine balance between artistic ambitions and the commercial requirements of his profession. But his inborn old-country traits assure an ever-present filtering of a deft artistry and appealing cultural charm into every product of his cinematographic processes, irrespective of whatever restrictive conditions may be imposed by comptrollers.

A dissertation as to the fallacy of endeavoring to gild the lily or improve the chromatic content of the rose, might

serve to define Musuraca's fundamental of art interpretation. He believes that Nature, herself, is an artist of no mean ability, having devoted some several centuries to the work, and that one can not go far astray by following her precepts.

Hence, his works etched on celluloid contain the warm breath of nature and life as dominating whatever cold brilliant touches of the theatrical school that may be deliberately injected.

To him, every little shadow has a meaning all its own. It is so in Nature's settings. It is so on Musuraca's sets.

But these shadows must, to him, be Nature's lights and shadows, not primarily the theatre's. Hence, he goes in extensively for effects, resting of course on the tale he has to tell. He is staunch in his pursuit for perfection of detail, for of countless correct minute units is the composite picture composed.

He is wholly unconcerned with straight or so-termed brilliant photography. He has yet to see, in Nature, a setting continuously swamped under blinding light. Instead, he finds an ever-fascinating gradation of light tone, in infinite variety of changing effects. These, he proposes to relay to the screen.

And so he frequently dares to ignore some of the old stereotyped traditions that are offspring of stage mechanics but are still the stock in trade of all too many film fashioners.

On divers occasions he has taken his main character entirely out of the customary stream of light, with every expression blatantly set forth, and let the face go dark. The actor's pet grimaces were mercifully shrouded by an absence of revealing light.

A person does not go through life nor through even a series of events with his face constantly bathed in light. There are times, in ordinary course, when that person's face may be entirely in shadow. If so in Nature, why not, queries Musuraca, on the screen?

An interesting instance of this took place a few productions back. He took an entire scene with his star's face black. He established the star entering a room illuminated presumably only by scattered beams from a street-lamp penetrating the window. He established the star's presence in the room by taking him through the shaft of light. But during the star's telephone conversation, the reason for his coming to the room, his face was in full shadow. The audience knew he was there, could hear his words.

But Musuraca held his face quite dark, the expressions undefinable. For the simple reason, he contended, that a person's face need not necessarily be highlighted every time he uses a telephone; indeed, light is entirely foreign to the business of speaking into one.

The star was not particularly pleased that his carefully put on expressions were lost in shadow, nor did the studio important enthuse. But when audiences gave eye to the screening thereof, the reviewers heaped high praise on this and several similar effects. It's the way such things actually are staged by Nature, rather than by a steeped-in-precedent fabricator of matters theatrical.

One of the pioneer trail-blazers of the cinematographic profession—his internship dates to the first Vitagraph era—he is surfeited with scenic artificiality and posing of actors. He strives to capture spontaneity in action and mannerism. To this end, he does not favor too intensive or rigid rehearsal drilling. He prefers to have his characters

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Ray Rennahan, Chief Cinematographer with Technicolor.

Natural-Color Cinematography Today

by
Ray Rennahan

THE starting-point for any discussion of modern natural-color Cinematography should be frank recognition of the fact that for all practical purposes today's three-color process is absolutely new, and has relatively little in common with yesterday's imperfect two-color systems. The addition of the third color has not merely widened the range of color-reproduction, but has made the process infinitely more practical, and opened immense new fields for artistic expression.

The process has fewer limitations, and accordingly, places fewer restrictions upon its users. In the old days, "juggling" colors was inescapable, for the process could not reproduce all colors faithfully, and we had to substitute an unnatural tint for some hue we knew the process could not reproduce truly. This is done away with in to-

day's three-color process, and the Cinematographer can concentrate his attention upon painting his compositions with living colors.

The foundations of any photographic process are exposure and development. In the three-color Technicolor process, the negatives are developed to unvarying standards. Therefore, in order to assure that the three negatives will consistently maintain the correct gamma, the exposure must be maintained with scientific constancy. This is done by the use of accurate, photoelectric illuminometers. In comparison with accepted black-and-white standards, a somewhat higher level of illumination is necessary; but the increase is by no means excessive, and even so, it is being steadily diminished by the advancing speed of lenses and emulsions. Some of the heavier lighters would probably find that the transition from black-and-white to color required only the slightest modification of their normal lighting.

Our interior scenes are at present made under arc lights. Notwithstanding the fact that Incandescent lighting is the accepted standard in monochrome Cinematography today, I feel that there are several important advantages in the use of arcs. In the first place, hard light, as used in our work, is a much closer approximation of natural light than is incandescent light. Therefore, by standardizing on arcs for the illumination of our interior scenes, we are able to use the same cameras for both interiors and exteriors. Otherwise, the change in the spectral emission of natural and incandescent light would be so great as to force us to use either different cameras, or special filters or other modifications which would restrict us considerably. Secondly, the arcs, since they emit so few of the red and infra-red (heat) frequencies, are vastly cooler to work under, and place less physical strain on the players. When SuperSensitive film first appeared, one of the greatest points in its favor was that it required fewer lights, and accordingly less heat: Technicolor, while requiring more light, eliminates virtually **all** the heat. The old bugaboo of "kleig eyes" has been banished; by using a plain glass cover over all lamps, we filter out the optically dangerous wave-lengths. Open arcs are never used on a Technicolor set—and since the introduction of the three-color process, we have never had a single case of "kleig eyes."

No set style of lighting is required: a Cinematographer may employ whatever lighting technique he may prefer. Personally, I have found that I get the best results in color if I light with a trifle more brilliance and contrast, with a stronger separation of planes, than I'd do in black-and-white. Color photography does not lend itself well to overly flat or soft lightings. The shadows, too, require rather more careful balancing than in black-and-white; unless a certain level of illumination is maintained in such areas, there is considerable danger of losing all shadow detail. You can't rely on "spilled light" to take care of your shadows in color to the extent you can in monochrome. Shadows also tend to change the color-values in such shaded areas.

The use of colored light is a phase of lighting which has no parallel in black-and-white technique. The means, of course, is simple: merely placing gelatin screens of the desired color over the lamps. This projected color may be confined to a small area, or spread over the entire set, as the circumstances may dictate. Obviously, this technique offers many opportunities for startling pictorial and dramatic effects; but it should be used with restraint. We

(Continued on Page 294)

"Forget Theories"

Says Todd

by
James L. Fritz

Formerly dramatic editor St. Louis Post-Dispatch



Arthur Todd, A.S.C.

TODD tells us when he begins work on a picture, he forgets photographic theories, he forgets artistic effects, and above all he forgets himself. He strives for one thing: to keep everything in character. He never allows any one thing to become detached from the feeling and mood of the story. His treatment of the subject is the same as his treatment of the story. Todd, if he is given sufficient notice before beginning work on a particular picture, endeavors to become fairly well acquainted with the stars he will be called upon to photograph. This is done, so that he will be able to understand their respective personality and character. It is important for the cinematographer to be a diplomat as well as a psychologist, Todd tells us. For if he is going to keep the story as the principal thing of the production, he must be able to handle the subject in such a way that without allowing the subject to fade into oblivion he will be able to blend the subject's personality into the characterization required and the story will be preserved as the all-important factor.

Todd also believes, the highest tribute which can be paid to a cinematographer by an audience, is, when asked what he thought of the photography, any member of the audience will state that he did not even notice the photography. By making this statement, the public will admit that the story and picture proved so entertaining and interesting, and so well balanced, no one person or one factor was allowed to predominate. Todd claims this balance rests solely upon the ability of the cinematographer. If the cinematographer becomes too engrossed in striving to obtain artistic effects, in the obtainance of any one quality, or in clothing one subject with a dominating personality, the entire production loses its balance and ceases to be good entertainment. When the average audience goes into the theatre, they do not go to study or think, they do not wish to become absorbed in one phase or factor of the production, but instead they wish to be entertained and amused. And it is only through perfect balance that this desired result can be obtained.

Todd claims, there could be good pictures without good photography, but there can never be good photography and bad pictures. The merit of the picture does not depend upon the cinematographer's ability and knowledge, but upon the co-operation with which the entire company works. On the other hand, regardless of the skill of the cinema-

tographer, if the story is not good, if the subject's characterization is not in keeping with the subject's real personality, and principally, if the people working on the production do not co-operate with each other in every way, the final product will not, and cannot be a good picture.

It is because of this necessary co-operation, that Todd believes there is no place for artistry behind the camera. He would far rather be called an able craftsman than an artist. His every consideration is for the studio, for it is studio money which makes it possible to work behind the camera. It is studio co-operation which has brought the cinematographer into public notice, and no tradesman has any right to experiment for self glory on company money and time. Todd refers to the cinematographer as a tradesman, because this is just what he considers the profession to be; a very technical trade. He believes a carpenter, a plumber, or a silversmith, if he has become proficient in his trade, is equally as artistic as any cinematographer.

Todd admits, he does experiment with photography, but only on his own time and with his own money, on 16mm film. He recognizes the fact that lighting plays an all-important part in the cinematographer's work, and with the film company's constant changing of emulsions, constant research and experiments by the cinematographer, are necessary, so there will be no waste of film or loss of time when the cinematographer is called into production. Todd feels every cinematographer should become acquainted with either 8mm or 16mm film. It is not only an inexpensive method of experimental research, but also an excellent way for the cinematographer to improve his efficiency.

Todd is sure that there is a growing demand in the studios for young men with sufficient ambition and common sense. If the embryo cinematographer can forget artistic theories and temperament; if he can forget the glamour of motion pictures, and confine himself to hard work as if he were going to follow any skilled trade, he will soon find himself on top in the cinematographic world. It is because of this belief that Todd is ever considerate

(Continued on Page 292)



PHOTOGRAPHY

of the MONTH

"HOORAY FOR LOVE" (Radio)

Lucien Andriot, A.S.C.: Directing Cinematographer
 Hollywood Reporter (May 16, 1935): "Lucien Andriot's photography is happiest while focused on Ann Sothern."
 Daily Variety (May 16, 1935): "Camera work by Lucien Andriot is of particularly high order, with some trick shots that reflect a thorough knowledge of photography."

"OUR LITTLE GIRL" (Fox)

John Seitz, A.S.C.: Directing Cinematographer
 Hollywood Reporter (May 17, 1935): "John Seitz's photography is uniformly good throughout."
 Daily Variety (May 17, 1935): "Photography of John Seitz is one of the better elements of the picture."
 Film Daily (June 7, 1935): "Photography, Good."

"FRANKIE AND JOHNNIE" (RKO)

Joseph Ruttenberg, A.S.C.: Directing Cinematographer
 Hollywood Reporter (May 20, 1935): "Joseph Ruttenberg, the photographer, rates applause for magnificent magic."

"AGE OF INDISCRETION" (MGM)

Ernest Holler, A.S.C.: Directing Cinematographer
 Film Daily (May 18, 1935): "Photography, A-1."

"AWAKENING OF JIM BURKE" (Columbia)

Benjamin Kline, A.S.C.: Directing Cinematographer
 Film Daily (May 18, 1935): "Photography, O.K."

"PARTY WIRE" (Columbia)

Al Seigler, A.S.C.: Directing Cinematographer
 Film Daily (May 17, 1935): "Photography, First rate."

"FIGHTING SHADOWS" (Columbia)

George Meehon, A.S.C.: Directing Cinematographer
 Film Daily (May 17, 1935): "Photography, Good."

"IN SPITE OF DANGER" (Columbia)

Benjamin Kline, A.S.C.: Directing Cinematographer
 Daily Variety (May 24, 1935): "Photography is Okay."

"IT'S A SMALL WORLD" (Fox)

Arthur Mill, A.S.C.: Directing Cinematographer
 Film Daily (May 21, 1935): "Photography, Okay."

"MOTIVE FOR REVENGE" (Majestic)

Herbert Kirkpatrick, A.S.C.: Directing Cinematographer
 Film Daily (May 21, 1935): "Photography, Good."

"PARIS IN SPRING" (Paramount)

Ted Tetzlaff, A.S.C.: Directing Cinematographer
 Daily Variety (May 25, 1935): "Ted Tetzlaff's photography approaches as one of the finest cinematic jobs of the year."
 Hollywood Reporter (May 25, 1935): "The Tetzlaff photography is A-1."
 Motion Picture Daily (May 27, 1935): "Theodore Tetzlaff's photography is good."

"GINGER" (Fox)

Bert Glennon, A.S.C.: Directing Cinematographer
 Hollywood Reporter (May 25, 1935): "Photography conforms to Bert Glennon's high standard."
 Daily Variety (May 25, 1935): "Bert Glennon's photography is top notch."

"THE ARIZONIAN" (Radio)

Harold Wenstrom, A.S.C.: Directing Cinematographer
 Daily Variety (May 27, 1935): "Harold Wenstrom wields a splendid camera."

"COLLEGE SCANDAL" (Paramount)

Theodor Sparkuhl, A.S.C.: Directing Cinematographer
 Daily Variety (May 28, 1935): "Theodor Sparkuhl has used his camera very effectively."



Bert Longworth, A.S.C., right, and Merritt Gerstad, A.S.C., left, swear this picture was not taken in front of a process screen. Mrs. Longworth, left, and Mrs. Gerstad, right, claim they will appear as character witnesses in case . . .

"THE GIRL FROM 10TH AVENUE"
(First National)

James Van Trees, A.S.C.: Directing Cinematographer
Film Daily (May 25, 1935): "Photography, Good."

"MISTER DYNAMITE" (Universal)

George Rabinson, A.S.C.: Directing Cinematographer
Film Daily (May 25, 1935): "Photography, Good."

"LET 'EM HAVE IT" (Reliance-United Artists)

Peverell Marley, Robert Planck, A.S.C.: Directing Cinematographers
Hollywood Reporter (May 31, 1935): "Photography is excellent."
Daily Variety (May 31, 1935): "Photography by Peverell Marley and Robert Planck is up to general level of picture's excellence."

"CHARLIE CHAN IN EGYPT" (Fox)

Daniel Clark, A.S.C.: Directing Cinematographer
Hollywood Reporter (May 31, 1935): "Dan Clark's photography has a tropical brilliance about it that adds to the atmospheric realism."
Daily Variety (May 31, 1935): "Daniel B. Clark has used his camera effectively."
Film Daily (June 4, 1935): "Photography, Fine."

"NO MORE LADIES" (Metro)

Oliver T. Marsh, A.S.C.: Directing Cinematographer
Hollywood Reporter (May 31, 1935): "The direction is excellent, as is Oliver Marsh's photography."

"THE RAVEN" (Universal)

Charles Stumar, A.S.C.: Directing Cinematographer
Hollywood Reporter (June 1, 1935): "Charles Stumar's photography is excellent and the torture stuff well staged and camera-tricked."
Film Daily (June 4, 1935): "Photography, A-1."

"LOVE ME FOREVER" (Columbia)

Joe Walker, A.S.C.: Directing Cinematographer
Hollywood Reporter (June 3, 1935): "Photography by Joe Walker is splendid."

"CHINATOWN SQUAD" (Universal)

George Rabinson, A.S.C.: Directing Cinematographer
Film Daily (May 31, 1935): "Photography, Good."

"KEEPER OF THE BEES" (Monogram)

Harry Neumann, A.S.C.: Directing Cinematographer
Hollywood Reporter (June 5, 1935): "Harry Neumann's photography is beautiful."
Daily Variety (June 5, 1935): "Harry Neumann has photographed very well."
Film Daily (June 11, 1935): "Photography, A-1."

"UNDER THE PAMPAS MOON" (Fox)

Chester Lyans, A.S.C.: Directing Cinematographer
Film Daily (June 1, 1935): "Photography, Fine."

"THE FLAME WITHIN" (MGM)

James Wang Howe, A.S.C.: Directing Cinematographer
Film Daily (June 1, 1935): "Photography, Fine."

"MURDER IN THE FLEET" (MGM)

Milton Krasner, A.S.C.: Directing Cinematographer
Film Daily (June 1, 1935): "Photography, A-1."

"AIR HAWKS" (Columbia)

Henry Freulich, A.S.C.: Directing Cinematographer
Film Daily (June 1, 1935): "Photography, Good."
Daily Variety (June 13, 1935): "Henry Freulich's camera deftly helps in creating a diverting action film, with technical angles well handled."
Hollywood Reporter (June 14, 1935): "Henry Freulich's photography is just another asset to an entertaining picture."

"MEN OF THE HOUR" (Columbia)

Benjamin Kline, A.S.C.: Directing Cinematographer
Daily Variety (June 6, 1935): "Photography of Ben Kline is very good."

"ALIBI IKE" (Warners)

Arthur Todd, A.S.C.: Directing Cinematographer
Daily Variety (June 7, 1935): "Arthur Todd has done a bang-up job with the camera, using it shrewdly to whip up excitement."
Hollywood Reporter (June 8, 1935): "First-rate camera work by Arthur Todd."

"FARMER TAKES A WIFE" (Fox)

Ernest Palmer, A.S.C.: Directing Cinematographer
Hollywood Reporter (June 10, 1935): "The photography of Ernest Palmer

will get plenty of mention at the time the Academy Award is made. Shooting with a background of inspired set building, the photographs were an assemblage of beauty."

Daily Variety (June 10, 1935): "Ernest Palmer can grab a handful of laurel leaves for his slick photography, especially for some morning scenes in the mist along the towpath."
Film Daily (June 11, 1935): "Photography, Best."

"BORDER BRIGANDS" (Universal)

William Sickner, A.S.C.: Directing Cinematographer, and **Allen Thompson, A.S.C.:** Operative Cinematographer
Motion Picture Daily (June 6, 1935): "The camera work of William Sickner and Allen Thompson is particularly good, and doubly so on the outdoor shots."
Film Daily (June 4, 1935): "Photography, Good."

"JUSTICE OF THE RANGE" (Columbia)

George Meehan, A.S.C.: Directing Cinematographer
Film Daily (June 4, 1935): "Photography, Good."

"THE NITWITS" (RKO)

Eddie Cranjager, A.S.C.: Directing Cinematographer
Film Daily (June 5, 1935): "Photography, A-1."

"ORCHIDS TO YOU" (Fox)

Merritt Gerstad, A.S.C.: Directing Cinematographer
Hollywood Reporter (June 10, 1935): "Photography by Merritt Gerstad is above standard and the production is capital."

"CALM YOURSELF" (Metro)

Lester White, A.S.C.: Directing Cinematographer
Daily Variety (June 10, 1935): "Lester White has photographed very well."

"HONEYMOON LIMITED" (Monogram)

John W. Boyle, A.S.C.: Directing Cinematographer
Hollywood Reporter (June 12, 1935): "Consistently good photography by John W. Boyle."
Daily Variety (June 12, 1935): "Photography is excellent."

"PEOPLE WILL TALK" (Paramount)

Alfred Gilks, A.S.C.: Directing Cinematographer
Film Daily (June 7, 1935): "Photography, A-1."

Developments in Sound Recording and Reproduction

(Continued from Page 285)

second, the reproduction of the sound in its correct position in space. The frequency range available, at present, in the Western Electric Wide Range system is from 55 to 8000 vibrations per second. While this is not as wide as the range required for completely perfect transmission, it is sufficiently wide to reproduce a very large part of the emotional content of the scene being depicted by picture and sound.

With reference to the frequency range, one very interesting engineering factor of emotional value to the public is met with. If the higher harmonics are reproduced satisfactorily (commonly called "cleanly"), they constitute a distinct asset to the reproduction. If, on the other hand, they are reproduced improperly, or if the higher harmonics are obtained by non-linear distortion of lower frequencies, the public strenuously dislike them and would much prefer to have them missing altogether. Throughout all of our tests during the last few years this factor has been constantly encountered and has been one of the real difficulties which had to be overcome before an extended range of frequencies was usable commercially.

Volume or Loudness Range

The volume range for the reproduction of a symphony orchestra is somewhere in the neighborhood of 70 to 80 db. Unfortunately, the present commercial equipment has a considerably smaller range and it is therefore necessary to compress the volume range during the recording process.

Musicians have consistently complained that this compression of volume range greatly lowers the emotional value of music reproduction. A study was therefore made to determine whether or not a method of volume compression could be found which would do to the emotional reaction of the audience to the reproduction a minimum of damage. Some of the earlier experiments performed about 1929-30 indicated a line of attack which showed promise in this respect. During the winter 1931-32 experiments were carried out in cooperation with Leopold Stokowski and the Philadelphia Symphony Orchestra and engineers of the Columbia Broadcasting System with a view to determining a method of volume compression which would do the least damage to the music reproduction of the orchestra broadcasts.

The older and more common method of compression, where a crescendo was involved, was to wait until the volume approached the danger point (overload) and then, by use of control dial, to hold it down within safe limits. A reference to Figure 2 will make this clear. The line near the bottom of the figure labeled "System Noise Level" represents the

lowest level which can be reproduced without serious disturbance from background noise. The line labeled at the left "System Overload Level" represents the loudest sound that can be reproduced without an overload of the equipment. The second line at the top of the figure, labeled at the left "Maximum Music Level," represents the level which would have to be reproduced if no change in the control dial were made during the playing of the crescendo illustrated in the figure. The full line "A" represents the loudness plotted against time for the actual crescendo as played by the orchestra. The line "B," which for a considerable portion of its distance coincides with the line "A," shows the older method of volume control. The line "C," which also coincides for a small portion of its distance with line "A," represents the recorded volume in accordance with the new method of control.

The procedure in the case of the experiments leading to this new method was somewhat as follows: During the Friday afternoon concert preceding the broadcast, the volume was controlled in the manner shown by the line "B" and a musical score of the selection was marked to show, first, the measure at which the change must be completed in order to avoid overload and, second, the amount of compression required to avoid overload.

This marked score was then taken to Mr. Stokowski and he indicated on the score the measures at which the compression should take place and the amount of compression that should take place during these measures. During the broadcast the mixer merely followed Mr. Stokowski's markings on the score.

After the season's broadcasts, a study was made of the volume control as finally used and among other results one very interesting one was discovered. Practically none, or at most very little, of the decrease in volume during the crescendo was made while the orchestra was itself increasing in loudness. Reference to Figure 2 indicates that the crescendo depicted there rises, then drops a bit, rises again, drops a second time and then takes its final burst to the top. This type of rise was present in more than half of the large crescendos which occurred during the broadcasts.

Further reference to Figure 2 shows that the volume was decreased, for the most part, during the interval when the crescendo was temporarily decreasing in loudness and, further, that the full compression had been completed prior to the lost rise. This means that in spite of the fact that the range had been compressed, a compensating factor of increased contrast between the rise and

fall during the crescendo had been introduced which tended to offset to a large extent the loss in volume range.

The method of lowering a diminuendo was exactly similar only reversed in direction. Most of the volume control necessary to lift the softest passage out of the background noise was accomplished in the early part of the diminuendo and was usually accomplished during the time that the orchestra itself was increasing its loudness.

During the early work which led to these later experiments one amusing, and also instructive, situation arose. In this case a musical short was being prepared. The orchestra in use was small and its volume range did not exceed the range of the equipment then available. It was therefore possible to make the recording without compressing the volume at all. However, the orchestra leader permitted his orchestra to reach the maximum volume at the place in the crescendo corresponding to the point "M" in Figure 2 so that the orchestra had no reserve left for the final burst. Three takes were made under these conditions, the first two being made with no operation of the mixer dial. On the last take, as an experiment, the author reduced the volume 6 db during the early part of the crescendo and increased it back again at the time the final burst should have occurred. When the orchestra leader heard this third take, he remarked, "That is funny. That is better than the band played it."

It will be seen from the foregoing that the full use of this technique requires thought and musical knowledge on the part of the mixer as well as close cooperation between the musical director and the mixer.

"Forget Theories" Says Todd

(Continued from Page 289)

of his crew. He tells us that he is constantly striving to help every member of the crew become more proficient in his work, and whenever the opportunity for advancement presents itself, Todd is the first to recommend some member of his crew for the post.

Few men can honestly say they "practice what they preach," but Arthur Todd can. He left school at the ripe old age of fourteen and ran away from home. He was fortunate enough to find immediate employment in a studio and began serving his apprenticeship, as he calls it, as a cinematographer. In all his twenty years in the industry, he has never turned from the channel of hard work, he has never allowed himself to become self-centered, and above all, he has never allowed any temperament to interfere with his work. Perhaps it is because of this belief in his work as a trade, that today finds Arthur Todd on the top of the heap, unspaired and still an able craftsman.

B I G N E W S

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Natural-Color Cinematography Today

(Continued from Page 288)

have found, for instance, that projected color is best used on sets, and only sparingly on people, except in dance numbers.

Projected color has been and will always be an ace in the hole for the cameraman. When a set is too monotonous, or a stage sequence needs an added "kick," projected color is usually the answer.

Contrary to some opinions, this is no newly-discovered technique. Projected color was used quite extensively in all the stage numbers of "The American Venus" in 1925, and in the more recent "King of Jazz" there were many striking effects. Especially memorable in that production was the dance on the drum by Jack Cartier in the "Rhapsody in Blue" sequence. The colored light, striking his black body and throwing huge, grotesque shadows, drew many favorable comments from both press and public.

Another field for projected color is in mystery and horror pictures, where its use is unlimited. In "Doctor X" and "Wax Museum," projected color played an important part and added greatly to the dramatic sequences and effects. Up to the time of "Wax Museum," projected color was restricted somewhat by the limitations of the two-color process, but with the new three-color process it opens up a wide range of possible effects. This was well demonstrated in "La Cucaracha," where it was used quite generally on the sets, but sparingly on faces—and then only for special dramatic effects. Used indiscriminately on faces, it would undoubtedly be bad, and interfere with the continuity of the story; but properly used, it can be extremely effective.

At this point, it may be well to mention that despite the fact that we use arc lights, and, as a rule more and larger units than would be required for comparable monochrome camerawork, with larger and heavier cameras and blimps, I have not found that color camerawork hindered production in any way. We can make any normal shot that can be made in black-and-white; our blimps are, perhaps, the quietest in the industry; and we have proven that we can work with the same efficiency as comparable black-and-white units. The late Lowell Sherman, under whose direction "Becky Sharp" was commenced, even paid us the compliment of saying that we were working as fast as he had on his previous production in black-and-white!

The tricolor camera brings with it an entirely new conception of makeup. Hitherto, makeup has concerned itself only indirectly with color. Now it must concern itself, not only with retouching

away imperfections of contour and texture, but with maintaining and often enhancing the natural coloring of the complexion as well. Makeup must appear natural in every way if it is to photograph well. It would be perfectly possible to photograph a three-color production without using any makeup at all; but we have found that the best results are had if the players wear enough makeup to soften any imperfections of skin and contour, and to maintain even flesh tones throughout the production. Sunburn, tan, and so forth, can cause noticeable variations in ordinary pictures, if not corrected by makeup: you can imagine the result of a player's suddenly getting sunburned in a color film! Our makeup should be extremely light—scarcely more than a powder-base, with only the most natural rouge and lip-makeup in the case of women. None of the players of "Becky Sharp" would have excited any comment had they worn their makeup on the street.

Character makeup must naturally be modified to conform to the same standards of naturalness. The best test of any makeup for three-color pictures is a glance in the mirror: if the makeup appears natural in the glass, it will be natural on the screen.

Close cooperation between the Art Director, the Costumer, the Director and the Cinematographer is even more vital in color than in black-and-white. Everything should be planned and executed to play its perfect part in a coordinated whole—and this condition cannot apply if any one of this all-important quartette tries to exhibit individual brilliance at the expense of the others. May I add here that the Cinematographer who has a Director of Rouben Mamoulian's ability, who will not only cooperate, but go out of his way to help the camera crew get the desired results, as he did on "Becky Sharp," is indeed fortunate. I wish to take this means of thanking Mr. Mamoulian and also Robert Edmond Jones for their cooperation.

Technicalor, through its Color Control Department, under the direction of Mrs. Kalmus, is ready to aid in bringing about this desirable coordination, helping the studio's picture-wise artists to learn what to do, and especially what not to do, in designing for color films. None the less, a potential situation exists which will eventually call for all the diplomacy and character that Directors and Cinematographers can exert. Sooner or later, the day is coming when Cinematographers throughout the Industry will be wise indeed if they keep an eye open to the problems and the opportunities that color will surely bring forth.

Mother Nature Knows Best

(Continued from Page 287)

perform against his sets as they do in Nature's setting.

His current work, "Old Man Rhythm," is not an especially weighty tangle. It is a musical dealing with the prevailing scenarists' conception of goings-on amid co-ed campus life, after the formula set as standard by George Ada.

The mere fact that musicals have always been photographed in high key was no index to Musuraca that he should follow that well-trodden road. Rather, he deliberately set farth to render it in as low a key as possible. The result is extremely interesting. It may, indeed, establish a new precedent in the chapter of musical production. For it is by far done in the lowest key of any musical to this date.

He has lost nothing of the appeal gained by high scintillating scenes so generally employed in works of this type. In their place he has elaborate numbers done in silhouette and semi-silhouette that are superb—with the added merit of being original.

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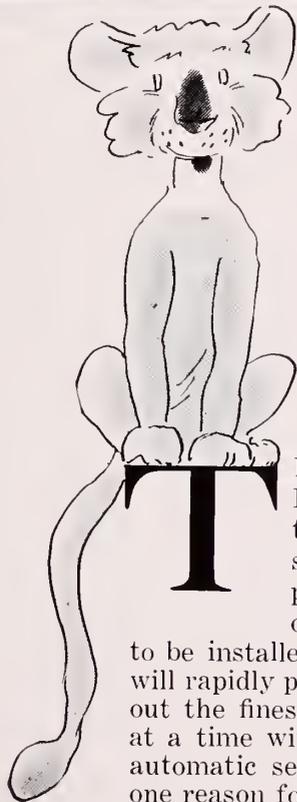
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Musuraca is a conscientious practitioner of the cinematographic arts. His devotion to the assignment at hand is exceptionally thorough. With painstaking care he supervises his painting staff as they place exactly the desired depth of shadows on his sets. He uses tones of blue paint for this purpose.

Generally speaking, his quantity of light is much less than commonly utilized.

His complete information pertaining to the media he employs takes him into

close harmonious follow-through with his laboratories. He views his negative, of course; the following morning, he views the print as well. He is witness to the release prints, also—that the full worth of his cinematographic effects may be conveyed to the screen in undiluted measure.

As with all creators of art forms, Musuraca is ever unsatisfied. Always he is striving for results closer to his own standards of perfection. His "best" picture, he says, has not yet been photographed. It probably never will be. For no matter how ample any production may fill contemporary levels of artistic merit, the true artistic heart that is within him will drive him on to still greater achievements.

DEVELOPING A STUDIO SPOT

(Continued from Page 283)

projects into the form of a ring or "doughnut," having high intensity in the edges and relatively low intensity in the center.

The Mole-Richardson "Junior Solarspot" is a spotlamp of entirely new design, which has been developed to retain, in so far as possible, the advantages of both the condenser type and projector type of equipment, while avoiding the faults of those equipments. This new type of spot lamp is schematically represented in Figure 3. The change in the form of condenser lens immediately distinguishes this type of spot lamp. Instead of the conventional plano-convex condenser, a Fresnel type of plano-convex condenser has been designed for the new lamp. This Fresnel type lens is a plano-convex lens approximately 10" in diameter, made of the finest heat-resisting glass, and designed to be of relatively short focus. The lamp is designed for operation with a 2,000 Watt bi-post type Mazda globe. The reflector behind the globe is a spherical mirror whose radius curvature has been designed to, at all times, concentrate upon the condenser lens the light falling from the rear of the globe, which would otherwise be lost. This lamp, when "spotted" to an 8° beam, collects 74° of combined direct and reflected illumination upon the condenser lens. In the "flooded" position, when diverged to an angle of 44°, combined illumination of 104° is collected. By carefully designing the spherical mirror equipment, the advantage of efficient light collection, characteristic of reflector lamps, has been obtained. By controlling the projection through the Fresnel type lens, the advantage afforded by the condenser spot, of an excellent distribution of illumination within the beam, is afforded.

To those whose technical training en-

ables them to interpret mathematical data from graphic representation, Figures 4 and 5 are worthy of consideration and study. Since a great deal of motion picture work demands beam divergences of around 18°, Figure 4 has shown the plotting of distribution of the three typical motion picture lamps. The solid line "A" shows the distribution of the new "Junior Solarspot." The broken line "B" shows the distribution of a typical condenser spot as schematically represented in Figure 1. The dotted line "C" indicates the foot-candle distribution of an 18" reflector spot equipment with a glass parabolic mirror and with a spill ring. The curves in Figures 4 and 5 are all directly comparable, all readings having been made from the same 2,000 Watt G48 C13 bi-post Mazda globe, at its rated voltage of 120; the Solarspot and the condenser spot both being provided with suitable spherical mirrors for effectively utilizing the light from the rear of the filament.

The curves reveal both the advantages and the disadvantages of the various types of equipment. Curve "B" indicates that the distribution of illumination from a condenser spot is quite satisfactory, but its low intensity indicates inefficiency. The M-shaped curve "C," showing the distribution of illumination from a parabolic mirrored spot indicates graphically the intensity of illumination at the edges of the beam as compared with the intensity at the center. As a collector of illumination, the parabolic mirror is efficient; but it does not put the light where the Cinematographer requires it. The Junior Solarspot, as indicated by curve "A," shows an almost ideal distribution, with the high intensity in the center, and with edges that taper to low intensity and permit the overlapping of illuminated areas without

building up areas of higher illumination in the overlaps.

Figure 5 gives additional information regarding the distribution of the Junior Solarspot, all measurements being comparable with those shown in Figure 4. In this graph are shown typical distributions for divergences of 10, 18, 24, 32, and 44 degrees. The development of this new equipment extends its range for all uses within its illuminating capacity where divergences are required from an 8° narrow spot-beam to a 44° flood-beam.

The Junior Solarspot is particularly adapted to beam-control by means of an adjustable iris-diaphragm, as shown in the photograph, Figure 6. By controlling the diaphragm opening in combination with the focal adjustments, a wide range of intensity can be obtained from this equipment **without altering the divergence angle.** We anticipate that this lamp will be very useful in the fine modelling of closeups when the iris diaphragm control is applied as it provides a means of adjusting light intensity without altering the spectrum characteristic of the projected illumination as is the case when dimmers are used, or when diffusing mediums are used to restrict the light intensity. As color photography begins to hold a more important place in the motion picture business, control by means of the iris diaphragm will be found particularly advantageous due to the fact, already mentioned, that the color-value of the illuminant is not altered.

Co-ordinating Makeup with Film

(Continued from Page 286)

Experience has proven this to be the case. The introduction of the Super Sensitive emulsions, four years ago, brought no need for changing the color of the makeup, though the changed speed of the film necessitated a change in the shade of the makeup used to produce any given effect. The same is true of the new Super-X film: its color-balance may have been altered sufficiently to be noticeable to the research laboratorian, but not enough to disturb the relation between the color-vision of the panchromatic type emulsion and panchromatic makeup. The increased overall speed of the new film, however, should call for a corresponding change in the shade of makeup used.

Now we have long known that a man who works in a low key—who uses relatively little light—will get the best results if his players are made up in a relatively light shade, while a man who works in a high key, using a greater intensity of light, will be better pleased if his cast wear darker makeups. In the

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same way, a blonde woman would be made up a bit darker than a brunette—not only to furnish a more pleasing contrast between hair and skin, but to offset the added light frequently needed to balance the "hatter" back-lighting on the blonde hair.

With the earlier types of Panchromatic film, the basic makeup for the average actress was a No. 24, with the male players wearing No. 26, two shades darker. When Super Sensitive emulsions were introduced, we found that the increased speed was tantamount to a considerable increase in the key of the lighting; therefore, the basic makeup for the average actress became the No. 26, with the man darkened to No. 28. The actual increase in the film's speed was over 200%: therefore, since the makers state that Super-X film is nearly 100% faster than SuperSensitive, we might logically expect that the new emulsion would require makeups one shade darker. This is the case, and where an actress might be accustomed to wearing a No. 26 makeup for SuperSensitive, the change to Super-X would necessitate a No. 27.

For DuPont "Superior" film, the basic makeup for women is usually a No. 25, with a No. 27 normal for men. In some studios, however, the Makeup Artists have found it unnecessary to differentiate between Eastman SuperSensitive and DuPont Superior except in the application of rouge, using a light rouge for the Eastman film, and a darker shade for the DuPont.

Agfa "SuperPan," probably because of its extreme red-sensitivity, takes the same makeup as used for Eastman "Super-X."

These observations, however, are necessarily generalized, and cannot apply to specific cases. Many factors, including the texture and absorptive character of the player's complexion, the Cinematographer's style of lighting, and the processing in the film-laboratory, must be reckoned with in solving specific problems of mokeup.



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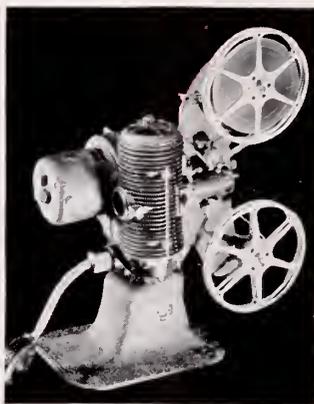
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FILMO

PERSONAL MOVIE CAMERAS
AND PROJECTORS

PROFESSIONAL RESULTS WITH AMATEUR EASE

AMATEUR MOVIES

this issue

Charles Herbert gives the Magic
Carpet Formula

How to Make a Wipe-off Gadget

Putting Sound in Silent 16mm Film

Shooting Pictures at San Diego
Fair

Formula and Method of Home
Reversal

... and other features

JULY
1935
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AMATEUR MOVIE SECTION

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Next Month . . .

• We have a gadget to offer you next month that is one of the most interesting pieces of equipment conceived by an amateur and built by him at the price of only a few dollars. We know that many readers will find a great deal to interest them in this gadget. It was conceived by an amateur and sent us in our gadget and trick contest.



PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

MAGIC carpet cameramen receive a great variety of assignments—some are far away, others are just around the corner of everyday life; some are hard, others easy; one requires a week's work while another takes six; but the general order remains the same. "Make the picture tell the story."

When you go out to cover a commonplace subject, that is the time you have to scratch below the surface to get the material needed for an outstanding reel. Many seemingly uninteresting spots on this old globe will yield a harvest if you use a fine tooth comb and all the resources you have stored up from experiences in more fertile fields.

Find yourself dropped down on the Island of Bali, among the fisher folk of Zyder Zee, in Timbucktoo or Paramaribo and there is a picture at every turn of the trail. You will keep the film buzzing through your camera and probably end up short of film with many interesting shots not covered. But set your camera up on the quiet countryside of England or the United States and you will have to think twice before shooting.

This summer if you have the privilege of visiting or living in the country, rural life is a good subject to try out—an ordinary subject which can be made into an interesting reel with a little thought and effort.

There are always a few fundamental rules to follow so it is best to acknowledge the difficulty of your immediate task and tackle the job accordingly. First as your subject matter is commonplace, you must put it over with special emphasis on camera treatment.

A tree is a tree after all, but if you can find one with a little individuality, that is knotted and scarred, that is the one you want to use for a countryside scene. Set it off with a cloud and the interest heightens. Trees give character to a landscape so keep your eyes open for the ones that are typical and representative of the country you are working in.

Houses are common sights, but give another opportunity for characteristic atmosphere of your subject. Many houses are built on the same style and it might seem that any one would do. But don't content yourself with a shot that might be duplicated in a hundred different places, keep looking and poke your picture eye around the corner until you find just the right set-up. The house should not be shown in full front view but rather at a little side angle so that the front and part of one side are seen. You must also be far enough away so that some local foreground can be included in the scene. And above all, shoot so that your scene will not look like a real estate photograph!

If there is a road leading from the house, a little natural action can be arranged to make your scene alive. Otherwise, a section of a fence or a bit of a brook in the foreground provides a spot for life such as a brood of ducks in the water or several cows grazing just beyond the fence.

Such scenes as these can go to make up the introduction of your story. Many details can be added to extend the sequence—closeup of birds in a tree, a bee buzzing around a flower, a grasshopper on a blade of grass, a squirrel in a tree, and scenes of artistically lighted bushes against a cloud-flecked sky. Most shots of this nature will require a low camera position as it is a safe rule to follow that flowers, small animals and insects are shown to the best advantage if photographed with the camera hori-



Documentary

zontal and not looking down. This rule is one of the "don'ts" that should be permanently fixed in the mind of a camera enthusiast. Rarely would you make a shot of a human being looking down at him; likewise, you should not shoot animals that way.

A baby tripod with very short legs provides the camera position and should be a part of your regular everyday working equipment. You will have to get in awkward positions, yourself, to make these shots but they are well worth the effort.

With the foundation for an introduction laid down with general views and augmented with sufficient footage of intimate closeups, your next move should be in the farm yard, hunting for the bits of life that make the wheels of country life go around. Such a film as this needs scenes that portray the soul of your subject. All the little chores which go to provide the necessities on the farm must be included, so, once inside, cast your camera eye around and as soon as it rests on some bit of action, set up and record it. It is safe to say that no subject will provide more different kinds of work and angles from early morn till late at night than right here on the farm within easy reach.

Out in the shade of a backyard tree Grandpa can be found churning butter. Don't make a stereotyped picture of him but spot the churn in a mottled shade of leaves from a tree so as to create a pattern of lights and shadows on your subject. Get a full closeup of his jovial face. If any children are sitting around, arrange them so that you can make a closeup cut in shot of them watching the operation expectantly. And when the butter is churned and you have made scenes of Grandma taking it out, a good human interest shot can be made of the kids drinking



Picture of the Old Farm

by
Charles W. Herbert, A.S.C.

buttermilk—not forgetting the chickens trying to sneak the porticles of butter that drop to the ground.

While Grandma is potting the butter, a very low camera position will give you a novel angle. Her hands and the butter in the close foreground appear distorted and the action is emphasized while her head shows up smaller in the background. Such a shot does not have any particular significance but it does odd variety which is always an asset and distinguishes your work.

Keeping alert, you can be on the job as the rural postman brings the mail. This gives an opportunity to work in a shot of the gate and yard and a short panorama following him will show a section of the country road. If flowers are on the orch above the gate or elsewhere, shoot the scene from an angle that shows them. Then flash in a closeup for effect.

It's easy to find a natural shot of children of the house while they are absorbed in some form of study. It usually takes a little patience to get these scenes but they are always valuable to your story. Watch for good lighting ef-

fects, especially back lighting aided by a reflector, and try to shoot as they smile or make some natural gesture. The boys of the farm can't be left out and they will probably be found doing some chore which they consider a man's work—driving in the horses, hitching up the team or bringing in a load of hay.

To record scenes representative of real farm life, you must go afield where the men are working. Always harvest time gives more opportunity for real labor. Even with modern machinery there is still much work for man and beast. In covering this sequence, go in for action scenes primarily—especially detailed moving parts of the harvesting machines with their various eccentric movements. Good human interest shots that show head closeups with sweat on the brow and closeups as a man grabs a drink in a spare moment can be added.

Go to the cow shed while the hired man is milking. Here is where you can get many different scenes to work into one complete interesting sequence. Start off with scenes of driving in the cows, selecting a setting that has lights and shadows along a lane or field. Pick up a smooth closeup shot of a spotted cow meandering along. Be inside the shed as they come in the yard and enter the door just in front of the corner. Select a spot in the shed where some beam of light comes in from the windows. You may have to remove a section of planks to get this effect. Make a closeup of the man milking, a closeup of his hands and follow down to the stream of milk in the pail. By all means try to get a scene as the cow switches her tail and hits the man in the face. If she kicks at a fly and knocks over the pail of milk, so much the better—far your picture. Enlist the service of the bornyard cat to sit by with an anxious eye on the spattering milk. With a good head closeup of "bossie" as she chews her cud, your sequence is complete. Watch the light throughout this sequence and try to use a beam of light to give the impression of an interior and at the same time to illuminate your subject sufficiently to record details in the foreground, leaving the background dark.

A closeup of the dinner bell swinging away its call to the four corners of the farm will start off a series of good natural scenes that tell the story in a convincing way. Make

(Continued on Page 318)

Home Reversal Development of Movie Film

by
Charles E. Keevil

HERE is an increasing number of amateur movie enthusiasts who are becoming interested in doing their own developing rather than sending their films in to a commercial laboratory. In the past, these amateurs have been limited to the negative-positive system because there was little information available on the reversal method of development which is used by the film manufacturers in processing their product. However, making a positive out of the film used in the camera, by reversal development, is not at all difficult and with the instructions following anyone who likes to develop his own pictures can easily master the process.

At the start it is well to understand just what reversal development is and the two basic methods of accomplishing it. In reversing, the film is first developed into a negative; then the negative image is bleached out, or dissolved away, instead of having the remaining silver bromide dissolved out in hypso with ordinary negative development. When the negative image has been dissolved away, the silver bromide remaining in the emulsion is in the form of a positive image; so it is exposed to light, or flashed, and put back in the developer which develops up the positive required for projection. It sounds quite simple and it isn't hard to do once the various operations are thoroughly understood.

There are two ways of carrying through this reversal development, the total flash and the printing methods, which the amateur must not confuse in his mind. In the first or total flash method, ALL of the silver bromide in the emulsion is used in the negative and positive images, so fixing in hypo is not required. In the second, or printing method, all the silver bromide is NOT used up in the two images so fixing is required to remove that left in the emulsion. Since the total flash method is the simplest for the beginner, it is recommended that it be mastered before going on to the printing method which has advantages that will be explained later.

Before going on to instructions for reversing with the two systems, a word should be said as to film and equipment to be used. Since the manufacturers of reversal film charge for the finishing with the sale of the film, there can be no object in the amateur reversing that type of film. Negative film nowadays is nearly all made with a non-halation coating that is more or less objectionable in a positive. However, very good results, except for color rendering, can be obtained on ordinary positive film stock which can be readily obtained in both 16mm and 8mm double perforated for splitting into two 8mm films. The following remarks are therefore confined to positive stock which has the advantages of low cost and the possibility of being handled in a bright red light so the amateur can easily see what he is doing.

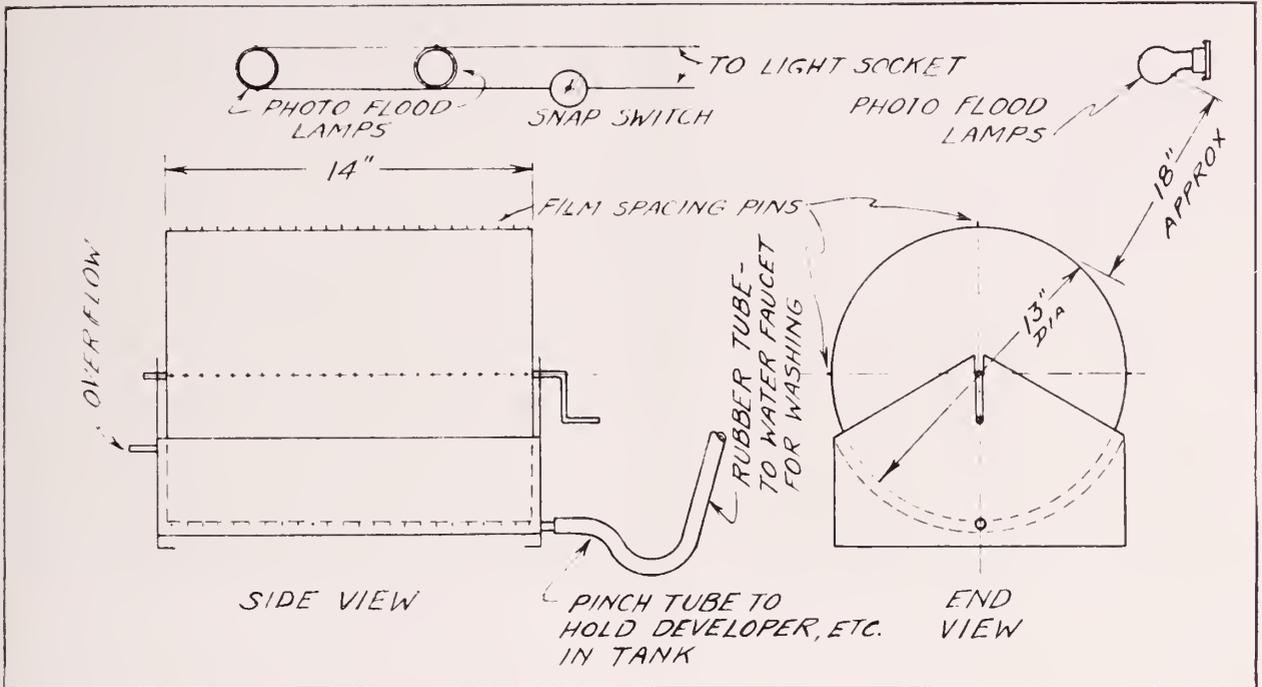
The equipment needed is quite simple and can easily be made by most amateurs. A developing drum similar to that shown in the accompanying illustration is the first requirement and should be a solid rather than skeleton one if the printing type of reversal is to be tried, although total flashing can be done on the open type. A round

bottom tank for the solutions is required; the drum being mounted so the film will revolve through the solutions as the drum is turned. Many designs of drums and tanks have been published so no repetition will be made here, the amateur should build one to meet his own needs as to size, film capacity and material. Wood is the best material but hard to make watertight. Sheet metal with soldered joints will serve satisfactorily if the whole drum and tank is well protected by a good enamel such as black Waterspor or the special photographic enamels. The tank should be arranged with drains so the solutions can be changed quickly and so running water can be introduced for washing the film. A skeleton type drum for drying the film should be mounted so the film can be wound easily from the developing drum onto the drying drum. Lights for flashing the film, which will be described under the various methods, and a red dark room lamp complete the larger items of equipment.

TOTAL FLASH METHOD

As the positive image in this method of reversal is made from ALL the silver bromide left in the emulsion after the negative image is dissolved away, it is important that enough be removed with the negative image so that the positive will not be too dense for projection. This means a very full exposure in the camera and with positive stock two stops longer than for regular panchromatic reversal film will be about right. Due to its lack of color sensitivity, under light conditions deficient in blue, positive stock will require even slightly more exposure. A good photo-electric cell exposure meter is a big aid in securing even exposure throughout the roll of film which is desirable for all reversing.

When ready to develop the roll of film, it is wound on the drum, emulsion side out, and the ends fastened with rubber bands to take up the slack as the film expands when wet. The developer is poured in the tank and the drum revolved through it until development is complete. When complete, the emulsion side of the film should appear a dense black while the negative image should show through the back of the film quite strongly. This appearance of the film would indicate a strong over-development for a negative, but it is necessary in this system of reversal to force the negative image through the emulsion or the positive will be too dense for projection. With the following



developer formula, it is almost impossible to overdevelop if the exposure has been as indicated.

Metal	22 grains
Hydroquinone	88 grains
Sodium Sulphite	1.25 oz.
Potassium Carbonate .....	.75 oz.
Potassium Bromide	8 grains
Water	1 quart

This developer works best around 68 or 70 degrees and should develop a properly exposed positive film in around eight minutes although longer or shorter time can be used to get the desired appearance of the negative image.

When the negative image is fully developed, the film is rinsed in water and then bleached in the following bath:

Water	1 quart
Potassium Bichromate .....	.77 grains
Sulphuric Acid (concentrated).....	1 1/2 drams

Revolve the drum through this bleach until all traces of the negative image are dissolved away. This should not be hurried but should be done thoroughly. The bleach will leave a stain on the film which must be removed in the following clearing bath—rinse the film in water, then clear in:

Water	1 quart
Sodium Sulphite	1/2 oz.

Revolve the film through the clearing bath for **several** minutes as this alkaline bath will also neutralize the acid left in the emulsion from the bleach—this is quite important as any acid in the emulsion will prevent development of the positive image. The white lights can be turned on when the film is put in the clearing bath and it will be easy to see when the stain is all cleared from the film. The white lights meant here are the general illumination ones in the room—not the photoflood ones shown in the illustration which are used only with the printing method of reversal. At this stage of the development the positive image can be easily seen by transmitted light.

After clearing, give the film a thorough washing, re-

valving the drum through clear water which is running into the tank and out the overflow. Ten minutes should be enough and it can be done in white light as it is desired to develop up all the remaining silver bromide in the emulsion.

After washing, return the same developer to the tank and re-develop the film which will now have the positive image on it. In order to be sure that all the silver bromide is reduced to silver, an ordinary lamp on an extension card can be brought up close to the drum while development is progressing. This prevents any uneven exposure the film may have gotten during the clearing and washing operations. On a skeleton type drum, this is quite important, otherwise bar marks will show where the film got heavier exposure (from both sides) between the bars.

When fully developed, the film is again washed about ten minutes and then wound on to the drying drum, being squeegeed through a chamois skin or viscose sponge. Wet the chamois or sponge then wring out as dry as possible and run the wet film through two pieces with sufficient pressure to wipe off all surface moisture but not hard enough to damage the emulsion. In cold weather this presents no difficulty, but in warm weather the emulsion will be too soft unless it is hardened. To harden the film, it is revolved through the following hardening bath for three or four minutes after the first development and before the bleach:

Water	1 quart
Potassium Chrome Alum.....	1 oz.

Film that has been squeegeed properly will dry very rapidly and without water marks even though the drying drum is not revolved while it is drying.

Very good positives can be made by the foregoing method if there is sufficient light for proper exposure in the camera—the heavy exposure needed being its only limitation. It is simple to carry through as judgment is not called on at any time except in determining the length of the first development—all other operations can not be overdone, the only danger being in slighting them! All operations except possibly the first development, should be carried to com-



Putting Sound on Silent

THE next big step in amateur movies will probably be sound. It doesn't take much of a prophet to guess that, but it is causing a lot of questions to be asked. People are wanting to know what they are going to do with their old silent subjects, how they are going to afford a sound projector, whether they are going to be able to make their own sound pictures, how can they get duplications made, and a thousand and one other questions.

For the serious amateur, the new 16mm sound cameras on the market will record the synchronized sound he will want to make. However, there are going to be a number of problems for him to overcome. He is going to have to learn something about sound recording just like he had to learn the fundamentals of photography before he could make good pictures. If he doesn't know these fundamentals his sound will be just as bad as his pictures are when he doesn't follow fundamentals. There is still the problem of making duplicates of 16mm sound films which has not yet been successfully solved. The duplicates which have been offered so far have been made by the duplicate negative process. This is all right for the picture, but a lot of the sound quality is likely to be lost by using two processes. By using the reversal method of making duplicates of sound films the background noise can be kept down, more of the fine lines preserved, there will be less trouble from slippage (very serious in 16mm) and the whole result will be more satisfactory. In order to make prints by this method it is necessary to use an optical printer for the picture, and a specially built sound printer for the sound track. This is necessary to get the track, and the emulsion on the right side. There is, however, a new sound printer on the market now which claims to have solved this problem. So much for 16mm sound which the amateur himself will make.

Every picture we see in the theatre is sound. Not all synchronized sound by any means, and a great many of them are made silent with the sound recorded later. Just as the theatre has added sound to all pictures the amateur is going to want to add sound to his silent films, and inci-

16mm Film

by

J. Lloyd Thompson

Laboratory Supervisor, The CALVIN CO.,
Authorized Agfa Ansco Reversal Laboratory

dentally he is probably going to find that it will be to his advantage to make a lot of his pictures silent, and add sound after they are all edited. It may be a ghost voice, music, or a mixture of the two. It is possible now to buy equipment to do this with, but most amateurs, and probably a lot of the industrial users are going to find it to their advantage to have a regular commercial laboratory do the work. There are several labs now doing this work, but since I am most familiar with our own work most of the discussion of this problem will be confined as to how we do it.

The picture is first made, and completely edited. It is usually made 24 frames per second although we have recorded sound on pictures made at 16 frames per second which projected very nicely without being noticeably fast. We then make a duplicate, and using the duplicate we project it in a sound projector and write the script, and decide on the music, and any sound effects we want to use. It is very essential that the script be timed correctly, and it is important to keep it rather short as too many words will cause the announcer to rush with the result that he will be hard to understand. These two points should

(Continued on Page 318)

Gadget for Making Wipes

by
Arthur Wolf

THE article written by Lynn Dunn, A.S.C., about a year ago on "Tricks of the Optical Printer" inspired me to experiment in order to find an easy way for an amateur with merely his camera to depend upon, to produce pictures with similar effects. I wanted it to be something small and inexpensive that could be attached to the camera. The result was the gadget shown on this page which was built at a total cost of 10c for the mirror.

This gadget is to be used for scenes, not for titles. You will understand the why of this as I explain the use of the gadget and what happens photographically when you photograph through the mirror.

This "Wipe" gadget is nothing but a small cardboard box, which has a right-angled triangular shape at top and bottom and three rectangular sides. See Fig. 1. And by the way Fig. 1 is reproduced in actual size.

One side is provided with a vertical opening, in which a mirror about 4" long x 1 1/2" high is inserted (Fig. 2). The box is fastened to the camera door with a strong rubber band slipped over the box and each loop over the view finder from both sides of the camera (Figs. 6 and 7). The mirror is then inserted and pushed forward until it touches the left front edge of the lens sunshade and reflects into the lens the scene that is to the right (45°) of the camera. While this scene is photographed, I pull the mirror back very slowly, obtaining a wipe-off and wipe-on with one exposure, as the lens will gradually pick up the front view while the side view, by the same operation, disappears.

The mirror view (side view) will appear right side left on the screen. That is why we say this cannot be used for

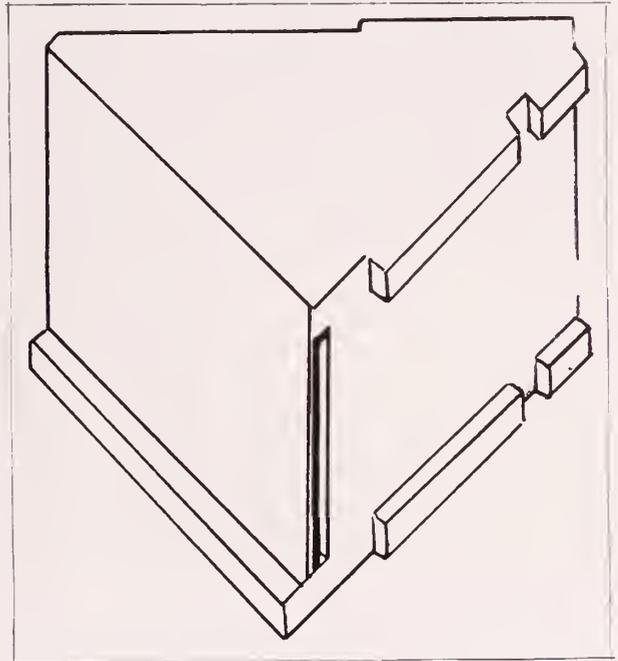


Fig. 1

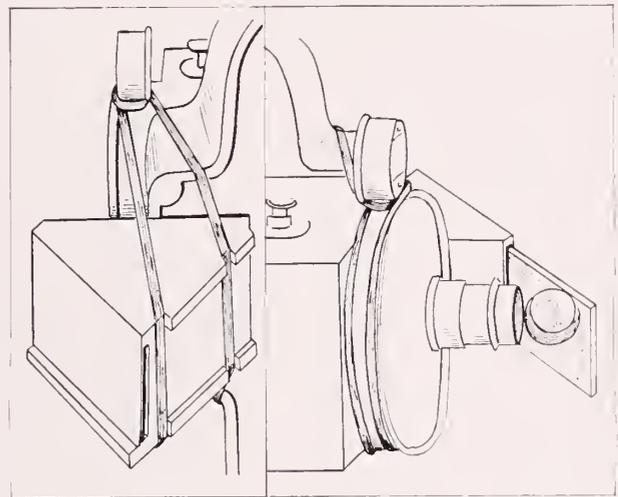


Fig. 6

Fig. 7

titles. It is a very fine effect for introducing characters. A number of persons can be filmed using this gadget without

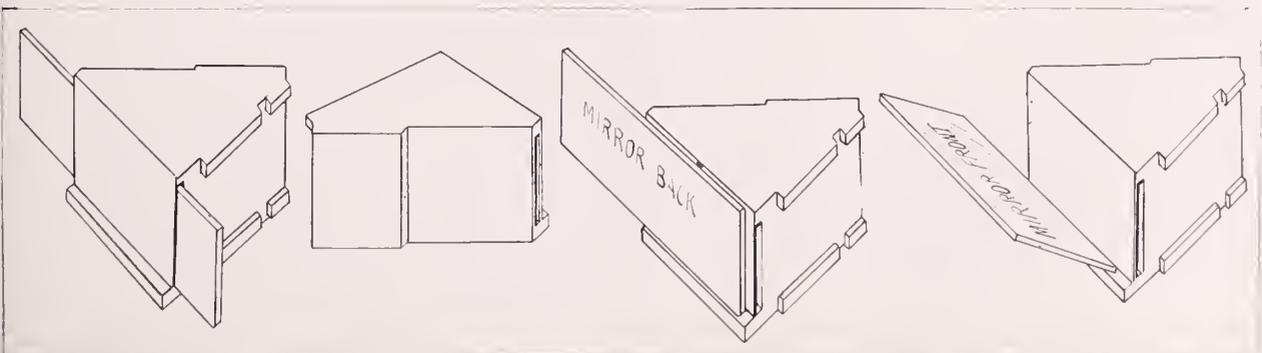
(Continued on Page 321)

Fig. 2

Fig. 3

Fig. 4

Fig. 5





Exposing at the Exposition

by
Walter Blanchard

IF YOU'RE going to the San Diego Exposition—and who isn't?—of course the family cinebox will be one of the party. But they're having a lot of exposition down there in San Diego—acres and acres of it—and unless you plan your filming, you're likely to run out of film before you're nearly ready to stagger (not run!) out of the exposition grounds. The picture-possibilities of the place are just about endless: if you have the time and the film, you'll find subjects about which you can create any number of individual picture-stories; and no matter what your favorite type of film-subject is, you'll find it at the fair. Where else could your lens rove from landscapes of stately beauty to nudists, more or less wild Indians, and Hollywood film-stars in less time than it takes to tell about it?

Seeing the exposition in itself is no one-day job; seeing it and filming it properly in a single session, still less. The logical thing, therefore, is to make two visits (that should please the fair-managers!), surveying the field and seeing the show the first time, and filming it the next. But if you can't do it that way, here is an outline for a pretty comprehensive exposition-film.

MAIN TITLE:

¡VAMOS AL FERIA!

(This can be very effective if double-exposed over a

shot of the bridge just within the west entrance, with the fair buildings in the background. The title could also be printed on a photograph of this view, avoiding double-exposure.)

Scene 1. Long-shot looking east on drive from west entrance.

Scene 2. Long-shot over side of bridge, panaming to view of the City.

Scene 3. Long-shot over north side of bridge: these two shots contrast the semi-tropical scenery of Scene 2 with the "Pacific-Northwest" landscape of this scene.

Scene 4. Medium lang-shot, looking east through first archway. (The reverse-angle on this arch is also very effective.)

Scene 5. Panorama of the exposition-grounds from the California Tower.

Scene 6. Long-shot looking south along the Plaza del Pacifico.

Scene 7. Long-shot of the huge pansy-bed in this Plaza; follow with closer shots *ad lib* of the flowers.

Scene 8. Long-shot of the great Spreckels Organ at the foot of the Plaza.

Scene 9. Panorama of the Plaza de America: this will include long-shots of many of the most unusual buildings in the fair: the Palace of Water, Palace of Electricity, Ford Building, etc., each of which deserves individual closer shots.

Scene 10. Closer shots of the Plaza de Aguas Cantates (in front of the Ford Building) and the famous singing fountain.

Scene 11. Mondays only: a sequence made inside the Motion Picture Hall of Fame, showing the making of actual matian pictures. On Mondays, special preference is given amateur filmers, the visiting stars cooperating generously, and you have every opportunity of making movies in a real studia.

Scene 12. Lang-shot, looking east along the Avenida de las Palacios from the Plaza del Pacifico.

Scene 13. Close-shot of the entrance to "Gold Gulch."

Scene 14. Closer shots *ad lib* in "Gold Gulch": this affers excellent material, for it is a 22-acre reproduction of a mining-town of the days of '49.

Scene 15. Long-shot of the "Nudist Comp" from the vantage-point in "Gald Gulch." Let your conscience be your guide as to making a complete sequence among the nudists. Cameras, we understand, are not welcome there, however.

Scene 16. Long-shot in the Spanish Village, which is north of Gold Gulch, across the Avenida de los Palacios. An excellent sequence in color can be made here.

Scene 17. Telephoto sequence in the bull-fight arena. You can get every feature of a genuine Spanish bull-fight here—except the blood and the horses, plus some very amusing action. Don't overlook the band.

Scene 18. A short sequence of the "Days of Saladin" will be another interesting bit of color, if you wish it.

Scene 19. Close shots in the Midget Village.

Scene 20. A "candid camero" sequence in the Zocalo, or Midway. Close angle-shots of the barkers and their exhibits—"Crime Doesn't Pay," "Hum-a-Tune," etc.; candid telephoto shots of the crowds, and so on, will make a very amusing sequence. This is a point at which to try montage, or rhythmic cutting for fast tempo.

(Continued on Page 318)

Tiny Footsteps Thru the Day

by
George Andrews



THIS script deals with the everyday footsteps of your baby. It shows what mother has to do every day in her life to guide those tiny feet in the right direction. The time is any day in the week. The place is your home. The characters are mother and the heir apparent: your baby. This story will prove invaluable to you as the years fly past and those tiny feet grow from a size 3 to 9. In this story, nothing is photographed except the lower half of the baby's body. Only in the last scene is this rule broken. The continuity will designate when to take the full figure of the baby.

Scene 1. CLOSEUP of baby's feet dancing impatiently. He is standing in the crib. Mother approaches, and lifts the baby from the crib. Little sleeper feet toddle off beside Mother.

Scene 2. CLOSEUP of little feet stopping beside high-chair. Feet are lifted out of scene by Mother.

Scene 3. CLOSEUP of little feet swinging back and forth in the high-chair. Occasionally a piece of food is seen dropping past the camera to the floor.

Scene 4. CLOSEUP. Little feet are lifted out of high-chair and placed on the floor, then toddle out of scene beside Mother's feet.

Scene 5. CLOSEUP of the sleepers dropping on the floor. Little feet are lifted out of them. Feet are lifted up and set on Mother's knee.

Scene 6. CLOSEUP. Tiny panties are seen, being slipped on over the feet, then socks and shoes, and the baby is again set on the floor. The tiny feet toddle away, this time without Mother.

Scene 7. CLOSEUP of little feet stopping beside the screen door. The door is seen being pushed open by baby.

Scene 8. CLOSEUP of Mother's feet. They turn and walk quickly out of scene.

Scene 9. CLOSEUP of baby's feet, Mother's feet come into the scene and the two pair of feet walk out of the door together.

Scene 10. CLOSEUP. Shot of play pen. Mother and baby's feet come into the scene. They stop before play pen. Baby's feet are lifted out of scene, then reappear on the inside of the play pen. Mother's feet turn and walk out of the scene.

Scene 11. CLOSEUP of toys being thrown out of the pen. Little feet stamp up and down angrily.

Scene 12. CLOSEUP of Mother's feet as they walk out of scene.

Scene 13. CLOSEUP of baby's feet standing in a puddle on the play pen floor. Mother's feet come into scene. Her hand reaches down and feels the baby's panties. They are wet. Mother gives the baby a light tap on the legs. Baby is lifted out of the pen and put down on the other side. They walk out of scene together.

Scene 14. CLOSEUP of a little potty chair. Mother and baby's feet come into the scene, and baby is seated on the potty chair. Mother's feet turn and leave the scene.

Scene 15. CLOSEUP of baby's feet kicking angrily against the potty chair. Mother's feet come into the scene, and clean panties are seen being slipped over the baby's feet. The two pairs of feet leave the scene together.

Scene 16. SAME AS SCENE TWO, EXCEPT THAT THE BABY'S FEET ARE NOT IN SLIPPERS.

Scene 17. SAME AS SCENE THREE.

Scene 18. CLOSEUP, SAME AS SCENE FOUR, except that little feet toddle away alone.

Scene 19. CLOSEUP of the base of an ash tray stand. Little feet walk into scene and stop before ash stand. The ash tray is thrown to the floor. The glass tray breaks, cigarette stubs and ashes are strewn over the floor.

Scene 20. CLOSEUP of Mother's feet. They turn from the sink where they are standing, and hurry out of the scene.

Scene 21. CLOSEUP of baby's feet. The baby's hand reaches down to pick up one of the stubs. Mother's hand comes into the scene and slaps the baby's hand. Mother's hands are shown picking up the pieces of glass, as the baby toddles away.

Scene 22. CLOSEUP of baby's feet coming into the kitchen. He stands before a chair, and pushes it to a cupboard. Baby's feet climb upon chair, then stand on tip-toe. Cookie crumbs are seen dropping around the baby's feet onto the chair, then cookie can drops to the floor with a crash.

(Continued on Page 322)



Learn About Shooting Color from "Becky Sharp"

by
Karl Hale

THE first full length feature made in Technicolor was naturally watched with a great deal of interest by the entire motion picture industry. This was perhaps mostly to determine the trend of color in future pictures.

Technically there is a great deal to learn from "Becky Sharp," this first full-length color picture made by Pioneer Pictures and released by R.K.O. It is evident that the art directors and color directors of that picture discovered early in the making of the production that it was very dangerous to the story value to inject any of the primary colors.

The picture being laid in the time of Napoleon and the scene being England it is only natural that soldiers with the red coats of that time will be a part of the cast.

Up until the entry of the first red coat there is something very pleasant, almost soothingly surprising in the colors. They are in pastels and greys. The first entry of a red coat pulls your eye to that coat and it adheres to it.

Another illustration of the power of red in a picture is one scene where Becky Sharp and one of the men are sitting in the foreground. Back of them is a vase with red roses. Your eye is constantly pulled away from the people to the flowers.

There is another scene where they have dressed Becky in blue close to primary, or so it seemed. In this scene she is with one of the soldiers in a red coat. The interests are constantly clashing. Your eyes are pulled from one character to the other depending upon movement.

The amateur is prone to look for reds and blues and primary colors when shooting the new Kodachrome or Dufay color. Try one roll away from those heavy colors. Go more into the lighter shades into the pastels and see how pleasing your color pictures will be. If you go for your outstanding primary colors you will have nothing but color to look at and the rest of the picture will not mean anything. Right now many are picturing just those types of subjects, but as time goes on and you tire of just looking at color and will want your color pictures to mean something you will realize that you were merely proving to yourself that the manufacturer was right when he said his film would photograph color.

In the 1934 Amateur Contest the film which won the Kodacolor prize contained all the softer shades of colors. Especially the outdoor scenes had the soft fall colors of the fading plant life, the ripening grain, etc. The people were not dressed in the harsh bright colors, but in the colors they naturally wear.

It would seem from some of the reports reaching us that it is safer in shooting color to lean a little toward over-exposure, more than under-exposure. It is the claim that under-exposure darkens the scene, bringing the reds and blues into more prominence.

Too much color will tire one very quickly. We had occasion to look at many demonstration reels. The longer those reels were the more boring they became. This was not due to any fault of the color itself, or to the way in which the film reproduced that color, but because there was too much color, too many brilliant colors, there was too much clashing of eye interest.

What you learned about composition in black and white will not mean much in color filming if you do not watch the placement of your colors. Color itself can throw your composition all awry. It will make its own composition in spite of you.

It seems as though it would be best to lead up into the heavier colors slowly. Attempt the softer shades, learn the value of color and especially the placement values otherwise you are merely going to have a hodge podge of color without any central interest.

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WHEELS OF INDUSTRY

Leica Dufay Color

● In their announcement of Dufay Film, the E. Leitz Co. stated there were 300 natural color exposures. This should have read 30. Merely a typographical error of 270 colors.

Mogull Catalog

● Mogull Bros. announces a new catalog of substandard film releases. It is the 5th edition of this work, which will be sent free upon request to Mogull Bros.

Accessory Co. Moves

● Motion Picture Screen & Accessories Co., formerly of 49 West 24th St., New York City, have moved to 520 West 26th St. This company manufactures and markets the Britelite Truision Portable Projection Screen.

New B. & H. Sound Projector

● Bell & Howell Company announces a 1000-watt 16mm sound-on-film talking motion picture projector for use especially in large auditoriums with audience capacities of 2000 and more persons.

The picture-projecting component of the new Filmosound is, fundamentally, the silent 1000-watt Filmo auditorium projector, which shows most effective pictures up to 16 feet in width. It was one of these 1000-watt silent 16mm machines that was used recently for presenting the motion picture accompaniment of a lecture given under the auspices of the National Geographic Society in Constitution Hall, Washington, D. C., which auditorium seats 4000 people. In this particular case, the picture size was increased to 22 feet.

Because of the size of the auditoriums in which the new sound picture projector is to be used, a separate-unit high-fidelity amplifier of high-power output is employed. This will fill any average-sized theatre or auditorium.

Bearing witness to the superlative character of the new machine is the fact that provision is made for the operation of two film projectors, with the necessary changeover controls. Changeover is made in the sound and picture simultaneously, by a single control. A control is provided for the correction of high and low line voltages, and the indication of the correct setting is observed on a special voltmeter.

There has been provided a sound volume control, a microphone volume control, a tone control, and a microphone jack. The regular Bell & Howell arrangement of "AC-DC" operation has been retained and all plugs and receptacles have been so arranged that only correct connection is possible. All tubes and cables are mechanically and electrically shielded and consequently are protected from damage and from electrostatic disturbances.

The entire 1000-watt outfit is housed in two carrying cases, one weighing approximately 55 pounds and the second approximately 105 pounds.

Bee Bee Distance Meter

● Burleigh Brooks announces a new distance meter under the brand name of Bee Bee for use with both still and motion pictures. It has a long optical base of approximately 4 inches which it is claimed insures twice the accuracy of one half so long. The medium which actuates the meter consists of semi-transparent gilded dividing mirrors which produce 2 images of the subject in the optical field. As one glances through the eyepiece, if the meter is not in focus, one sees two images of the subject, one sharply defined, the other a bit vague—within a luminous circle. This is brought about by the fact that the light from the subjects is refracted or split. As the dial is rotated the 2 separate images of your subject are superimposed. When the point of exact coincidence is reached, the distance is read off on the dial. The mirrors form an integral part of the mechanism, can be cleaned as they are not surface frosted and being firmly imbedded in metal will not get out of adjustment.

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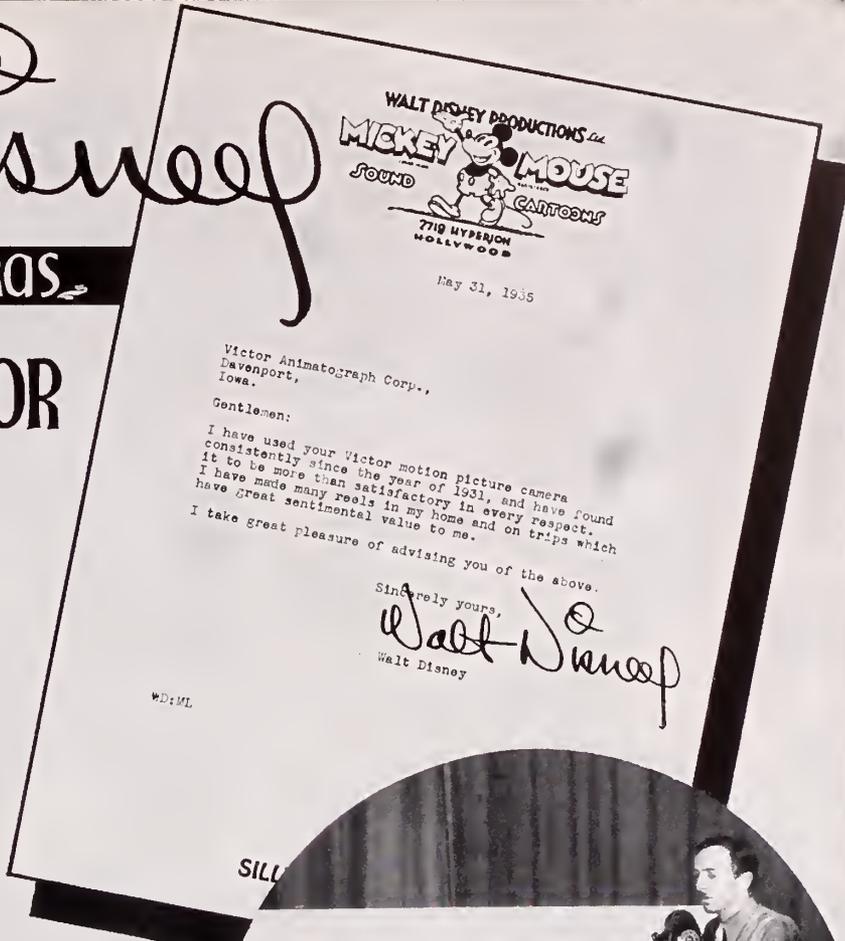
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HOME REVERSAL DEVELOPMENT

(Continued from Page 307)

pletion — as far as they will go — so judging when to stop is reduced to being sure to get enough. Spotty or uneven positives usually mean that all the acid has not been removed from the emulsion (too short a time in the clearing bath and wash water) or uneven flashing exposure not wiped out by bringing a lamp up close to the film during the second development.

PRINTING METHOD

This method has the big advantage that it requires only the same camera exposure as for regular panchromatic reversal film except in light deficient in blue—then a slight increase in exposure is needed to make up for the lack of color sensitivity of positive stock. However, for best results, the exposures of the various scenes must be more nearly uniform, so a good exposure meter should be used if one can possibly be obtained.

In the printing method of reversing, only a normal negative image is desired, hence the camera exposure can be much less than in the former method. With the developer mentioned before and ex-

posure the same as regular panchromatic reversal, two minutes is about the right development time at 65 degrees. The film is then put into an acid stop bath of:

Water.....1 quart
28% Acetic Acid 1 oz.

In warm weather it is well to add one ounce of Potassium Chrome Alum as a hardener to the above bath. After three or four minutes in this stop bath, it can be replaced with clear water for a rinse.

While the film is revolving in the rinse water, it is flashed by turning on the flashing lights; in fact, the negative is actually printed on to the same film. The denser the negative, the longer the flashing exposure will have to be, just as when printing from a negative on to another film. This time will have to be determined experimentally by each worker for his own setup of lights but the author's setup and data will serve as a guide. With a drum 14 inches long and 13 inches in diameter as shown in the illustration, holding 60 feet of film, the author uses two photoflood lamps with their centers 18 inches from the face of the drum. With normal camera exposure

and the suggested two-minute first development, a flash of 4½ minutes is about right. It is necessary that all flashing light must pass through the negative image, so only a solid drum can be used in this method of reversing. The flashing is done while the film is being washed; if done without water in the tank the film will partially dry in places and print unevenly.

After flashing, the film goes through the same bleach and clearing operations as used in the previous method only it must be done under a red light instead of white as before. Careful clearing and washing of at least ten minutes are also required before the film goes back into the same developer for the second development. The positive image will develop up now very similar to that of a print from a negative and its development time should be judged accordingly. With the exposure and development data given here, the second development should take about three minutes, after which the film is fixed in an ordinary acid hypo bath until the remaining silver bromide is dissolved. The film is then washed and dried as explained under the total flash method.

Since in the printing method you are actually printing from the negative before destroying it, the resulting positive



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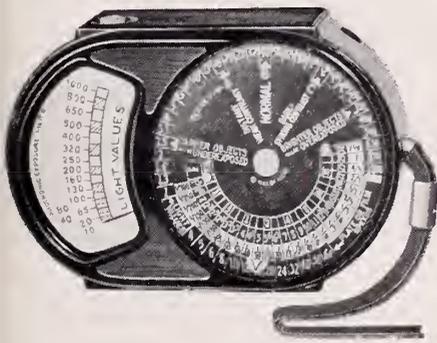
Perhaps you will be interested to know that a Weston Exposure Meter was used constantly during the taking of the candid color pictures reproduced in the May issue of Fortune. Owing to the fact that the film employed for this work is processed by direct reversal, which reduces the range of permissible error in exposure within very narrow latitudes, it is essential that accurate exposure data be available and made use of. It was only after wasting several rolls of film and much time that I acknowledged the fallibility of my own judgment in the matter of correct exposure and turned to the Weston Meter for help.

The uniformly satisfactory results which followed upon the use of the meter were such that I will never again attempt to take colored pictures without one.

Very truly yours,

(signed) *Charles F. Jacobs, Jr.*

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will be more contrasty than that of the total flash method. Many amateurs will like the snappy black and white positive they get this way, but those who want softer results can try a softer developer for the negative development—D 76 should work nicely. Uneven exposure between the different scenes will be more noticeable in this printing type of reversing—the total flash method seems to smooth out the different densities—for this reason accurate camera exposure can not be urged too strongly.

The formulæ given in this article are not the only ones that will work—there are plenty of other good ones too that

can be used after the amateur understands thoroughly what he is trying to do. However, the ones given are all of good keeping quality and may be bottled and used repeatedly until exhausted, although it isn't advisable to risk a good film on chemicals that have been used too often. The developer given is also good for titles and prints from negatives—also on some papers for still pictures.

It is hoped that the foregoing instructions will enable many amateurs to gain further enjoyment out of their cameras as there is nothing like the satisfaction gotten in doing all of the photographic work on your pictures.

Documentary Picture of the Old Farm

(Continued from Page 305)

scenes of feeding the chickens and let the youngsters of the farm take a hand in feeding the baby chicks. A closeup of the slop pail being stirred leads to other scenes at the pig pen. Get a shot of the hired man mucking through the mud in the pig pen and by all means a scene of the little pigs fighting for a place at the feeding trough. A comedy shot of an old hog scratching himself will always bring a laugh. One of the older children can hold a bucket of milk for the calf to good picture effect. If you can find a birdnest in the tree and get a shot of the mother feeding the babes, that will make a hit. A closeup of Dad as he says "grace" at the table and some few closeups of hands serving bountiful plates will tell the story from the family point of view.

To reach the very soul of simple country folk, search for a picturesque country church. Make an artistic general view of the church with effective framing and lighting. When the bell rings, you will usually find one of the congregation manipulating three or more ropes with his hands and feet. Study the action and select convincing angles of his feet, his hands moving up and down across his face, the bells turning in the tower, then create a scene of unusual charm with this material to work with. Frame a church-like door in the foreground and have some of the village folk coming up the path in the background, as seen through the door. And all during this scene, show the bell-ringer's arm pulling the rope in the near foreground.

An experiment in indoor photography is next in order. Four one-thousand-watt lamps with convenient reflectors will illuminate enough of a small village church to tell the story. A scene of taking up the collection gives the opportunity for some action and a chance to work in closeups of the congregation as they give their mites, and the minister as he receives and blesses it. In using the lights, work for effects. Use two lights on one side of your subject, one on the

other and try to spot one for backlighting. For the scenes of the minister at the altar, create a beam of light as if coming in through a window and illuminate him principally from one side. End this sequence with some symbolic scenes such as a full view of a big Bible as the minister's hands close it, a stained glass window, a candle burning or a crucifix or shrine lighted only with a beam.

To carry on the tempo of this subject, and yet to enable you to break away from the church sequence without abruptness, some artistic scenes of the countryside, trees, flowers, brook and clouds will fit in nicely. Extend this sequence with some shots of men working in the fields, loading hay, shocking corn or such, and concentrate every effort towards lifting these scenes from everyday category by creating artistic effects with lights and shadows, heavily filtered skies, silhouettes and cloud effects.

Exposing at the Exposition

(Continued from Page 310)

Scene 21. Telephoto sequence made in the "Globe Theatre," where Shakespearean plays are given in an unroofed auditorium, just as they were presented in the time of Shakespeare.

Scene 22. Closeup of a bugler in the "U.S. Army Camp."

Scene 23. Ad lib scenes showing activities in the camp.

Scene 24. Medium long-shot, entrance to the Indian Village.

Scene 25. Long-shot of the Indian Village.

Scene 26. Closer shots ad lib of the Indians. Twenty-six tribes will be represented, offering innumerable picture-possibilities in studies of their living arrangements, handiwork, etc.

Scene 27. Long-shot from the California Tower, as the sun drops into the Pacific. FADE OUT.

THE END.

This outline, of course, barely touches upon the picture-possibilities of the fair. Almost every scene indicated here can

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Hollywood, Calif.

be expanded into a complete production if you have the time and the film available. "Gold Gulch," the Spanish Village, the bull-fights, the Indian Village, and others, each offer sufficient material for a full 400-foot picture. The Midway and its people would make a fascinating candid-camera reel. The beauty of the various Palaces and buildings could be combined into a hauntingly beautiful pictorial reel.

In addition, the variations possible with this suggested framework can suit almost any filmic need. The picture can be a straightforward documentary film of the fair itself, or it can be humanized with shots of your own party moving through the grounds and examining the exhibits.

Almost the entire fair can be filmed to better advantage in color, if you feel in so expansive a mood. Moreover, if you have fast lenses, the spectacular floodlighting played upon the buildings and fountains by night (a total of 4,000,000,000 candlepower is said to be used throughout the fair!) will make a striking closing-sequence for your film.

The Motion Picture Hall of Fame is virtually the only building within which you will find sufficient illumination for photography; the others, while housing exhibits of great interest, are usually either too softly lighted or too crowded to permit even stop-motion camerawork.

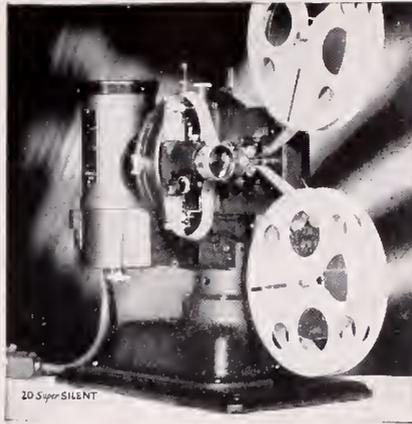
If you are interested in filming wildlife, an additional sequence (or picture) can be made in the Zoo, which is one of the finest in the world. In this zoo, the animals are apparently unconfined: you will not, in most cases, have to worry about shooting through bars and nets. Instead, you can film lions and tigers—apparently in their natural surroundings—in perfect safety, and (if you are patient) you can get scenes rivalling those of a Martin Johnson.

Putting Sound on Silent 16mm Film

(Continued from Page 308)

be kept well in mind when writing the script which the laboratory will use.

The duplicate film is then taken and projected in a projector which is synchronized with the sound recorder, and the announcer follows the pictures as he reads the script. Naturally it is practiced several times before it is recorded. The actual recording is then made on a special 16mm sound film which is then reversed. This method is used because it cuts down background noise which is a problem in small film, and also gives the finest possible grain which becomes very important and when trying to record high frequencies on 16mm. The original picture is then printed on a special reversal duplicating film made for us by Agfa Ansco in a special optical printer. The sound track is then printed



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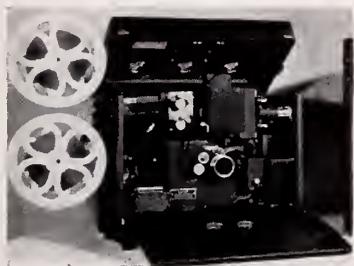
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on this same film on another printer and the whole is processed by the reversal method. This method gives you the final picture through only one duplicating process. It allows the laboratory to make correction in either the original picture, or the sound track so that the best results are obtained. It gives a sound track with a high percentage of the high frequencies retained, and a freedom from background noise. The optical printer gives a picture hard to tell from an original.

By recording direct on 16mm and making duplicates by the reversal method it is now possible to get sound on film at a much lower cost than ever before possible. By eliminating the duplicate negative step it is also possible to produce quality which is comparable to reduced 35mm film. In fact several professionals who have seen and heard these direct 16mm sound prints have sworn that they were reduced 35mm.

In direct 16mm the utmost care is used, every step is closely watched, and as many steps as possible are eliminated. When these rules are followed 16mm direct sound on film is very practical, and should become more so. By this 16mm process a great many more people will be able to use sound pictures. The cost of adding sound to 16mm films is lower than ever before thought possible.

There is a very distinct use for 16mm in industrial films. There are a number of photographic dealers who have 16mm customers who make excellent movies, but they are sort of lifeless and useless for industrial use since sound entered into motion pictures. Heretofore the only way to get sound on these pictures was to have it made on 35mm and then reduced to 16. This gave good sound, but it was necessary to make the picture by a dupe negative, and the cost of all this work naturally ran the cost up considerably, and any organization that could afford all of this could probably afford to have some industrial producer make the entire film. By direct 16mm sound the user of films with a limited budget can even make his own pictures, and then have the sound added, thus giving his pictures a punch impossible to obtain in any silent picture.

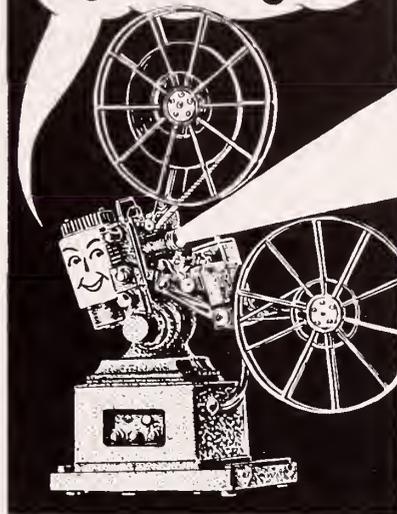
Gadget for Making Wipes

(Continued from Page 309)

stopping the camera. When the people at the side are filmed they can step from the scene while you are photographing those in front and can be replaced by new characters who will be filmed when you push the mirror back over the lens again. This can be kept up indefinitely depending upon how long the camera will run with one winding.

With this same gadget I have solved the problem of how to obtain a "turn-over" effect.

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Instead of inserting the mirror into the slit, I hold it against the back of the box (Fig. 4) and photograph this way through the mirror, which is then tilted backward to get the front scene in view of the lens (Fig. 5). The mirror could also be turned sideways like a door.

The box is made out of two layers of cardboard, between these cardboard is a thin sheet of tin cut the same size with a pair of scissors. It is then pasted together and covered with thin black paper.

Tiny Footsteps Thru the Day

(Continued from Page 311)

Scene 23. CLOSEUP of Mother's feet entering the scene. Mother gives the baby another light sleep, and lifts him from the chair.

Scene 24. CLOSEUP of baby toddling hurriedly out of scene.

Scene 25. CLOSEUP of front door. Father's feet enter the door and stand. Baby's feet enter the scene, and are lifted up by Father. Camera follows baby's feet on a tilt, as Father tosses baby up into the air. Father sets the baby on the floor, and the two pair of feet walk out of scene together.

Scene 26. CLOSEUP of Father's and baby's feet stopping before a chair. Father sits down. He lifts the baby up and bounces it on his knee. Suddenly he stops bouncing, rises from the chair, and holds the baby at arms length. His trousers are very wet. Mother's feet come into the scene. Her hand again feels the baby's panties.

Scene 27. SAME AS SCENE FOURTEEN.

Scene 28. SAME AS SCENE FIFTEEN.

Scene 29. SAME AS SCENE SIXTEEN.

Scene 30. SAME AS SCENE SEVENTEEN.

Scene 31. CLOSEUP of Father trying to undress the baby. He has great difficulty in getting the panties off. He then begins to endeavor to untie the shoes. The laces become knotted. Father's fingers are seen fumbling frantically to untie the knots. The baby is squirming, therefore making it more difficult for Father. One of Father's hands leaves the scene, and re-enters holding a pocket knife. He is about to cut the shoe laces, and Mother's feet hurry into the scene. She takes the pocket knife away from Father, then takes the baby.

Scene 32. CLOSEUP of Mother sitting down in a chair with the baby on her lap. She removes the shoes with perfect ease.

Scene 33. CLOSEUP of baby's feet being put into both-tub.

Scene 34. CLOSEUP of sleepers be-

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ing put on the baby. Mother picks up baby and places it in the crib.

Scene 35. MED. SHOT of the baby, asleep with an angelic expression on its face. Mother bends down and looks down at baby for a minute, a loving

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smile on her face. Scene fades as Mother kisses the baby goodnight.

Scene 36. TITLE . . . And so the sands of time erose his tiny footsteps from another day . . .

THE END

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If your camera is running 8 times normal how long will it take to expose 400 feet of film?

If your camera is running 4 times normal how many feet of film will you expose in 55 seconds?

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If F 11.3 would be the right stop with the shutter set at 170 degrees, what would be the lens opening with the shutter at 40 degrees?

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What is the fastest lens for 35mm cameras and who makes it?

How far from the camera would your subject have to be for a head close-up with a 100mm lens?

With a shooting light of F 6.3 and the camera shutter at 170 degrees, what would be the F value of the Akeley Camera with 280-degree shutter?

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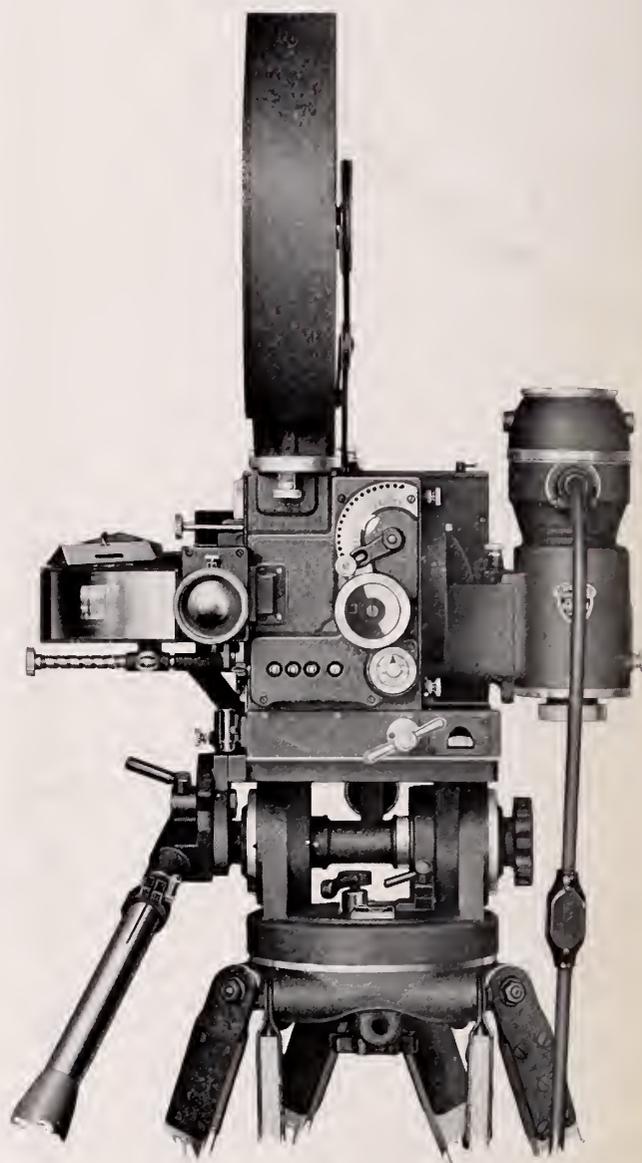
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October,
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Volume 16 OCTOBER 1935 Number 10

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- More about lighting, but this time about the use of arc lights in black and white photography as it was employed in one of the big coming productions. An A.S.C. man will give you the insides of this interesting story.



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†Malkames, Don
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Polito, Sol

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Cortez, Stanley

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Finger, John
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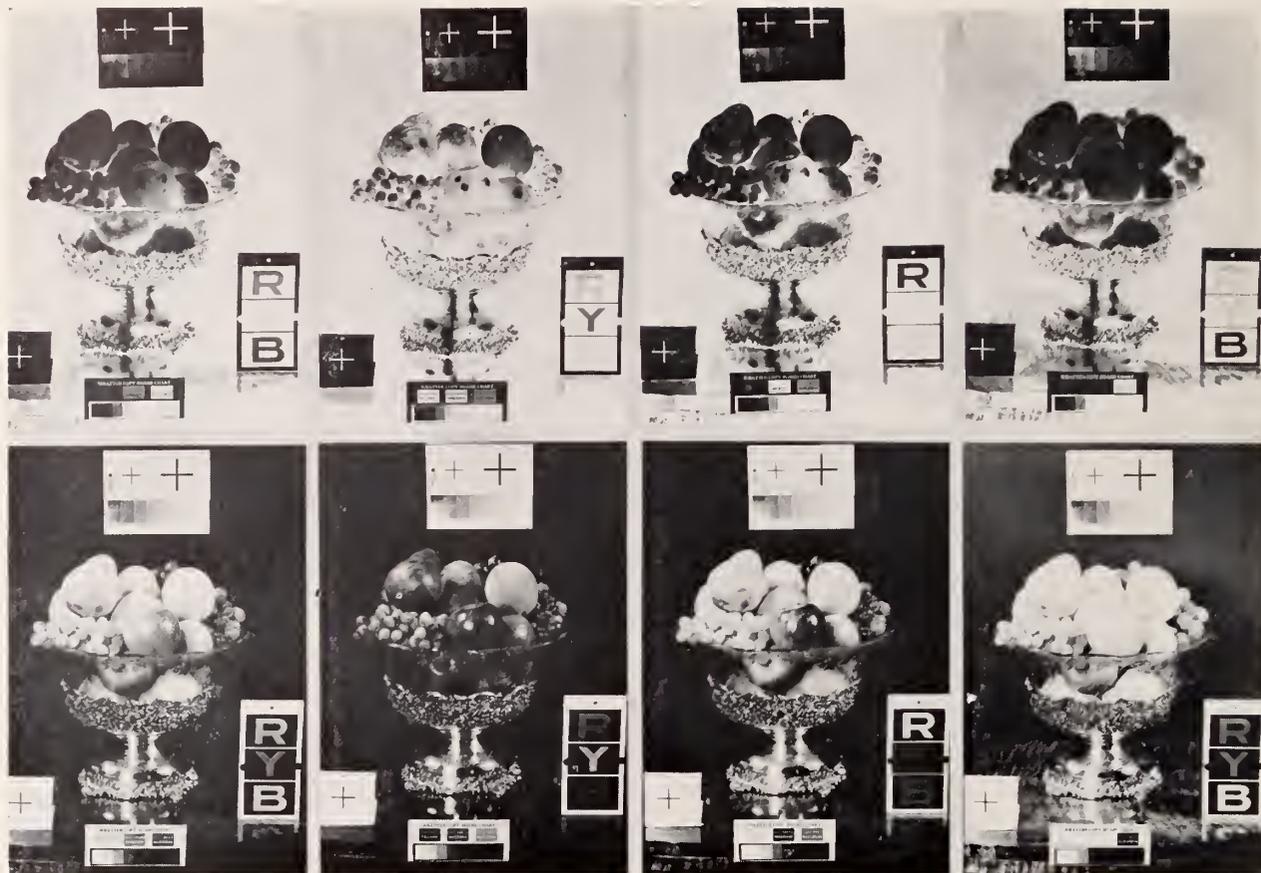
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Color-separation negatives and prints. Reading from left: normal black-and-white rendering (K-3 correction); yellow printer, made with blue filter; red printer, made with green filter; blue printer, made with red filter. In color guide at lower right of picture, "R" is green, "Y" is violet, and "B" is red.

"Still" Photography in Natural Colors

COLOR photography has definitely assumed a most important place in the commercial fields of advertising and illustrating, even to the extent of crowding paintings, drawings and black-and-white photographs in the pages of our national magazines. It is making worthwhile strides in motion picture production, and indeed has reached a fine state of development in certain recent releases.

With an increasing number of all-color features scheduled for production during the coming season, the question naturally arises, "Since natural-color photography is so successfully used in our magazines, can it not also be used to give us natural-color stills for our Technicolor releases?"

The best answer to this question is a careful review of the principal methods of natural-color photography in general use today, and their adaptability to the problems of the studio still man. But before starting on such a review, it behooves us to have at least a rudimentary knowledge of the principles underlying these processes. Therefore, at the risk of repeating facts with which the reader may already be familiar, I shall give a brief description of color in its physical aspect, as light.

When sunlight is passed through a glass prism, it becomes decomposed into a series of separate colors known

by
Philip M. Chancellor, A.S.C., F.R.G.S.

as "Spectrum Colors." Actually, spectral colors are innumerable, and range from the (invisible) Infra-reds through all the visible shades to the invisible Ultra-violets. By means of a slit, the solar spectrum may be divided into a series of distinct lines of color, known as the Fraunhofer lines. The most distinct of these lines are designated by letters, and serve as a means of identifying the position of certain colors in the spectrum.

Figure 1 shows the position of the most important lines in relation to the spectral colors, while the numbered lines indicate their wave-lengths in terms of Angstrom Units.

If by optical means the independent colors of the spectrum are superimposed upon each other, the result will be white light. Thus we may conclude that white light is the combination of all the colors in the visible spectrum, and hence it is termed Polychromatic light. In contradistinction to polychromatic light, we find that by superimposing only selected parts of the spectral light, colored light-

mixtures of a uniform tint may be obtained, and this is termed Monochromatic light. Thus we differentiate between light of one selected wave-length, and light of mixed wave-length. By suitable choice of two spectral colors only, white light may be re-composed. Such spectral colors are called Complementary. Such complementary color-combinations are:

- Red and Blue-green.
- Orange and Greenish-blue.
- Yellow and Blue.
- Greenish-yellow and Violet.

To appreciate the sensation of color as produced upon the human eye, we must regard the Young-Helmholtz theory of color vision. This theory, originally advanced by Young in 1807, was later accepted by Helmholtz and Maxwell, and is still favored by the majority of physicists.

This theory assumes the presence of three light-sensitive nerve-fibrils in the human eye, which serve as a means of transmitting to the brain the three primary color-sensations. When excited, one conveys to the brain the color-sensation of red, the second, that of green, and the third, that of violet. If all three fibrils are excited simultaneously and with equal intensity, they convey the sensation of white. When at rest, they convey the sensation of black. Unequal excitement conveys intermediate tones of color, in proportion to the amount of primary color-vibration.

Young selected for his original experiments the fundamental colors of red, green and violet. Later experiments, however, have shown that it would be impossible to mix all the spectral colors in scientifically full purity, using only the three primaries; but for practical purposes, the three primaries are sufficient, as the average eye cannot judge color with sufficient accuracy to detect these more minute inaccuracies of shading.

Bearing in mind the foregoing principles, we now face the practical application of our knowledge. This we may divide into two sections: First, the analysis of the colors, and their separation through the use of filters—that is, making the negative or negatives; Second, the resynthesis of the colors to form a colored photograph—that is, making the positives or prints.

The problem of the separation of the colors may be considered as solved; the color-sensitivity of modern photographic emulsions and the color-absorption of filters gives the photographer almost perfect control of this phase, though mechanical and optical factors render the matter of camera design and manipulation complicated and expensive.

The second—and by far the greatest—problem lies in making the positive print. Even in magazine-printing, the problem of producing a printing plate or plates, and the exact mixing of inks to restore color to the image, is far from its ideal solution in spite of the great progress that has lately been made. Producing our color-picture on paper, without recourse to photoengraving and mechanical printing, as will be necessary in studio work, is an even greater problem. While color-prints, made photographically upon paper, are not impossible, their production as yet is a slow, intricate and expensive process in no way comparable with commercial black-and-white printing methods.

The reasons for this are obvious when we review the steps involved in producing a photograph in natural colors. In the first place, we must break down the image into its three complementary-color components. Disregarding the screen-plate processes, which produce airy transparencies, the most practical means of doing this is by making a set of three complementary negatives. The densities of the three negatives represent the amount of Red, Green and Blue light reflected from the object photographed. This much is relatively easy, due to the control possible by using

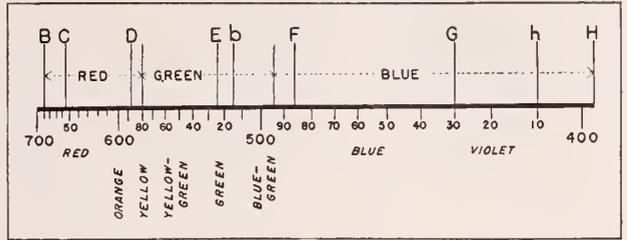


Fig. 1

color-filters of the proper absorption characteristics. Transparencies made from these three negatives, each illuminated by light of the appropriate primary color, should when superimposed, give a picture of the object in its original colors. This at least is the happy theoretical assumption; in practice, unforeseen difficulties are encountered. Theoretically, the projection filters should be the same as the taking filters; when superimposed equally, the colored beams projected through these filters should form white. Actually, this ideal condition is not fulfilled by the taking filters, so in practice another set of filters must be used for projection to recreate the colors of the original.

Actually making our three color-separation negatives, we begin with three panchromatic plates or films, and expose them through the Wratten set of tri-color filters. These filters, the "A" No. 25 (red), "B" No. 58 (green) and "C-5" (blue-violet), are characterized by even transmission, and end as abruptly as possible. The blue-violet and green overlap from wave-length 480 to 520, and the green and red from 580 to 600. Since their respective factors are different (respectively 4, 8, and 6 an Super-Sensitive in daylight), the three exposures must be compensated so as to produce an overall correct exposure.

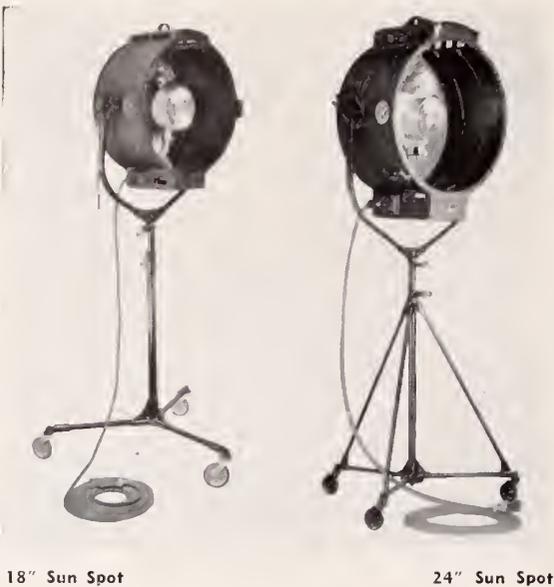
Considering, for the sake of simplicity, only one of the three separation-negatives, we can easily see that, for example, the red-sensation negative will record the amount of red in the subject in terms of greater or lesser density according to the proportion of red reflected from any given area. A positive plate made from this negative will represent purest red by means of its clearest portion—that is to say, where the red has been most freely transmitted by the filter—and those parts containing less red by an increase of density in the plate. Where no red exists, the plate will be opaque. If the plate is held before a red light, it would reproduce the red-component sensation in the original. In the same way, the other two plates will react similarly, and reproduce their respective color-sensations.

Were these three plates placed in a suitable viewing instrument, together with their respective filters, and viewed (by projection or otherwise) accurately superimposed, the original image, in all its colors, would be reconstructed. In this instance, it will be noticed that "colored light is added to colored light." By superimposition of light tinted by the primary filters, an image is produced. This is known as the ADDITIVE process.

To recombine these colors on paper, as in a photographic or mechanical printing process, it becomes necessary to superimpose the colors upon each other on paper. The white paper upon which we place the three images will reflect all three primary colors. Now, contrary to the Additive method of superimposition just outlined, we must in this case print from the thinner parts of the plate, or those parts which represent an absence of color in the separation-image.

Therefore, our Red must not be printed in red ink, but rather with a "Minus-red" ink, or a color which completely absorbs red. In addition, the color to be represented

Summing Up



18" Sun Spot

24" Sun Spot



Lupe Light

is the recently introduced Mole-Richardson "Junior Solarspot", which appears almost dwarfed in comparison with the 18-inch Sunspot which it is rapidly supplanting. And not only do modern units utilize a greater percentage of the light radiated by their light-sources, but they distribute it more uniformly within the projected beam, so that subsidiary lamps are no longer needed to minimize the effects of uneven beam-distribution.

In general, the incandescent-filament globe is still by a considerable margin the most popular light-source; but the carbon arc, in its modern forms, is regaining more and more of the ground lost during the almost simultaneous introduction of Panchromatic film and talking pictures. In the field of natural-color cinematography, of course, the arc is supreme due to its more perfect approximation of the color of natural sunlight, and to its higher unit intensity.

It is customary to divide lighting equipment into the two broad groups of "general" and "modelling" lighting units; but it would seem more accurate to re-classify them today as "floodlighting" and "spotlighting" (or "projecting") units, and to add a third category to include the various special-purpose lamps developed in recent years.

Under the head of "floodlighting" equipment, we may list those units used to provide a uniform light-flux, of moderate intensity, over a wide angle, and used either on the stage floor or overhead. In the incandescent range, these units are represented principally by the "Rifle" lamp, which has almost completely superseded the early incandescent broadside, and by the obsolescent five-globe "bank" and overhead strip units. In the arc range, we find the modernized twin-arc broadside for floor use, and its companion, the overhead "scoop". The mercury-vapor "banks", once so generally used for this purpose, have vanished.

The standard incandescent floodlight unit is the Mole-Richardson Type 45 "Rifle", using a single 1,000 or 1,500 Watt P. S. 52 mogul-based Mazda globe. By means of a rifle-corrugated, chromium plated metal reflector, the light is very evenly distributed over an angle of 60°. The lamp housing is an ellipsoidal duralumin spinning, corrugated for greater rigidity, and fitted with a globe-focusing adjustment at the rear, and with a built-in control switch. The lamp is supported upon a Y-shaped yoke, by which it may be mounted upon any of the standardized, tubular steel elevating pedestals made by the firm.

The corresponding arc unit is the same firm's Type 29 twin-arc broadside. This unit was developed especially for use in natural-color cinematography, and employs as its light-source a special 8mm. carbon developed for the purpose by the National Carbon Company. A separate mech-

TODAY'S trend among Hollywood's outstanding exponents of cinematographic lighting is toward the use of fewer light-sources and more actual lighting effects. Comparing the average set of today's productions with one even so recent as five years ago, one cannot fail to be impressed with this fact: fewer general lighting units are to be seen on the floor, fewer spotlight units are in use along the spot-rails, and overhead 'dome' and 'strip' units are seldom used. Moreover, the units now available are smaller, and of considerably greater efficiency than their predecessors. A particularly striking example of this

Modern Studio Lighting Equipment

by
William Stull, A.S.C.

anism is used to feed each of its two arcs, resulting in more uniform light-flux and silent operation. The rectangular reflector distributes the light uniformly over the required 60° angle, and a pivoted stub is placed directly below the lamp so that it may be mounted on the standard pedestal. The unit is made for operation on Direct Current only (115-120 volts), and when burned at 40-50 Amperes, produces an intensity of 220-foot-candles at 15 feet—more than 250% more than its pretalkie forebears. The M-R Type 27 "Scoop" is essentially the same unit, with reflector and mounting designed to permit its use as an overhead floodlighting unit.

Equipments of the spotlighting group are at present in a transitional stage: new and improved types are being introduced, and are supplanting the older units as rapidly as studio procurement programs permit. Many of these newer units, in addition to their improved performance, embody fundamental engineering advances in their application of principles not hitherto employed in motion picture lighting. It follows, naturally, that the units they replace are technically outmoded. For the sake of completeness, however, it will be well to mention these older, standard types as well as the newer designs.

The fundamental spotlighting unit in the incandescent range is the 2,000 Watt, 18-inch Sunspot, or reflecting spotlight, currently represented by the Mole-Richardson Type 220. This unit is used for general lighting of sets, for back and cross lighting to make both actors and properties stand out from the background, and for some types of effect-lighting. It may, in fact, be called the lamp-of-all-work on American sets, as it is used both on the floor and on the overhead lampgrid, and for almost every purpose. The lamp is built around a 2,000 Watt, 948-613 Mazda globe; either the mogul-based or the bipost type of globe may be used, but the latter is becoming the more popular style. The light-beam is formed by a parabolic mirror: generally a Bausch & Lomb glass mirror is used, though in some studios faceted, chromium-plated metal mirrors are preferred. "Spill-rings", to absorb all the non-parallel rays from the forward side of the globe, are universally used. In the earlier designs of this class, the pretalkie practice of making the lamp-housing of sheet metal was followed, and no little trouble was experienced with

the noises due to uneven expansion of the parts in the heat of the lamp. In the most modern Mole-Richardson types, the housing is a barrel-shaped casting of aluminum alloy, and the removable back dome, which holds the reflector, is a heavy stamping, ribbed for stiffness. All auxiliary parts are fitted in such a way as to have unrestricted (and therefore silent) expansion. The switch and focusing control are built into the bottom of the lamp-housing. The useful range of beam-divergences of this lamp is from 8° to approximately 24°.

Where higher intensities are required—as in back and cross lighting on large sets, front-lighting in extremely deep ones, in special situations where a large amount of light must be supplied by relatively few units, and for high-intensity effect lighting—the 24-inch Sunspot (M-R Type 226) is used. This is essentially similar to the 18-inch unit just described, but built around the 5,000 Watt G64-C13 bi-post type Mazda globe, and utilizing a 24-inch Bausch & Lomb glass mirror and spill-rings. On rare occasions, a 10,000 Watt (10-KW), 36-inch unit is also used.

(Continued on Page 435)



Rifle



Baby Spot

Junior Solar Spot

200-Watt Spot Light





Fig. 5. Mechanographic sound track showing resolution at 50,000 cps., at a recording level 55 db below maximum.

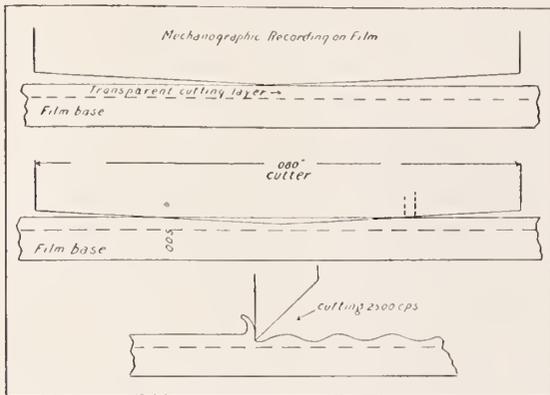


Fig. 1, bottom, the cutting tool used in the mechanographic system.

FROM time to time there have been presented to the Society papers dealing with the methods and problems in connection with recording sound for motion picture accompaniment. In the beginning these papers had to do with recording on wax and of late with the photographic processes of recording on film. There is still a third method which has not yet been described before this Society and which is destined to play an important role. The introduction of this method is the reason for this paper.

The four present-day commercial methods may be defined as follows:

MECHANICAL—Wherein the recording and reproducing are done mechanically.

PHOTOGRAPHIC—Wherein the recording is done photographically and the reproducing is done optically.

MECHANOGRAPHIC—Wherein the recording is done mechanically and the reproducing is done optically.

MAGNETIC—Wherein the recording and reproducing are both done magnetically.

As far as motion picture recording is concerned, the mechanical (or disk) system has been eliminated and the telegraphone is not adaptable, so we can consider principally the other two systems, the photographic and mechanographic. Under the heading of photographic we must include the variable-density and the variable-width systems of recording, in considering the limitations of each. All

With variable-density film recording, the limiting factors are numerous, such as lens dispersion, width of recording slit, fogging and spreading of the image in the emulsion. In addition, there are critical factors that must be accurately met, but can not be listed directly as limiting

Mechanographic

factors, such as light exposure, uniformity of the emulsion, matching emulsions from negative to positive, printing exposure, development time, etc.

With variable width recordings the limitations are lens dispersion, film image spreading, fogging, emulsion irregularities and width of the recording slit. In fact, with these two systems Kellogg's simile can not be improved upon: "We have given our painter not only too big a brush but a piece of blotting paper upon which to make the picture, and paints that run" (Fig. 3).

With these things in mind we survey the field to see exactly what it is we want in the way of a recorder for a motion picture track, and then check against what is available. First, as has been proved by practice, the sound-track must be upon the same film with the picture. This eliminates from consideration both magnetic and mechanical systems. Now, assuming the same quality among the other methods, I should say choose a variable-width track, because the critical conditions of recording are more easily fulfilled, and it is much safer to transfer photographically from the negative to the positive. This is especially important where dupe negatives are used in the foreign markets. The next thing that is necessary is an immediate playback, and by this I do not mean the playing back of some make-shift record taken on an entirely different recording system, but the immediate playback of the finished record which is to be used for production purposes. Not only can the quality of the picture be improved by due application of this principle, but the cost of production can be reduced also. In order to make this point concrete, mention might be made of two pictures which were released with an interval of time between, in which the same operatic star appeared, the first picture a failure and the second a grand success. Non-technical persons whom I have interviewed have agreed that the sound of the first was bad and that of the second exceptionally good, whereas technical men have told me that the first was good and the second so bad that changes in the reproducing equipment were necessary before the picture could be shown in the theater.

The next step in our survey then brings us to the mechanographic system as the only means of achieving all the desired results described. By means of this method it is possible not only to play back the completed record as soon as it is recorded, but to play the record while it **is being recorded**, with a delay corresponding to four frames of the picture. We are also able by this method to reduce the paint brush to which Kellogg referred to an irreducible minimum and to eliminate the blotting paper.

The first mechanographic machine was built in Berlin in 1891, and consisted of a paper strip coated with a black layer into which was cut a lateral groove, thus removing the black layer within the groove. Upon this groove was cast a strong light, which passed through the paper and through a lens which focused a half-image of the track

Recording for Sound-Tracks*

by
J. A. Miller**

upon a slit, behind which was placed a selenium cell which in turn operated a telephone receiver. Considering the materials available at that time it will be realized that that was a big step; but with present-day knowledge it is easy to see how the physical limitations of the equipment and materials would admit of only the most primitive results. Nothing further seems to have been done with the system until 1930, when Berthon reinvented it, and in conjunction with Nublat, developed a machine that was put upon the European market as a phonograph, and known as the Nublat machine. The later models of this machine, instead of cutting into a black layer, were made to cut through the center of a thin black film, thus making a sound record upon the edge of each half when the film was split. Printing was done with cylindrical optical enlargement in order to increase the amplitude of modulation. The results attained were only fair, as might be expected on account of the severe physical limitations. It will be seen that at a frequency of 6000 cycles and at standard motion picture speed, and with a cutting tool having a heel angle of 45 degrees, it is possible to cut to an amplitude of only 0.002 inch, whereas on amplitude of 0.080 inch is required for motion picture film. At the same time, if it were possible to reach practical amplitudes the power required would be enormous; in fact, several kilowatts would be required to record up to a frequency of 10,000 cycles per second. Although the machine was introduced upon the phonograph market in France, the quality was not good enough for the motion picture field.

It was not until 1931 that the invention was made which now makes it possible to attain with the mechanographic system better results than with any other system. The system now used, known as Millerfilm, makes use of a special film having a coating of clear material upon the base, which in turn, is covered by an extremely thin layer of opaque material, approximately two microns thick. For all ordinary purposes the film is very tough and durable: in fact it can not be scratched by the fingernail. The cutting tool (Fig. 1) is a specially prepared sapphire, the edges of which make a very oblique angle with the

surface of the film. Instead of cutting a lateral track as heretofore, the track is hill-and-dale. It will now be observed (Fig. 1) that a very small movement of the cutting tool in the vertical direction produces a great change in the quantity of black layer that is removed. Thus is attained a mechanical amplification of from fifty to one hundred times, comparing the movement of the cutting tool to the variation of the width of track cut. Instead of having to move the cutting tool 0.080 inch for full modulation of the sound-track, it is now possible to attain full modulation with a tool movement of 0.001 or 0.002 inch.

Many tests were conducted to determine what material could be applied to a film that would be flexible, transparent, and have the same cutting characteristic as wax. Upon the surface of such a layer must be placed an extremely thin layer of opaque material having a fine grain structure which will cut with a smooth surface, have sufficient strength to withstand damage, and have a definite line of demarcation between the opaque and transparent sections. This was a complete research problem in itself, but film is now available that fulfills all these requirements; and when it is cut, as can be seen in Fig. 2, the line of demarcation is much more definite than can be achieved photographically. The importance of this fact must not be overlooked, as the limitation of all systems depends upon the definiteness of this line of demarcation on an unmodulated track. If the maximum modulation of the track is of 0.080 inch, and the desired range 125 db., then the first 100 db. must be included within modulation peaks not exceeding 0.004 inch high, which does not allow for much irregularity in the line of demarcation. It is possible to obtain film of this sort with the black pigment in colloidal form and of such concentration that grain size is no longer a factor as in the photographic process. The edge to which a sapphire cutter can be ground is microscopic; whence there is no limitation that corresponds to the width of the recording slit, so that frequencies as high as 25,000 cps. can be recorded (Fig. 3). Of course, in reproduction, the width of the reproducing beam enters as a detrimental factor, but in this case it is not so important as in recording, and is far better than any needle could be. Irregularities of the emulsion are no longer present, and even the surface of the film where it has been cut is much improved over a plain emulsion surface.

The cutter was the next item of importance, and required a wide departure from current practice inasmuch as it has to be a constant-amplitude device. In order to

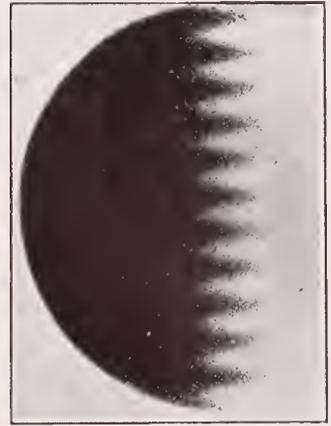


Fig. 2. 6000-cycle recordings; original negatives: (a) photographic sound-track; (b) mechanographic sound-track. 100x

*Reprinted from July Journal of the Society of Motion Picture Engineers as presented at the Spring, 1935, Meeting at Hollywood, Calif.

**American Mechanographic Corp., New York, N. Y.

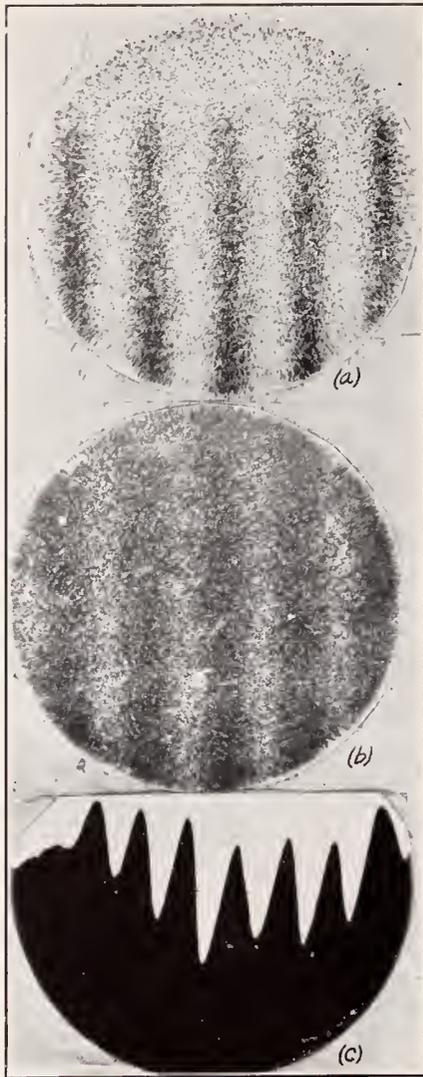


Fig. 3. Illustrating the advantage gained in noise-reduction due to irregularities in the transparent portion of the film, and the sharp demarcation in the mechanographic recording; 9AO SMPF standard, tips 6000 cps.; (b) SMPE standard base 6000 cps.; (c) mechanographic sound track at point where 7000 cps. occurs.

gain sufficient movement at high frequencies it is necessary to tune the element to a high audio frequency. A cutter has been produced that will record up to 10,000 cycles per second with a power consumption of about two watts. From this it is easy to understand the impracticability of the old mechanographic system with a lateral groove. The movement of the element would be fifty times greater, whence the requisite power would be in proportion to the square of this figure, or 2500. In addition, the efficiency would be only one-tenth as great, on account of the additional air-gap, which would make the power ratio 25,000 to one. In other words, instead of two watts, the cutter would require about fifty kilowatts. The details of construction of the cutter can not be given at the present time, but the response curve of a typical example can be constructed flat within two db. for 30 to 8000 cycles or from 30 to 10,000 as desired.

A study of an original record of the process leads to many interesting observations. More than one track can be recorded upon the same piece of film. Cutting and re-recording can be done from the original. Short ends can be utilized. There is no darkroom loading of magazines. Examination of the track shows that the groove is cut clean, the surface is as smooth as glass, the opaque por-

tions have a density too high to measure, and that the transparency of the clear portion is uniform.

The perfect recording system would encompass about 125 db., but with the present photographic systems the range varies between 35 and 45 db. and with hill-and-dale acetate records from 50 to 55 db. Noise reduction methods reduce the disturbance introduced by irregularities occurring in the transparent part of the track on a dirty film, but have no effect upon limitations caused by irregularities of the materials of the record carrier at the line of demarcation. Eight or ten db. are gained in this manner if the film is bad, but any real extension of the range must be accomplished by improving the material of the carrier itself. That this improvement is accomplished by the mechanographic system is clearly seen in Fig 3, and it should be possible to have a consistent working range approaching 75 db. by this method. This can be appreciated better by realizing that if the same degree of perfection of the record carrier is

arrived at as is reached with an acetate record of the hill-and-dale type, then the advantage gained is of the order of 50 db., which would indicate a possible range of 100 to 105 db. We assume first that all major imperfections are easily removable and that the ones most difficult to remove are of an order of magnitude of 0.0005 inch or less. In a hill-and-dale mechanical record this irregularity produces 100 per cent modulation at 6000 cycles, whereas on the mechanographic record it would produce a disturbance of 50 db. below full modulation on account of the difference between constant-velocity and constant-amplitude recording.

In other words, when the time arrives for sound to be brought up to the standard that is now being demanded by a large part of the public, it will be necessary to re-record mechanographically on each release print. Of course, in the meantime photographic copies of mechanographic track can be used, thus obtaining a result that lies between the present photographic method and the direct recorded mechanographic (Fig. 4).

In conclusion, in Fig. 5 is seen a sample of resolution at 50,000 cps., 55 db. below maximum, that is better than can be achieved by photographic methods at 5000 cps.

Fig. 4. Photographic copies, or prints: (a) from photographic sound track; (b) from mechanographic sound track; (c) from photographic sound track. 300x



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Ray Fernstrom, A.S.C.

Streamlined Cameras For the Air

by
Ray Fernstrom, A.S.C.

IN PHOTOGRAPHING the aerial and Akeley scenes on Universal's "Storm Over the Andes," I was impressed by the problems the near future presents the photographer of such subjects.

To begin with we had an airplane that travelled at 230 M.P.H. in level flight that was capable of 275 in dives such as we used in chase scenes. When an Akeley man has to follow such objects with short focal length lenses he is kept spinning to keep up. Of necessity short lenses must be used due to restricted areas, such as canyons with no opportunity to move back for the telephoto shot that such fast pans call for.

When it comes to mounting set cameras for background

process keys on these faster, ever faster planes, we come to streamlining, as the only solution. Now that Howard Hughes has flown his ship at 352 M.P.H. the future air film becomes a most interesting probability for the cinematographer who is trying to prepare for all eventualities.

My first experience with really fast ships came last year when the Army received their new streamlined Martin bombers. These planes fly along loafing at 250 M.P.H. and my job was to photograph a squadron of eighteen in various formations over clouds and mountains. Of course the only camera ship that could keep up with them was another Martin which the Army made available. For the general long shots in the air we arranged the rear cockpit for the Akeley. This cockpit in Army usage has a sliding transparent cover over the entire opening. Fortunately this cover extends far out over the top edge of the fuselage. By removing the rear and sliding center section a large overhanging "V" shaped windshield remained. In practice this served excellently with the Akeley mounted inside the fuselage and as close as possible to the protection of the shield. Naturally there was no chance to aim in any direction but backwards and sideways. For scenes shooting forward the machine gun cockpit in the nose of the plane, which looks like a scarf ring with a large half of an egg over it and a slit for the machine gun to shoot through, was our scene of action.

By mounting the Akeley with its photo lens shooting through this slit and using a Mitchell finder lined up above we had a real streamlined camera blimp, although panning was limited. This in part was overcome through the fact that like all scarf rings made for machine guns they can be swung and locked in any desired position. Incidentally whenever this housing was swung in the air a terrific wind blast tended to turn the slit all the way backward. With optical glass and a larger slit this type of camera mount would be ideal for shots requiring this setup at high speeds. Nevertheless, with the exception of Army pictures where such equipment is at the disposal of the aerial cinematographer, the cost of these planes makes them impractical for picture use, generally.

After the experiences with "Storm Over the Andes" the writer together with our chief pilot Herb White made a few tests on the fast ships used in the picture, to determine the effects on control of the ships and on cameras, when the two were combined for high speed use.

Together with Vance Breese, its builder, we made a flight, after first removing the hatch above the pilot's cockpit. At two hundred and ten miles per hour I ventured up and out into the slipstream to see what would happen. The pressure was so great it snapped my goggles around my head and the blast almost popped my eyeballs from their sockets. I found afterwards that by peeking just over the edge of the windshield but still out of the blast, that no dangerous amount of pressure resulted. This taught us that we could design windshields for all cockpit shots where the cinematographer operates his camera on a so-called free head or Akeley tripod, shooting over the sides or through doors. Next we found it quite a simple task to cover the camera for set shots atop the fuselage or under it, as described in an earlier issue of "The American Cinematographer" by Charles Marshall, A.S.C. In so doing we designed a cover similar in appearance to the "pants" seen on many streamlined wheels of modern airplanes. First we cut out a hole to correspond with the front of the sunshade opening. A piece of optical glass fitted into this prevented any air leak into the housing. This

(Continued on Page 434)



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The Genuine Never Palls

---Is Dan Clark's Experience

by
Harry Burdick



Dan Clark, A.S.C.

DANIEL B. Clark has probably paraded more exterior scenes through his camera from lens to negative than any other cinematographer now practicing. And by that very token, though seemingly a paradox, he has won inclusion in the upper brackets of those who possess exceeding abilities at capturing finest impressions of interior views.

Beyond shadow of question, Clark holds all world records for placing so-termed "westerns" on celluloid. No less than eighty-six of these wide-open sagas have been done by him. He functioned as cinematographer for all of the Tom Mix "hoss operas."

He has translated so many of Zane Grey's stories to the screen so many times with so many different stars, he is one of the ablest authorities on that writer's renowned works.

His camera is a veritable catalog of the points of rare scenic beauty throughout the western sector of the nation.

Lensing of exterior scenes provides for the ambitious cinematographer the broadest and most extensive grounding in the arts of the profession, according to Clark. Here the camera portraitist must adapt himself to prevailing conditions rather than merely film a set scientifically designed to fill his needs.

After wrestling for a term of years with Nature's sets, with all their natural imperfections, and with Nature's ever-changing lighting system, the controllable factors encountered in photographing man-made sets with man-made light simplify to Clark the routine problems of studio photographic production. As the result, these studio-made cinematographic contributions of Clark invariably convey an appealing charm and rare warmth of genuine beauty.

Clark had his early training in a rugged school that stressed the genuine in all things and violently shunned all matters fringing on the artificial. So thoroughly did he become imbued with this underlying trait of the outdoor dramas that he finds himself carrying the same truthness and sincerity into his current dramas of more sophisticated and domestic content.

He must, as instance, always have, or establish, an apparent and logical source of light on studio set just as he always found when utilizing the sun. He indulges in few incandescent calisthenics; he cares little for the unreal lighting technic begot of the theatre. He adheres closely to the effects he has observed so many thousand times outdoors, and simulates that reality on his carpentered sets.

Hence, he imparts a definite feeling of believability to his audiences. His projected scenes live and actually exist for their brief screened interval. He instills the same basic ingredient of genuineness to the daintiest feminine star as went into his washbucklig heroes of yesteryear. He wants beyond all else that his characters appear real flesh-and-blood individuals rather than figures from a storybook.

This ardent devotion to the early teachings he received from Nature's school of lighting has reflection in the outstanding genuineness and correctness of his current works.

An able instance is his recent "Charlie Chan in Egypt," not perhaps a head-lined work but one calling for the exercise of wide cinematographic talent. Here, maintenance of proper mood governed the film's very success. Deviation from this exact level of mood would have made the story wholly unbelievable and trite. Action called for views depicting opening of ancient tombs in old Egypt. These, of course, were built on the studio premises. An archeologist of note designed them. A wealth of scientific detail went into their fabrication.

Then Clark faced the engaging problem of reproducing these exactly-made scenes in manner to convince audiences they were of centuries-old genuineness.

Sunlight, of course, could not penetrate these tombs. Yet they must be given photographic illumination that would be plausible. This was accomplished by working in very low key, always with shafts of light emanating

from definitely established sources. In the outdoor toms this was gained by previously registering the explorer's work lights. When he went to the inner rooms of the tomb, he told his entire narrative by simulated hand searchlight effects. Throughout the sequence he used not more than two lights at any time. The completed effort carried unconvincing conviction; by no stretch of one's imagination could the audience be viewing scenes artificially created. Which, in the final analysis, is truest criterion of cinematographic genius under contemporary production conditions.

He is never content merely to lens a series of scenes put before his camera in impersonal fashion. He assumes the broader scope of the true cinematographer—to contribute through the wizardry of his arts all that will make the finished work more real, more genuine, more believable—and hence, better entertainment.

It is significant that, almost without exception, when stars view their screened efforts they comment that never before have they been so obly portrayed.

Clark has amply demonstrated his abilities to transmit these longed-for characteristics to the screen regardless of locale.

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"Still" Photography in Natural Colors

(Continued from Page 423)

might be one in which one or both of the remaining primary colors may have been present in our object: the color of the printed image, then, must not only be one which completely absorbs red, but which reflects green and blue! It will therefore be a blue-green, or "Minus-red." Similarly, the green-sensation negative will be printed in Minus-green or Magenta, which absorbs green, but reflects red and blue; and the blue-sensation negative in Minus-blue, or Yellow, which absorbs blue, but reflects red and green.

Superimposed full strength, these colors absorb all colored light, and produce black. Intermediate colors are reproduced by varying proportions of the three primary colors, while a total absence of all color gives us white—the color of the paper base where no ink reaches. Thus this time we have achieved our full-colored positive by beginning with the polychromatic light reflected from the white paper, and—by printing with inks corresponding to minus-colors, instead of the actual colors themselves—have subtracted various monochromatic components to produce the various primaries and intermediate shades. Such a process is termed **SUBTRACTIVE**.

In addition to trichrome, which will obviously give the most perfect results, the commercial consideration of mechanical simplicity has given impetus to considerable study of two-color processes. As has already been mentioned, it is possible to synthesize white light from certain combinations of two colors only. Similarly, by a proper selection of the two component colors to be used, it is possible to reproduce a fair range of intermediate colors. All of the commercially-used processes of natural-color Cinematography from Kinemacolor up to the recent introduction of three-color Technicolor, were two-color processes. If we analyze a typical pair of two-color filters, say the Wratten Cine Green No. 40, and Cine Red No. 28, we observe the following characteristics. Cine Green transmits practically from 480, while Cine Red transmits from 580 to 700. The range in a set of trichrome filters is from 370 to 700, so in two-color processes there is bound to be a certain falling off in the violets and blues, which would affect both the shadows and the reproducible range of colors. Precise control of the complementary printing-inks, and a careful selection of the colors in the subject to be reproduced, can to some extent offset this, and lend charm and a certain fidelity to reproductions in this process. In theory, the use of dichromatic dyes in printing should permit the reproduction of a color scale very nearly as great as is obtainable in all

but the most perfect three-color processes. How well this works out in practice can be judged from the remarkable results seen on the screen in recent Cinecolor releases.

In two-color still photography, this principle is generally utilized by an adaptation of the bi-pack method familiar to all Cinematographers. The front, or blue-record negative is an orthochromatic film embodying a red filter, while the rear, or red-orange record is a regular Panchromatic type. A normal print is made from the rear negative upon bromide paper, and toned blue, while the front negative is printed on dichromated gelatin, and given a red-orange tone with a dichromatic dye. The tonal range in this image is from an extremely pale yellow-orange in the thin parts, to a pronounced orange-red in the denser portions. When this transparency is placed in proper register over the blue print, a two-color print on paper, with a truly remarkable, if limited, range of reproduced color results. Such processes usually fail in the correct rendering of blue, violet, magenta and purple, but will give excellent renditions of orange, reds, greens, greys and blacks.

BIBLIOGRAPHY. The following standard works on color photography have been of great value to the author in preparing this article, and are recommended to all readers interested in delving more deeply into the subject:

- "The Theory of Three-Colour Photography," Van Huebl—Penrose & Co., London.
- "Principles and Practice of Photography," Carol B. Neblette—J. D. Van Nostrand Co., New York.
- "History of Three-Colour Photography," E. J. Wall—American Photographic Publishing Co., Boston.
- "Die Praxis der Farbenphotographie," Koenig and Jacobsahn—Union Deutsche Verlagsgesellschaft, Berlin.

Streamlined Cameras for the Air

(Continued from Page 430)

streamlining prevents buckles and a great deal of unnecessary vibration. In the past, propeller and wind blasts whipping at take-up belts have caused many a buckle on cameras using outside magazines, in the air.

In regard to wing mounts, the same kind of streamlined cover is essential on the newer speed ships but must of necessity, for control of the ship, be kept as small as possible. This means that saddles must be made probably a part of the wing, which is not difficult when such a small camera as the Eyma is made use of.

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achievements in the air. Faster commercial airline schedules, trans-Pacific flights, girls setting new records, aerial war possibilities, Bendix air races, stratosphere flights, and faster Army and Navy planes. In the past the news story of one day became the motion picture of the next. With faster planes in the news of today it is only reasonable to expect that the air pictures of the near future will insist on modern high speed flying equipment, and camera ships to keep up with them. "Storm Over The Andes" is probably only the first of many such pictures to come, and when they do, the Aerial Cinematographer must be ready with streamlined camera ships, mounts and cameras.

Solarspot utilizes a spherical mirror behind the globe in combination with a Fresnel-type lens, 10 inches in diameter and of a desirably short focal length, to give a powerful beam of almost ideal distribution at all angles from 8° to 44°. The housing of this lamp consists of a cast aluminum alloy body, with an inner liner of duralumin. Due to the large diameter and short focal length of the lens, together with the mirror which reflects the ordinarily wasted rearward rays, the Solarspot utilizes a greater proportion of the light from its globe than does any other type, while the design of the lens minimizes transmission loss and breakage hazards, and affords an evenness of distribution hitherto unattainable. It is understood that a larger "Senior Solarspot" will soon be available.

Summing Up Modern Studio Lighting

(Continued from Page 425)

The condensing-lens types of spotlight are distinguished by a wider useful range of beam-spreads—in general from 8° to 44°—by considerably better beam-distribution, but much lower intensity within the beam. The smallest and most frequently used of this line is the 500 Watt "Baby Spot", M-R Type 129, which is generally used with a 500 Watt, T-20 intermediate base projection type Mazda globe, though some cinematographers at times fit them with standard Photoflood bulbs. The housing consists of an integral cast aluminum body, with a hinged ventilating cover above, giving free access to the lamp. The lens is a plano-convex type, 5 inches in diameter. The lamp is mounted on a U-shaped yoke which may be mounted on a variety of pedestals, including that of the Handilamp ("Lupe") to be mentioned later, or placed in positions in the set where heavier equipment could not be used.

Intermediate in this range is the 1,000 Watt spotlight, M-R Type 36, using a G40-C13 Mazda globe with a 6 inch diameter, 9 inch focus plano-convex lens. This is also of integral cast-aluminum construction, with a C-shaped supporting yoke which permits utilizing almost the whole of the right side for a door.

Largest of this class is the 2,000 Watt Type 26 spotlight. This also is of integral construction, and uses a G48-C13 Mazda globe with an adjustable spherical mirror and an 8-in. plano-convex Bausch & Lomb lens, made of special heat-resistant glass.

Rapidly superseding both these types and the 18 inch Sunspot is the newly introduced "Junior Solarspot," which combines the advantages of both types with few, if any, of their disadvantages. Built around the 2,000 Watt G48-C13 bi-post Mazda globe (pre-focused), the

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The fundamental carbon-arc spot-lighting unit is the 80 Ampere Rotary-carbon arc spotlight, which, like its incandescent prototype, is being supplanted by a more modern lamp of entirely new design. The "80" is of the conventional condensing-lens spotlight type, using a rotary-carbon, high-intensity arc as a source. The carbons, which are motor-fed, are a 1/2 inch by 12 inch 80 Amp. rotary spot positive, and a 5/16 inch by 9 inch (or 3/8x9) copper-coated negative. The current used is Direct Current only, 73-80 Amperes, 50-55 Volts at the arc.

For purposes where higher intensities are needed, the 24 inch Sun Arc, a reflecting type using a 24 inch diameter glass mirror, is used. This also is a rotary-carbon high intensity arc, using a 16mm. x 20 inch high intensity positive carbon and an 11mm. x 10 inch plain-cored negative carbon, operated on D. C. at 135-150 Amperes, 68-72 Volts at the arc.

When the highest possible intensity is required, the 36 inch Sun Arc is used. This, too, is a mirror-projector, using the same trim as the 24. One studio also has several special 60 inch Sun Arcs.

The 80 Ampere Rotary is being to a great extent supplanted by a new and more efficient type embodying the optical principles of the (incandescent) Solarspot. Details of this new unit are unfortunately not yet available for publication, but it may be stated that it has much the same beam-distribution as the Solarspot, and has been rated by members of the Technicolor camera staff as being more than equal to a 24 inch Sun Arc. It represents part of an intensive development program undertaken for Technicolor by Mole-Richardson, Inc., and the National Carbon Company, both of whom have contributed basic improvements to the modernization of arc lighting.

Outstanding among the many "special-purpose" lamps is the Hand-lamp or "Lupe", M-R Type 127. This unit is designed particularly for deft manipulation in close-up photography. It consists of a conical spun aluminum shell holding a chromium-plated metal reflector and a 1,000 Watt T-20 frosted airway-beacon Mazda globe. As the globe can be focused, it is possible to graduate the intensity of the light very precisely from full intensity to a very low level of illumination. The Lupe is available either on a simple elevating pedestal, or on a special extension-arm mount which makes it possible to use the lamp in any position and at any height from the floor level to eight feet.

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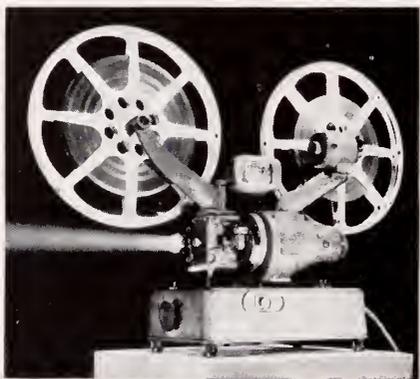
Filmo pictures are rock-steady on the screen because of the microscopic precision of all film

handling parts and the perfection of film registration, both vertical and lateral, at the aperture.

Filmo Projectors illuminate every part of the screen with practically equal brilliancy. Thus they carry through to the screen the full beauty of your photography.

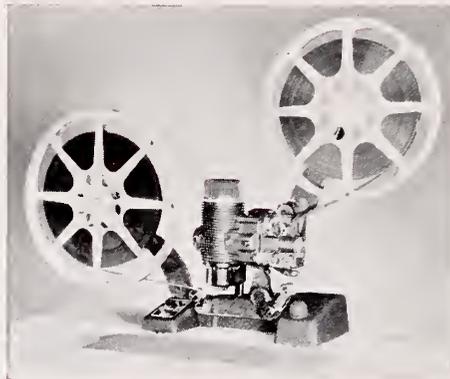
Your films will look better when you show them with a Filmo. And they'll last longer, too, for Filmo protects them at every point from surface abrasion and from perforation wear.

There are Filmo 16 mm. Projector models for every need. Three of them are pictured below.



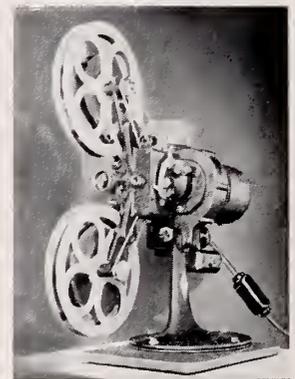
Filmo 130 — 1000-Watt

Adequate illumination for the largest auditorium. 1600-foot film capacity (one-hour showing); 2-inch F 1.65 lens, instantly interchangeable; variable lamp resistance and voltmeter; variable speed governor (16 to 24); separate motor for take-up and fast power rewinding; pilot light; interlocking controls; two-way tilt; film conditioner; low center of gravity; adequate cooling for the 1000-watt lamp.



Filmo 129—750-Watt

Similar in appearance to the Model 130, but for smaller audiences. Low center of gravity; 1600-foot film capacity (one-hour showing); power rewind; two-way tilt; 2-inch F 2.1 lens, instantly interchangeable; pilot light; reverse; still projection. The 750-watt lamp may be replaced with a lower powered lamp when less illumination is needed and greater economy is desired. Variable resistance and voltmeter are optional.



Filmo S—500- and 750-Watt

A low cost projector, but with the same basic operating mechanism as Filmo 129. Has 2-inch F 2.1 lens; two-way tilt; power rewind; lamp switch; reverse; still projection; 400-foot film capacity.

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F 3.5 lens is standard; F 1.8, F 2.5, and telephoto lenses are available. Both spyglass and reflecting viewfinders. Built-in exposure chart; two film speeds—16 and 24 frames; single-frame exposure button for animated effects. Weighs only 2 pounds 5 ounces, measures only 2¼ x 3½ x 5¼ in.



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AMATEUR MOVIES



this issue

Cinetricks with Mirrors
What is Composition?
Making Added Scenes
Unusual Cine Apparatus
Kodachrome Indoors
... and other features

OCTOBER
1935



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AMATEUR MOVIE SECTION

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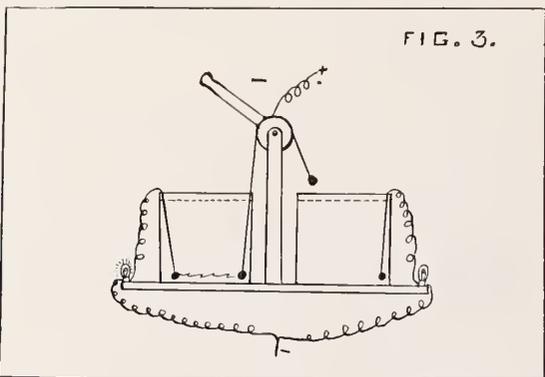
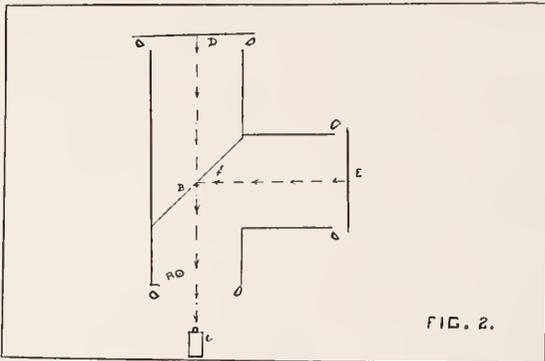
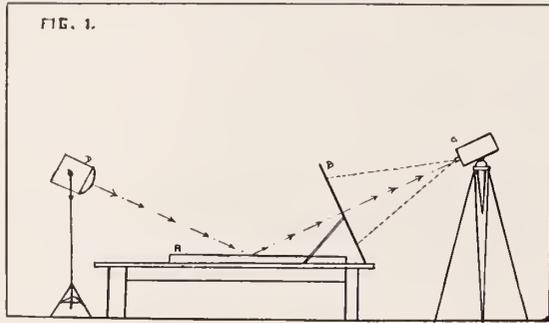
WHEELS of Industry450

Next Month . . .

●Several outstanding contributions from A.S.C. members. J. Belmor Holl, instructor at University of Southern Colifornio in the School of Cinematography, will give you more fundomental information about composition. Before entering the motion picture field Mr. Hall was a prominent artist in the East. He was drofted by the industry several years ogo to enter their ort department ond lend his tolent to this interesting business.

PROFESSIONAL Criticism of the Amateur picture is a port of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Let's Try



Next, suppose the girl is, say, two feet from the glass, which, in turn, is eight feet away from the lens. The correct focus will be eight feet plus two feet, or ten feet.

One of the simplest mirror tricks is done with two unframed mirrors, set at an angle of about 75° to each other, and with their inner edges touching. The subject takes his place between the mirrors, with his back to the camera, which is carefully screened behind a curtain. How many images you get will depend upon the width of the mirrors: with wide ones, you can get five different angles on your subject—the direct back view, and reflected profiles and three-quarter front views from either side. The vital part of the trick—as in all mirror trickery—is to keep the camera's view confined to the mirrors: if you shoot beyond their edges, you simply give away the trick. If you can get full-length mirrors, incidentally, you can make very interesting full-figure shots this way.

Next comes the trick of multiplying one person or object infinitely by the use of two mirrors parallel to each other. You put your subject between the mirrors, and aim the camera toward it, just clearing the edge of the nearer mirror. If you line things up properly, you'll get first the direct view of the object itself; just beyond it, the reflection in the farther mirror; next, the re-reflection of the nearer image, followed by the re-reflection of the first image, multiplying and re-multiplying till Gertrude Stein and Einstein couldn't figure it out. Naturally, with the size of mirror that most of us have available, miniatures and close-ups are about the limit; but if bigger mirrors are available, full-length shots are just as easy to make. It is important, of course, to make sure none of your lights reflect directly into the mirrors.

The other day, William Stull, A.S.C., told me of a time when, on location several hundred miles from Hollywood, he ruined his last filter just when he had to get a heavily-corrected filter-shot of some clouds. Remembering his high-school lessons in polarized light, he made the shot by photographing the reflection of the scene in a black mirror—which gave him a black sky against which the clouds stood out beautifully.

But here's an even simpler way to get filtered cloud-effects for title-backgrounds. You don't even have to have any clouds! Figure 1 shows the set-up. You place an ordinary mirror flat on top of a table, and above it slant B, a piece of glass, which carries your lettering. The camera is at C, shooting down onto the glass. On the other side, at D, is a strong light—preferably a spotlight—which is focused on the mirror. The space between the camera and the opal glass should be kept as dark as possible. On top of the mirror sprinkle a fine layer of sand, brushed thin with a tuft of cotton. When you are ready to shoot, blow

WOULD you like to make lap-dissolves without re-winding—to dissolve backgrounds without changing the foreground—to make 'arty' titles with moving cloud backgrounds, in which the clouds blow into words—to make a single actor play bridge with himself, or even multiply into an army—all at a single 'take', with any 16mm. or even 8mm. camera?

Don't say such things can't be done. They can be—with mirrors!

But before we get too deeply into these tricks, let's clear up the fundamental matter of focus; if we don't, it will surely trip us up later. Looking at a mirror, one would naturally figure that the mirror itself was the thing to focus on—but it isn't: if we want a sharp picture, we must set our focus for the combined distances from lens to mirror AND from mirror to object. For instance, if we want to make a shot of a girl sitting at a dressing-table, showing both the girl and her reflection in the mirror, here's the way to go about it: first, shoot from an angle, so that the camera won't be reflected into the picture.

Some Cinetricks With Mirrors

by
Jerome H. Ash, A.S.C.

a stream of air over the mirror (a small electric fan will often do nicely). As the sand skitters across the mirror, it blacks out the reflected light, and you get the effect of clouds against a dark sky. If you are shooting reversal film, the sand will represent the dark sky; if you are shooting negative (intending to use the negative for your title), the sand will represent the clouds. You can also get interesting effects of this type by using iron-filings, which you 'blow' by moving a magnet under the mirror.

Now, if you want the clouds to shape themselves into words, use a plain opal glass in the inclined frame, and trace your letters on the mirror with paste or mucilage. When you sprinkle on the sand, that that falls on the glue will stay put, while the rest will be free to blow away. Making the shot as a negative, you'll have clouds that blow around and finally shape themselves into the title. A slight degree of slow-motion often helps this sort of a shot, by the way.

This next trick calls for quite a bit of construction—but it is well worth it, for you can do no end of tricks with the device, once you have it made. You begin by making a shadow-box as shown in Figure 2. The three openings at "A", "D" and "E" must all be the same size. At "B" you place a sheet of plate-glass in the shadow-box, at an angle of 45° to the camera ("C"): and openings "D" and "E" must be the same distance from the glass.

In use, you place whatever foreground subject you wish at "A", and two different backgrounds at "D" and "E". Let's say we begin our shot with background "D" in use: the lights illuminating it are on, while those at "E" are off. When we want to fade our backgrounds, we dim the lights at "D", and slowly turn those at "E" on. The subject, at "A" is constantly illuminated, and moving normally. The result is that our scene begins quite normally, with the subject moving against background "D", and—without any change in the foreground action—the back-

ground suddenly lap-dissolves into an entirely different view!

The only limiting factor to this trick is the size of the pane of plate-glass "B", which reflects the scene at "E". Made on a small scale, the shadow-box doesn't cost much; and even with a fairly large pane of glass the cost will be reasonably low, for you can make the shadow-box cheaply out of a lath framework and black muslin.

The simplest way to lap-dissolve your background-lights is by using a water rheostat, which you can make for a dollar or so. You simply fill two gallon crocks with salt water, and hang a piece of insulated wire soldered to a metal weight in each crock. These should extend all the way to the bottoms of the crocks, and both are connected to one side of the electrical circuit. Next, you make a simple wooden framework above the crocks, with a couple of pulleys, over which you string two other weighted wires, connected to the other side of the circuit. These last two electrodes are arranged so that when one drops to the bottom of its crock the other is pulled out of its jar. Thus, the current is evenly switched from one circuit to the other, lap-dissolving the lights.

If you make this shadow-box set-up on a small scale, you can very easily make all sorts of lap-dissolves to cut into any of your films, regardless of when the films were actually shot. Simply enlarge one frame of the end of Scene A, and one frame of the beginning of Scene B, and place the enlargements at the two ends of the shadow-box. Make your lap-dissolve while rephotographing the enlargements, cut the lap into place between the two scenes—and there you are! Naturally, it will work just as well fading from a title to a scene, or a scene to a title, as it will fading from scene to scene. And it will enable you to use the first frame of any scene as a background for a title, with the title fading out, and the scene starting to move.

If you make your shadow-box big enough for full-size trick-shots, you can not only fade from one background to another, but you can create ghosts or spirits without resorting to double-exposures. In this case, the two backgrounds are identical—and they must be set up very carefully so that both the direct view and the reflected view coincide exactly on the film. Now, if you have your "ghost" in one end of the shadow-box, your "dissolve" will simply fade him in, without making the slightest change in either the foreground or the background. If you place a piece of furniture at "F", to conceal the ghost, so his image won't grow larger as he comes close to the glass, you can have him walk right out of the reflected scene into the foreground.



Parallel mirrors multiplied this miniature galley until Gertrude Stein and Prof. Einstein together couldn't figure out which was real and which reflection.

What Is Composition In Cinema?

by
J. Belmar Hall, Instructor
Department of Cinema, U.S.C.

COMPOSITION is not the special property of the painter. It belongs to all the arts, music, sculpture, architecture, writing; each must have structural form and in that form we have harmony. The film is particularly the medium of the combined arts. It offers the means of bringing to life the visual point of view, those special qualities of plastic form and conception, design and rhythm.

In order to have composition we must understand the principles, and these principles relate to all art forms. Line, being the element, must be understood and a glance at the chart on this page will explain fully what relation lines are to good composition.

If the camera and the cinematographer use their medium properly the most imaginary and fantastic results can be obtained. It is wrong for us to think of technique as anything but applied thought; it is not creative thought. When we think of motion, we can go to pictorial production, without any human element and convey a wealth of strange and fundamental meaning. Let us take some very simple rhythm; the machine is a good example of abstract motion. We need only the necessary imagination, the type of mind that knows what it wants, and is determined to get it. The camera is always ready to do our bidding, so we will start. The first shot we look for something to lead us into our subject, machines.

In front of us is a wheel, turning away from the lens, shoot a few feet of this, cut to wheel directly in front, hold for a moment and then allow the camera to take up the motion with wheel in direction it is going, as we come to bottom turn of wheel cut to a quick shot of anything moving in a vertical direction; we now have the circular and vertical line established. Reverse these and you have opposition, by panning we have the horizontal, shoot cog wheels and we get radiation and the closeup of cogs will give us the broken line as each cog comes into the frame. If you can wind back to take double exposures you will be able to hold on the screen each of these movements at the same time, thereby creating a greater emotional composition.

In this type of film many tricks can come into play. Your imagination can carry this on still further and as the tempos of the speeds of moving machinery pick up the film will have every movement shown in the chart of structural design. By bringing a clock into the scene with hands

Structural Art in Design

These elements are used in all ART principles found in a complete tangible IDEA.

Line * Form * Color * Notan or Neutral Value * Texture.

VERTICAL: Represents Height, Dignity, Strength, Support.

HORIZONTAL: Represents Repose, Rest, Adds Breadth and Stability.

OBLIQUE: The Contrast to Vertical and Horizontal. Represents Motion, Direction, Action.

SPIRAL OR CIRCULAR: Represents Emotion, Flexibility, Transition of Interest. The broken line is the accent of the above.

I) PROPORTION: Relationship of Dimensions

Space Divisions, Size Relations, Measure Relations, Ratio, Scale.

II) SUBORDINATION: Emphasis, Accent, Dominance, Principality. (Emphasis on center interest. Minor parts are essential to center interest.)

III) RHYTHM: (Formal) Measured Movement, Equality in Arrangement, Beauty, Grace, Order.

(Informal) Flexibility, Fitness, Free Movement.

IV) BALANCE: (Formal) Repose, Symmetrical, Bilateral, Triple, Multiform, Quadrilateral, Restfulness, Equalization, Likeness, Stability.

* (Informal) Asymmetrical, Balance of Equal Parts, Subtle Grace.

V) REPETITION: (A) Sequence, Movement, Progression, Relating to Line or Form, Etc.

(B) Alteration, Orderly Succession, Interchange, Counter Change.

(All over movement or alteration of line or form.)

VI) RADIATION: Divergence, Convergence, Radiation from a Center Point; an Axis; a Base; a Curve.

VII) OPPOSITION: Contrast, Variety, Diversity in Line or Form.

Symmetry, Contrast, Variety in Line or Form.

VIII) TRANSITION: Gradation, Subtle Change, Blending.

(Subtle addition to oppositional parts in composition by use of line or form.)

IX) HARMONY: Unity, Oneness, Congruity, Completeness.

* (Elements placed freely but in relation to center line.)

(Copyrighted by J. B. Hall, '34)

spinning around and freezing it at noon hour all machines stop as a whistle blows. This shot can be most effective if you shoot down on a whistle and pan it into picture so that it covers entire screen.

(Continued on Page 458)

Save It With "Added Scenes"

by
Walter Blanchard

EVERYONE in Hollywood is familiar with the retort of an early producer to a director who wanted to take his company to Yosemite: "A tree is a tree, and a rock is a rock: shoot it in Griffith Park!" Of course, the producer was thinking only of the expense of transporting a company to Yosemite; but without realizing it, he was expressing very succinctly one of the fundamental truths of film technique. Your Modern, fully conscious of his position among the 'New Intelligentia', would probably phrase it, "Consecutive scenes need bear no actual or geographical relation to each other in the filming; in the completed work, their filmic relation will be established principally within the subjective mind of the audience, and will synthesize an illusion of actual objective relationship." You can take your pick—the meaning is the same in either case: and it is something that is of practical importance to everyone who makes moving pictures.

Let's see how it works. What's the main weakness of most amateur pictures? Lack of close-ups to tie the scenic shots together, isn't it? Well, if "a tree is a tree, and a rock is a rock," it doesn't much matter where we make the close-ups, so long as they **look** as if they belonged with the long-shots!

It works professionally—in the studios—every day. For instance, let's say we want to "get over" the idea that Clark Gable gets into an airplane and flies to Timbuktu. We have a shot of a plane actually landing in Timbuktu, and a long sequence which is supposed to have happened in Timbuktu. We also have Mr. Gable, though we haven't shown that he flew to Timbuktu. To complete the thought, we make a close-up of Gable getting into the cockpit of a plane. Then we make a shot of the plane taking off from the airport. Next to that we splice the shot of the plane actually landing in Timbuktu, and the sequence that is supposed to have happened in Timbuktu. Presto! On the

screen, we have incontrovertible evidence that Clark flew to Timbuktu.

Or suppose we have a picture that was actually made in Abyssinia. It's a pretty good picture, but if some of the intimate, dramatic action were strengthened, it might become a great picture. But we've already spent too much time and money sending our troupe to Abyssinia to permit us even to think of sending them back again just for a few more scenes. So we plan out the action we'll need to complete our picture, and we study the backgrounds of the sequences they'll be cut into. Then we scout around near the studio, and find a bit of country which, in close-ups, at least, can 'double' for Haile Selassie's native heath. We shoot our needed action, cut it into the really Abyssinian sequences—and Solomon himself couldn't tell which was Abyssinia and which was California!

All of this works just as well when 16mm or 8mm film is going through the camera as it does when one is using 35mm. For instance, when I got married, I packed a 16mm. camera and plenty of film along with my extra collar and toothbrush. It would be mighty nice, I reasoned, to have a film record of the wedding and the honeymoon to show to my children and grandchildren; but when the

(Continued on Page 454)



Below, scene from picture as shot on trip. Above neutral close-up as shot at home to cut in for better continuity.



The New Zeiss Camera—multiple speeds—normallock—variable shutter—focus thru lens and many semi-professional features.

Some Unusual German Substandard Apparatus

Reprinted from *Filmtechnik*, July, 1935.

THERE are certain types of design and mechanical action that are found universally in every type of camera and projector, and this is just as true in the "substandard" field as in the 35mm. professional apparatus. The average substandard camera or projector is thus of rather stereotyped design, and few deviations are observed. The German makers of substandard apparatus, though, came rather later into the market than the first (American) manufacturers, and this had its advantages in that the weaknesses of the first models could be obviated by careful design. In the following article a number of so-called features of the various German substandard cameras and projectors are noted.

The drive in substandard cameras falls normally into

the three classes: (1) hand turn, (2) clockwork motor, (3) electric motor attachment at an extra price. In fact, the only camera that does not fall into one of these three classes is the "Amigo-Elektra", made by Gustav Amigo. Although this camera is neither heavier nor more bulky than other substandard machines, it has a small electric motor for drive, and has internal space for four small dry cells of the pocket-lamp type. It is also the only camera that will turn the entire 100 feet of film through without stopping.

Unusual construction is shown by the Siemens camera, which is of very original design altogether. It has no sprockets, is extremely simple to load, yet has a device for feeding the unexposed film to the gate, and has a loop-forming mechanism. Inside the charger or cassette the lower (exposed) film roll causes the unexposed top roll to turn forward, so that both rolls of film move together. This camera is also provided with a device to keep the clockwork in the best order possible: the motor may be run down after use without moving on the film.

Devices for making the business of taking pictures more easy are found in several German substandard cameras. The Siemens model D camera may be started and stopped by flexible release. The "Movikon" of Zeiss Ikon goes a step farther by arranging that the camera shall have a delayed-action release for the shutter button, which makes self-portraiture an easy matter. This last camera also has an indicating scale in the view-finder that shows how much film the clockwork will still run through the camera without rewinding.

On the whole, however, most of the deviations of the German substandard camera designs from the usual are connected with the lens itself. Direct focusing on the film—an action that every 35mm. camera must possess, or it is called inefficient—was first introduced by a German maker. The Nizo cameras focus direct on the film, for instance, and the new "Movikon" of Zeiss Ikon is also arranged to provide the same facility. It must, of course, be remembered that the finest device for direct focusing on the film is of no avail when the film itself is opaque. Although there are a number of reversal films that are opaque, others are not, and the negative substandard film is usually also clear. The positive grade of stock is also clear. For many purposes, such as trickwork and titles, very close work on small objects, and other similar subjects, the direct focusing on the film cannot even be substituted by the "reflex" focusing devices, since the latter cannot be used while the camera is running.

Focusing by scale is rendered unnecessary by the special design of the "Movikon". This is the first—and up to the present time, the only—substandard camera which has a built-in distance meter coupled to the focusing mount of the lens. There is also a device that compensates for parallax error between finder and the focusing mount of the lens, so that both focus and camera field can be extremely accurately determined without the slightest trouble.

Other original designs relating to the lens may be seen in the various Siemens models. The B and C models in this range are the only cameras having automatic coupling between the iris diaphragm and the speed control, so that when the camera speed is altered the lens aperture is automatically corrected to the proper value, and mistakes in exposure cannot result. The model D Siemens camera is not fitted with this device, since it has a battery of lenses. The model D, however, has a very useful point about it: the three lenses are arranged on a vertical slide,

(Continued on Page 457)

Reversible Film for Miniature Camera

by
Nina Morgan

ORIGINALLY introduced for studio work, the new Agfa Reversible 35mm film is finding great favor among miniature camera users. In the studios this film has been successfully used for background projection work due to the grainless positive it produces. A reversible film will give a positive of less grain and with finer definition than the negative-positive printing, because the reversible film is not printed through as is the negative. The method is the same as with all reversible films. The negative is shot in the camera in the same way as the Agfa Superpan negative which the Reversible approximates in speed. In processing the negative is developed, bleached, exposed to light and redeveloped, finishing up as a positive. It then can be projected for inspection of the shots. If a positive film for projection purposes only is required, the Agfa Reversible film fills this need without the necessity of bothering with the printing of a positive film from one's negative. However, the above is only one of the many uses for this film.

This type of film should prove of distinct advantage in the selection of locations for the studios. Photos of locations to be considered may be taken on reversible film with miniature cameras and viewed at the studio by director and cameraman as projected by a still projector such as the Leitz Udimo. In this way a still photograph is seen on the screen just as a motion picture audience would see the moving picture. Planning of camera angles, and filter effects could be done also in this way and viewed upon a screen. The same procedure could be carried out by amateur motion picture cameramen who desire more perfect final effects.

Victor Haveman and Paul Ivano have made test production stills with the Agfa Reversible used in their Leica cameras. Beautiful grainless enlargements have been made from these stills. The method is as follows: after



Production Still by Victor Haveman of Columbia Studios, Leica, Agfa Superpan Reversible Film, 8x10 Negative made by Morgan Camera Shop.

the reversible film has been processed, a large 5x7 or 8x10 negative is made by direct enlargement of the positive on Agfa Commercial film with an enlarger which takes 35mm size negatives, such as a Leica enlarger. The negative should be developed in a soft-working, fine-grain developer. Contact production prints or enlargements can now be made.

The above method has tremendous possibilities for amateur workers. Many Leica users have wished for a practical and easily manipulated way of retouching the small negatives. Often only one or two shots from the whole roll of film satisfy the requirements of the more advanced pictorial or portrait workers. Through the use of Agfa Reversible film in their Leicas, these photographers can now make larger negatives from the chosen positives. They may now retouch or block out upon a large negative after enjoying the advantage of shooting many, many arrangements of their subject matter at a low negative cost.

In portrait work Agfa Reversible film should find a wide popularity. Many portrait photographers prefer to use miniature cameras. Others use them for special purposes, such as: for photos of children, when they need to take many poses and when film cost is an important factor. Through the use of a positive film, the portrait photographer may project the pictures for his clients, thus giving

Continued on Page 456



Flat front lightings are best for Kodachrome, with back or side light put in only after you are sure of plenty of front-light for a good exposure.

When Kodachrome Comes Indoors

by
Walter Blanchard

WHEN you start shooting Kodachrome indoors, you'll find a world of new experiences waiting for you. The color possibilities of interior scenes are endless: and so are the problems of capturing them. Getting really good color interiors is far harder than getting good black-and-white ones—but the result on the screen is infinitely more satisfying.

Right at the start, I'd better warn you of two things. First, unless you have fast lenses and plenty of lights, you are going to find yourself limited to fairly close shots. Second, once you get started playing around with color-film and lights, you've contracted an incurable disease: nothing will make you happy but more color-film and more lights.

Nearly every kind of film used today is quite a bit less sensitive to artificial light than it is to daylight. Some

films are a good deal less than half as fast under Photofloods as under old Sol. Kodachrome, in this respect, behaves like any other film. The Weston exposure-meter people recommend a meter-setting of 6 for outdoor exposures with Kodachrome: but they advise setting the meter at 2 when Kodachroming under Mazda or Photoflood light. With the older meters, this means setting the indicator three notches beyond (that is, to the left) 4, which is the lowest point on the dial.

Part of this is due to differences in sensitivity and to differences in the actual intensity of natural and artificial light: but in Kodachrome you must also compensate for the blue "Photoflood" filter. The action of this filter is to cut out some of the excess red and orange rays of the lamps, which, if we shot without the filter, would make our picture very red indeed. Since the filter simply stops part of the light, without putting anything in its place, we naturally have to increase the exposure to compensate for the filter.

The Weston engineers have also suggested a very different way of taking meter-readings when making Kodachrome scenes by artificial light. Instead of merely holding the meter up beside the camera, they advise holding it within ten inches of whatever part of the subject is of the greatest interest—the face, for instance, in close-ups. Take your reading with the meter in this position, being sure that the meter itself doesn't cast a shadow, which would affect its reading.

But, how much light are we to use: how many lamps? And how should they be arranged?

The most truthful answer to the first question would be simply, "as many as possible." The Eastman experts sum it up this way:

Normal Speed. (16 per/sec.)

Number of Photo-flood lamps and distance from lamps to subject.	f:1.9	f:2.8	f:3.5
2 at 3½ ft.		2 at 2¼ ft.	
3 at 4¼ ft.		3 at 3 ft.	3 at 2 ft.
4 at 5 ft.		4 at 3½ ft.	4 at 2¼ ft.

Half Speed. (8 per/sec.)

Number of Photo-flood lamps and distance from lamps to subject.	f:1.9	f:2.8	f:3.5
2 at 5 ft.		2 at 3½ ft.	2 at 2¼ ft.
3 at 6 ft.		3 at 4½ ft.	3 at 3 ft.
4 at 7½ ft.		4 at 5 ft.	4 at 3½ ft.

Experience in shooting Kodachrome outdoors should already have given a hint as to what type of lighting is best for color. Almost always, the best results will follow the use of a plain, flat front-light. This is doubly so when shooting interiors, for our artificial suns haven't nearly the strength of the natural one, and we must therefore "double up" if we are to avoid underexposing. Under such conditions, if we follow the rules of lighting for black-and-white, having one side of the face lit twice as strongly as the other, we would be very likely to lose the shadowed side of the face entirely, for shadows, in color, go very dark. So we go back to the most elementary lightings—flat and even, with the lamps as close to the center-line as possible without getting them into the picture, and with

(Continued on Page 452)

The World's Most Versatile 16 mm. Movie Camera



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And an unusual line of accessories further widens its scope. Among them are numbered an Electric Motor Drive for exposure throughout the unusually wide speed range of from one to sixty-four frames per second; a Lens Extension Tube Outfit for extreme magnification of minute objects without the assis-

tance of microscopes; an Optical Finder which can be calibrated for all focal length lenses from 15 mm. wide angle to 6-inch telephoto. This finder is provided with parallax correction down to 2 feet—therefore the correct field of all lenses can be indicated at all distances.

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The basic model is equipped with Kodak Anastigmat f.1.9 lens, 100-foot film chamber and set of six masks. Estimates for adaptation to any specialized work will be made upon request.

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A more detailed description of this remarkable camera is available upon request. Write for "Presenting Ciné-Kodak Special," a generously sized, copiously illustrated booklet. Address Eastman Kodak Co., Rochester, N. Y.



Set of Masks—Circle, oval, two vertical, and two horizontal half-masks are supplied with the basic model of the "Special." Other designs available.



Double Lens Turret—Facilitates instant change from a lens of short focal length to a telephoto. Exposure guide under each lens socket.



Single Frame Release—This feature, essential for successful animation, permits the exposure of a single frame every time the release is pressed.



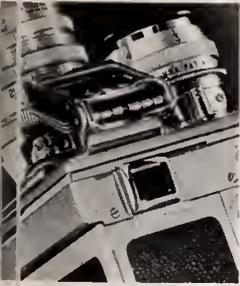
Film Meters—One meter registers the amount of film run or wound back. Another, on each film chamber, shows how much unused film remains.



Accessory Lenses—15 mm. f.2.7 wide-angle, 20 mm. f.3.5, 2-inch f.3.5, and 3-inch, 4½-inch, and 6-inch f.4.5 telephoto.



Variable Shutter—By fingertip command of des, lap dissolves, and other "trick" effects. Also for additional exposure control.



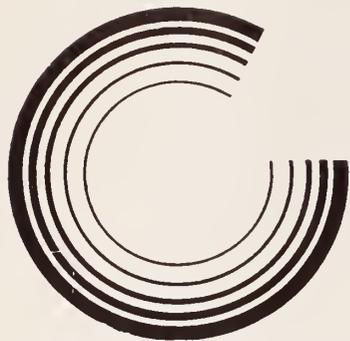
Reflex Finder—Shows a ground glass the exact focus and field, at any distance, with any of the seven lenses available for the Special.



Hand Cranking—Besides its spring motor drive the "Special" may be hand cranked by light- or one-frame shafts.



Film Chambers—100- or 200-foot film chambers enable you to change from one type of film to another without rethreading.



WHEELS OF INDUSTRY

Slow-Motion Checks Rough Riding

●How smoothness of riding for passengers of super-fast trains, of the streamline and other modern types, has been improved as the result of studies made by slow-motion pictures is an interesting story of American business and its use of scientific methods.

About a year ago, the Chicago, North Shore & Milwaukee Railroad, the high-speed electric line running between Chicago and Milwaukee, decided to conduct an investigation of truck oscillation or "nosing" — a transportation factor which, because of its contributing to uncomfortable riding, has become increasingly objectionable on all railroads as speed has been increased.

A slow-motion 16mm Bell & Howell motion picture camera was mounted in a box on a bracket on one corner of a truck which was guilty of nosing. Solenoid control started the camera after the car had reached a speed above 60 miles an hour, when noticeable nosing commences. The camera was focused on the lower part of the wheel where it contacts the rail, and pictures were taken of a worn wheel as found in service and then of a new replacement wheel. When the films were projected both the worn and the new wheel were seen to oscillate with a regular and continuous motion. The only difference noticeable in the movies of the two wheels was the less violent action of the new wheel due to the fact that this wheel had less clearance between flange and rail than did the worn one. This led to the belief that the oscillation was caused by the taper of 1 inch in 20 which has been a part of the standard design for railroad wheels.

On this belief, a set of wheels was turned without any taper but with the flange kept the same shape and size as formerly. Slow-motion pictures taken of these wheels showed no regular oscillation at all; in fact, the flange seldom impinged upon the rail on a straight track. The riding of the car was greatly improved, as there was no more nosing. The test car was put into regular service and watched as to wear of wheels and riding quality. The rails wore with some taper due to the wheels being worn that way by the standard

wheels, but slow-motion pictures taken after 30,000 miles showed only a slight tendency toward oscillation. This car is still in service and is being carefully watched, but the results of the test have been so conclusive that all new wheels and those re-turned are of the new type without a taper.

Says a Chicago, North Shore & Milwaukee Railroad official: "A number of railroad men from other lines have viewed the slow-motion pictures and have applied the principle to their equipment, especially in the case of the new streamlined trains, and greatly improved riding has resulted."

Burleigh Brooks Lenses

●The firm of Jos. Schneider & Company, lens manufacturers of Germany, represented in the United States by Burleigh Brooks, lately introduced several new photographic objectives, namely the Aero-Xenar, the Ortho-Angulon, and the Componor.

Aero-Xenar—As its name indicates, this is a six-element lens of the Xenar type with certain properties which render it the ideal objective for aerial photography. Spherical distortion and chromatic aberration have in this lens been brought down to an irreducible minimum. Aberrations inherent in the oblique rays have likewise been corrected, resulting in an anastigmatically flattened field over a comparatively wide angle. The aperture of the Aero-Xenar is $f\ 4.5$ and its focal lengths are 10", 11 $\frac{3}{4}$ ", and 19 $\frac{3}{4}$ ".

Ortho-Angulon—A wide-angle, spe-

cial, objective, particularly intended for photogrammetric work, that is, land survey, the making of relief maps, etc. It combines in unusually high degree corrections for spherical aberration and astigmatism, and is the last word in an apochromatic lens, thoroughly corrected for the complete gamut of spectral colors. It defines the subject sharply and without the slightest trace of linear distortion to the extreme edge of its angular field. Its aperture is $f\ 4.5$.

Componor—These $f\ 3.5$ and $f\ 4.5$ lenses are special flat field enlarging objectives for the amateur and professional photographer. They are well corrected for spherical aberration, color, coma, and astigmatism. They come in several sizes and are adapted for use with instruments with or without enlargers.

National Sound Splicer

●The National Cine Laboratories have perfected a splicer for the sound track on 35mm film that automatically cuts, places and cements an opaque patch across the sound track at the point of splice. The frequency of this patch at 90 feet per minute is said to be approximately 16 cycles and is therefore claimed to be inaudible. It is claimed this device eliminated the need of painting patches. The device is illustrated on this page.

University Uses Annual

●Doctor Boris Markovich, head of the School of Cinematography at the University of Southern California, has adopted the Cinematographic Annual volume 1 as one of his text books.

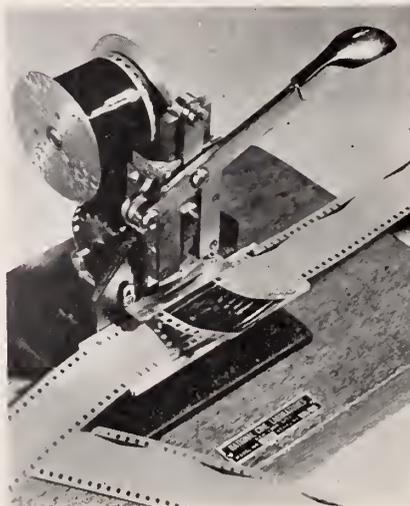
Doctor Markovich is using this volume because of its essential fundamental information, because of the authoritative nature in which it is presented and because it is the only work of its kind in existence, covering some phases of cinematography not covered in any other work.

This is the book which was recently reduced in price from \$5.00 to \$2.50.

Bell & Howell Releases

●Bell & Howell Company announces the release by its 16mm Filmound Rental Library of "Thunder Over Mexico," 7-reel feature talking picture produced by Sergei Eisenstein, noted Russian director. The University of Wisconsin has made arrangements for a long-term rental of

Continued on Page 458



A Few of the Many
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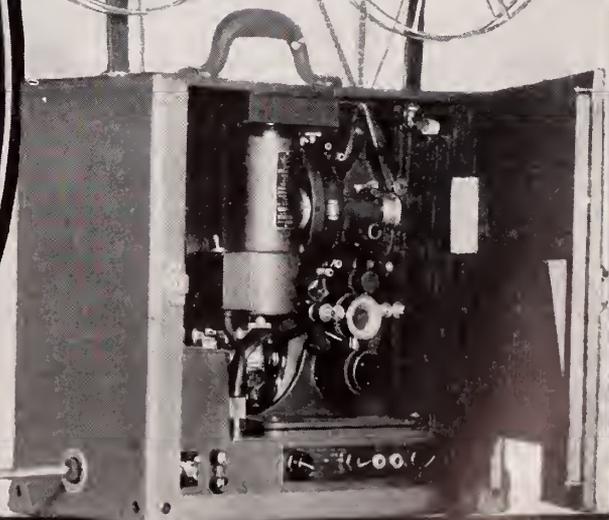
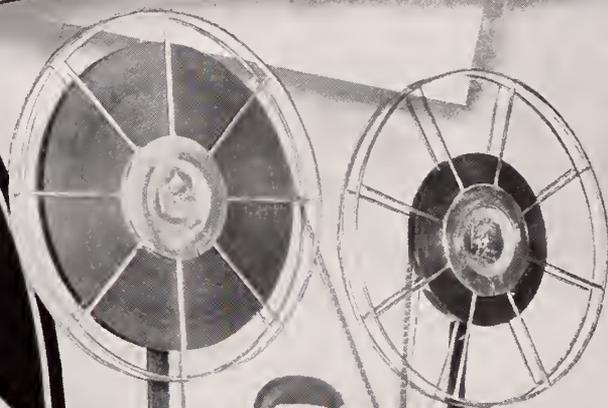
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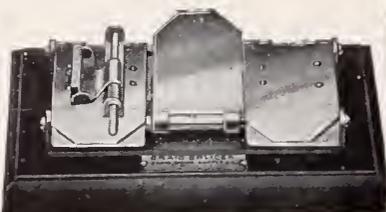


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When Kodachrome Comes Indoors

(Continued from Page 448)

the same number of lights, if possible, on each side of the camera.

At this point, the fellow who has done some black-and-white portraiture begins to think, "Well, I can spare a little here and there for modelling, can't I?" Not a chance—unless you have half-a-dozen or more lamps! Put them all on the one job of illuminating the subject's face, pumping them in one on top of the other, carefully checking to see that the 'hot spot' (or brightest part of the beam) from each light is right on the subject's face, and that all the beams are superimposed.

Once you've gotten that far, and your meter assures you that you've built up enough illumination for an exposure, then—and only then—can you begin to think about the rest of the scene.

The first thing, if you have any lights to spare, is to try to get some back-lighting. Back-light has to be intense—rather stronger than the front light, if it is to be effective—so your back-lighting lamp must be close to the subject. A spotlight, of course, is the perfect lamp for this. If you have one, use it, with the beam 'pulled down' as tight as you can get it. If you haven't a spotlight, press a reading lamp into service, slipping a Photoflood into its socket and putting it above, and slightly behind the subject. The same, of course, holds good for side-lighting. Once you know you have enough illumination to get a good exposure, and have arranged a nice back-light, you can, if you have any lamps left, use some of them to provide a side-lighting, letting the regular front-light take care of the shadows. In other words, follow the example of the professional Cinematographer, who first lays down a foundation of general light which assures his exposure, and builds up from that level to the high lights that give roundness and sparkle.

With all this light concentrated upon the person being photographed, what are we going to do about the background?

Well, the background will have to take care of itself, unless we have as many lamps as a Hollywood studio. Logically, we can 'cheat' a bit, by placing our subject close to the background—that is, to a wall, a tapestry, a bookcase, or the like. If we do this, the 'spilled light' which is, so to speak, left over from lighting the player, will show up some of the background. If we can slip a Photoflood or two into wall-fixtures, bridge-lamps, and so on, they will help a lot, though they can't be as

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MOVIE MAKERS CONTEST

Closes November 30th

ONLY A FEW DAYS LEFT

Here are the Rules---Read Them

The Contest is open only to Amateurs. No professional cinematographer will be eligible to compete.

The Contest ends at midnight of November 30th, 1935. All pictures must be received by the closing date or they will not be considered.

Pictures Submitted in this contest will be judged for photography, composition, direction, acting, editing and entertainment value. The judges will include outstanding and widely known cameramen, directors, actors, writers and a group of nationally known motion picture critics.

The Decision of the judges will be absolutely final and there can be no appeal from their decision. Announcements of the awards will be made as soon after the close of the contest as possible and checks and prizes will be sent the winners.

Pictures may be submitted either by individual amateur cine filmers, or they may be submitted by amateur

movie clubs. They must be photographed on 16mm or 8mm film. Each entrant must have his entry accompanied by the entry blank which will be sent him on request to fill out. No pictures will be accepted which were photographed on 35mm film and then reduced.

Contestants may enter as many subjects as they desire. One entry blank will cover all subjects placed in the contest by that entrant.

The Contest is open to amateurs and amateur clubs anywhere in the world.

The American Cinematographer reserves the right not to declare a prize for any classification, if in the opinion of the judges there is not a picture submitted sufficiently good to be classed as a prize-winner.

The American Cinematographer also retains the right to make duplicates of such prize-winning pictures as it may indicate for free distribution to clubs and amateur organizations throughout the world.

If you intend to enter the contest send at once for entry blank to

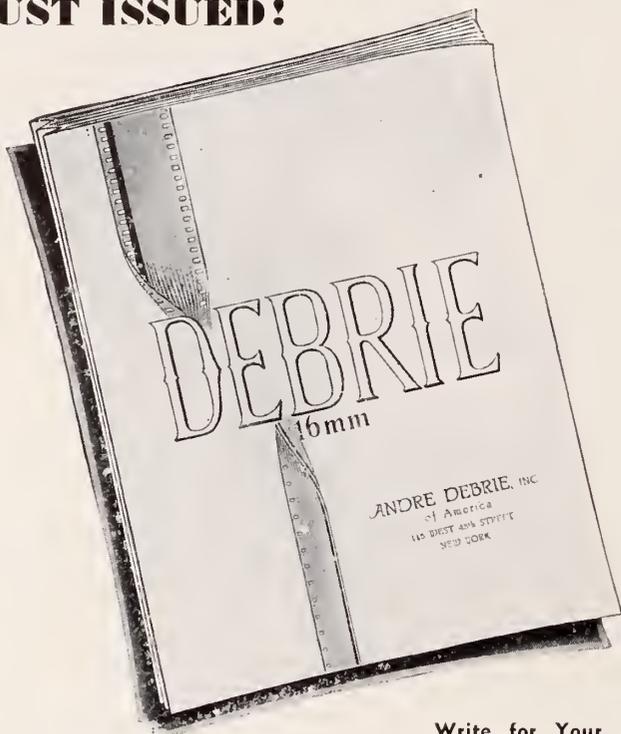
Contest Editor

American Cinematographer

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in a sunny room, with the natural light 'boosted', if necessary, by your photo-flood units, will give you still another field of interesting activity—and beautiful pictures, to boot.

Save It With Added Scenes

(Continued from Page 445)

film came back from the processing-station, it seemed to be a good deal more landscape than honeymoon: and though the landscapes were nice ones, still, they didn't afford much of an indication that my wife and I had been bride-and-grooming it in the vicinity. So I bought another hundred feet of film, and selected a handy bit of hillside that could double for some of those shown in the landscape long-shots. My wife and I put on the same clothes we wore in the few scenes we'd appeared in, and set forth to make our 'added scenes'. Here, I made a close-up of her, with a bit of bare hillside in the background—there, another, framed under a pine branch—again, she took the camera, and shot me (against a non-committal background) busily plying my still-camera; then, we set the camera on its tripod, and got several good close shots of the two of us together, wearing properly beatific expressions. A few days later, I finished the roll with some shots of myself—always against diplomatically unobtrusive backgrounds

—putting suitcases into and out of the car, brushing rice from my hat-band, and so on. The results were just what the picture needed to provide a complete record of the honeymoon: loading the baggage into the car—the church, the wedding party—a long-shot of the car on the highway—the actual landscapes, introduced by close shots in which we admired the view, or made stills of it, or merely beamed ecstatically at one another—unloading the car—that shot we made of the hotel—and so on down to the finish and my bit of business with the rice. And no one who has seen the picture so far has even guessed the trick by which we achieved the completeness they've so admired!

One of my friends, who lives in an inland city, salvaged the films of a trip to Hawaii by the same method. He couldn't duplicate the tropical foliage of Honolulu in his home city—so he chose his angles in such a way as to provide a background of sky and clouds for every added close-up. Choosing his weather carefully, he planted his people on hilltops, where he could shoot up at them without having to use unnatural angles. Waikiki beach scenes, for instance, were made in this manner, with the aid of a bathing-suit and a bucket of water dashed over the victim just be-

efficient as they would be in proper photographic reflectors.

Another way we can help the lighting is by selecting light-colored backgrounds. They will naturally show up better, for dark walls lap up light the way a cat laps up milk.

It's rather a question whether, in color close-ups, dark, unobtrusive backgrounds aren't more desirable, as they tend to make the subject stand out more brilliantly. One of my best Kodachrome shots was a head-and-shoulders close-up of a girl in a blue dress, against the background of a brown sarong; the background was all but lost in soft, mysterious shadows, and was revealed only occasionally when some of my side-lighting strayed over to outline the folds in the draped sarong.

Likewise, it's a good thing to make the colors of the victim's costume help your shot: darker clothes will naturally eat up light, and be less brilliant than lighter shades; and greens, which are the weak point of any subtractive color-process, should be avoided wherever possible.

Lastly, let old Sol help you out with your lighting! Shooting color-interiors

Britelite Truvision

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fore the camera started; a night-effect shot made on the boat was matched by an interior scene made against a flat, dark curtain, illuminated by a spotlight reflected from a panful of water, which gave rippling reflections across the faces!

It is often possible to "double" people, too. Suppose you made a trip to Europe, and met some interesting person. You got some good shots of him—but you neglected to get any of yourself with him: and to prove to the folks back home that you actually hobnobbed with a 'highness', you ought to have at least one shot of the two of you together. Well, there are two sides to everything—even to a "highness." You have a shot of his face (front elevation, as the engineer says): if you cut next to this shot one of yourself, with a bock, clad similarly to the royal personage's, in the foreground, and let the action suggest that you were snapped during an animated conversation, your audience will leap to the conclusion that the two shots were made at the same time. All you will have to do will be to get someone of approximately the right size and build to stand in the foreground, wearing clothes that resemble those the other shot shows draped around the distinguished figure, and—always this!—shoot the scene against a properly vague background. If your "added scene" is made well, and the cutting done expertly, you are bound to get the desired effect. Incidentally, the idea will work quite as well to suggest the school-teacher from Keokuk you met on the boat!

On the other hand, another of my friends works on exactly the opposite plan. He concentrates on getting the actual, intimate close shots of the people he meets during his travels. He shoots these in great profusion—and lets the scenic shots, as a rule, take second place. In most places, he reasons, he can buy commercial films of such scenic views, made, as a rule, rather better, and under more ideal conditions, than he could photograph them himself: but he can't buy close-ups of his fellow voyagers. So he shoots the scenes he can't buy, and buys those he can obtain commercially. When the two are intercut skillfully, he has a genuinely complete record of his trip in all its phases—made more easily and cheaply than could be done by any other method.

After all, the beauty of motion picture-making is the fact the audience can judge what it sees on the screen only by what has gone before and what comes after. Neither time nor space exists for the cine-camera: the only limiting factors are the skill and ingenuity of the man behind the camera!

CANDID NEWS

NEW

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Model G.



Model G with f:2 Summar Lens.

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Clubs Show Prize Pictures

The Medford Amateur Movie Club is scheduling a special meeting for the showing of the American Cinematographer 1934 Amateur Movie Prize Winning pictures.

The pictures included in this showing are two 16mm subjects and two 8mm pictures. The 16mm subjects are "Water," made by H. Demarest of New Jersey, and "Mischief," made by Van-Dee Sickler of Los Angeles. The 8mm subjects include the grand prize winner "New Horizon," made by R. B. Clardy of Los Angeles, and the photographic winner, "Tender Friendship," made by

Leica Manual

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AT THE

Morgan Camera Shop
6305 Sunset Blvd., Hollywood, Calif.

Tatuschi Okamoto of Japan.

During the month of October the well known Metropolitan Club of New York City will schedule a special program for the showing of these same pictures.

During the past year about 30 clubs have made these pictures a feature part of their meetings.

Reversible Film for Miniature Camera

(Continued from Page 447)

for SPORT AND Travel HUGO MEYER Telephoto LENSES



That distant object seen by the naked eye as a mere spot on the horizon—that scene at the races with the horses bunched at the far side of the field and your favorite in the lead—that football match when the play is fast and close and it is hard for even the expert eye to follow the ball—these and many other subjects are best captured with Hugo Meyer Telephoto Lenses whose powerful magnification and needle-sharp definition reveal, in infinite detail, vague distances imperceptible to the naked eye.

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Tele-Megor f/4 and f/5.5
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Kin-O-Lux film is stabilized at the lowest possible price consistent with good quality. It is the only film that is Scratch-Proofed by the TEITEL Process without cost, rendering it immune to deterioration consequent on time, use and the elements.



No. 1 Green Box 100 ft. \$3.00; 50 ft. \$2.00.
No. 2 Red Box 100 ft. \$3.50; 50 ft. \$2.50.

Prices include Processing, Scratch-Proofing and Return Postage.

SEND FOR CATALOG D

KIN-O-LUX, Inc.
105 West 40th Street New York City

The New 16mm PANCHROMATIC NEGATIVES

(Eastman, Agfa, Dupont)

will surprise you with their fine quality, their beautiful tones and grainless reproductions, if you have them developed by the

**DUNNING GRAINLESS METHOD
DUNNING PROCESS COMPANY**

932 N. La Brea Avenue
Hollywood, Calif.
(35mm reduced to 16mm)

them a better conception of each picture as it will be enlarged, and saving him the time and cost of making so many proofs.

Many photographers like to work with paper negatives. Time saving and more perfect negatives will be the result of using the new reversible film, as the paper negative can be made by direct enlargement of the positive image. Alterations may now be made upon the paper negative as upon film. Paper negative prints are popular because of the interesting textures which may be accomplished by this method. Contact papers may be used for printing, offering a variety of choice.

The making of photomurals is a new field which is just beginning to achieve universal notice and popularity. Photomurals lend themselves to home and office decoration and have many possibilities for the exhibition of industrial processes. More and more Leica photographers are becoming interested in photomurals. Through the use of reversible film and large negatives made from it, they should be confident of success. Nevertheless, there is an enlargement of about three and one-half by five feet made by direct enlargement from an Agfa Finopan negative shot with a Leica camera. The use of the reversible film, however, would give one the choice of retouching if necessary.

As time passes miniature camera users will probably find dozens of other uses for this new film. In any case several of the present problems of miniature photography may find solution through the use of reversible film. Reversible film has become the accepted thing for 8 and 16mm amateur movies. In the wide field of miniature camera work it will probably become standard procedure for certain special uses.

Formula for Reversing AGFA Superpan Reversible Film:

1. First Developer.

Solution A

Water (125° F. or 52° C.)..... 24 oz.
(750.0 cc)
Methol 29 gr.
(2.0 grams)
Hydroquinone219 gr.
(15.0 grams)
Sodium Sulphite (desiccated)292 gr.
(20.0 grams)
Sodium Bisulphite 73 gr.
(5.0 grams)
Sodium Thiosulphite (Hypo)..... 73 gr.
(5.0 grams)
Formaldehyde (40%)1¼ fl. dr.
(5.0 cc)
Water (cold) to make.....28 fl. oz.
(900.0 cc)

Solution B

COLD Water 4 oz.
(100.0 cc)

Sodium Hydroxide (Caustic) .365 gr.
(25.0 grams)

Pour Solution B into Solution A while stirring. Depending on exposure development 4 to 6 minutes at 65° F. or 18° C.
2. Wash 5 minutes in running water.

3. Reversing Bath (B'each).

Water32 oz.
(1000.0 cc)

Potassium Bichromate73 gr.
(5.0 grams)

Sulphuric Acid (concentrated) .. 1¼ fl. drams (5.0 cc)

Normal bleaching time: 3-6 minutes. Keep in bleaching bath until negative image is completely dissolved.

4. Wash 5 minutes in running water.

5. Clearing Bath.

Water32 oz.
(1000.0 cc)

Sodium Sulphite, dry.....1-2/3 oz.
(50.0 grams)

Clear for 5 minutes.

6. Wash 5 minutes in running water.

7. Expose to Mazda light or diffused daylight.

8. Second Developer.

Water at 125° F. or 52° C..... 32 oz.
(1000.0 cc)

Methol73 gr.
(5.0 grams)

Hydroquinone88 gr.
(6.0 grams)

Sodium Sulphite, desiccated ..1-1/3 oz.
(40.0 grams)

Potassium Carbonate1-1/3 oz.
(40.0 grams)

Potassium Bromide88 gr.
(6.0 grams)

Develop 5 minutes at 65° F. or 18° C.

9. Short rinse in running water.

10. Fixing Bath.

Same Fixing Bath may be used as for other Leica Films. If one is not available the following may be prepared:

Water32 oz.
(1 liter)

Hypo10 oz.
(300.0 grams)

Potassium Metabisulphite1-2/3 oz.
(50.0 grams)

(Sodium Bisulphite may be used instead of Pot. Metabisulphite weight for weight. It's cheaper and just as effective.)

Fix for 2 minutes.

11. Wash for 30 minutes in running water.

12. **Glycerine Bath.**

- Glycerine C.P.2/3 oz.
(1 liter)
 - Glycerine C.P.2/3 oz.
(20.0 cc)
- Leave in glycerine bath for 5 minutes.

13. Remove excess water with Viscose Sponge or chamois and dry in a current of warm dry air.

NOTE: Operations 7-13 take place in ordinary white light. Superpan Reversible Film should be desensitized before development by immersion in a 1:5000 solution of Pinacryptol Green Desensitizer. Safelight Filter to be used for protection of Agfa Reversible Superpan with a 10-watt bulb: Agfa No. 103. (Taken from LEICA MANUAL—Morgan & Lester, p. 127.)

Some Unusual German Substandard Apparatus

(Continued from Page 446)

which makes them very quickly changeable, and while in other cameras the finder must be altered to compensate for the difference in focal length, in the Siemens D the finder is automatically changed to give the right field of view. This is arranged by a mechanical coupling between the three finder lenses and the lens slide.

Just in the same way as with the cameras, substandard film projectors have tended to become stereotyped in design. Some German designers, however, have gone their own way, and turned out some interesting and useful apparatus.

Most substandard projectors, for instance, follow camera design in moving on the film by claw action. But the first German substandard projector that came on the market, made by Geyer-Werke, used the standard maltese cross action. The system of using maltese cross and drum action was perfectly sound, even though lack of experience of substandard films was rather evident in the construction of this machine. Among the modern German substandard projectors, though, the portable projector of Bauer uses the maltese cross and drum; the Gigant projector of the Union - Tonfilmmaschinenbau - und - Vertriebsgesellschaft m. b. H. has a modified maltese cross action; and manufacturers in other countries are also beginning to consider the use of the same device. The latest Litax models ("Piccolo" and "Super-P") have a sprocket action for moving on the film, while the Siemens projectors have an ingenious dog action that does not touch the sprocket-holes, but pulls down the film by pressure on the outer edges. This gives a short pull down and a remarkably steady picture, combined with a commendable absence of wear on the film. Devices for protecting the projector against improper handling are also found on many German machines. The Siemens projector was the first to include automatic coupling between the resistance and the projection lamp, but the action has since been incorporated in the machines of a number of other makers. The Siemens projector only lets the lamp be turned on when the resistance is fully in circuit. This projector al-

so has a mechanical link between film gate, speed regulator, and reversing switch, so that when the film is moved backward through the machine, the gate opens automatically to release the drag on the film, and the speed of running is automatically increased.

The recent increase in light flux from substandard projectors was first sponsored by the German makers. The Siemens machine does this by alterations to the optical system of the lamp, and by the special large-aperture projection lens. The new Union-"Gigant" model is the first to use a mirror-backed lamp, which throws the filament image on to the film gate, and to incorporate a drum shutter that cuts off the light both in front of and behind the projection lens.

Alteration of the shutter from two to three blades is quite a common feature of German substandard projectors. This possibility of changing the shutter blades makes it easy to adapt the projector to the particular use that is made of it. The Siemens projector introduced the system of interchangeable shutter blades that could be altered without special tools or expert knowledge while such machines as the "Argus" made by Liesegang and the Lytax and "Movector" of Agfa, have shutters that may be changed from two-bladed to three-bladed or one-bladed to two-bladed respectively merely by pressing a button and moving the blades over each other. The Agfa-"Movector" also has a shutter speed of twice normal, so that four dark periods per picture are obtained.

Two interesting mechanical novelties may be mentioned in conclusion. The fight between the various substandard film sizes has led to the Nizo firm designing their projectors so that the projection head is interchangeable, and may be had for four different film sizes.

Secondly, advertising films, which are ordinarily used with continuous projectors, need no longer be made up in loop formation. The Siemens standard projector can be supplied fitted with a device which runs the film through, rewinds it, and projects it once more. The action goes on until the current is switched off.

Like all thoroughbreds, I have the goods. Precisely made . . . aluminum die cast body . . . phosphor bronze bearings . . . silent gears . . . automatic high speed rewind . . . forward and reverse . . . still pictures . . . and light—plenty of it—my economical long life 400 watt Biplone Moxdo is equal to 500 watt results.

Buy me on trial and judge for yourself. A thoroughbred projector at a price you can afford to pay.

Your \$99.50 cheerfully refunded if not satisfactory after ten full days trial in your own home. Complete with case. Order now.

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179 W. Madison St., Chicago

Camera Headquarters for Tourists

What Is Composition in Cinema?

(Continued from Page 444)

Another type of film that has great possibilities is the "Frozen Action." Just try taking action shots and freezing them at the dynamic movement. You will be surprised how humorous and unusual they will appear. The sequences should be related actions and for comedy you can resort to slow motion just as the action is ready to "freeze."

Next month I hope to take each "structural form" and break it down into its relation to the camera. Study this and you will be surprised how simple it is to fit it to your motion picture script.

Wheels of Industry

(Continued from Page 450)

the film; Northwestern University opened its summer school motion picture appreciation program with this same subject; and arrangements were immediately completed for distribution in Great Britain.

Additional current releases by this progressive 16mm sound film rental library include a 2-reel adventure picture "N'Manga," an educational picture of native life in Central Africa, centering around the efforts of a master hunter to capture the rarest of African partridges, the Frankolin. All the preparations for the peculiar hunt are pictured in detail, and the picture as a whole gives an interesting insight into native life, such as is generally lacking in the "tourist" type of film.

"The Masked Raider" (2 reels), a children's picture, and of interest to all lovers of the out-of-doors, is another worthwhile release, as is "South Seas" (1 reel), an additional chapter from Zane Grey's Scrapbook.

New Leica Manual

●The descriptive line under the title of this book on its credit page says "A Manual for the Amateur and Professional covering the entire field of Leica Photography." The authors, Willard D. Morgan and Henry M. Lester, might have gone one step further and said in addition to Leica Photography "all photography."

To benefit from this comprehensive volume one doesn't necessarily have to be solely a Leica user. If you shoot any type of camera the information it will give you will be applicable in 75% of the cases.

The book has more than 500 pages and sells for \$4.00. Morgan and Lester, the authors, are also the publishers.

In addition to the two authors there

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Eastman 100 Kodachrome \$6.60. Motor Projector \$19.50. Victor Sound Projector with amplifier \$89.50. Trades accepted. We buy. Catalogue. Library. Mogull's, 1944-Y, Boston Road, N. Y.

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2 Akeley Cameras, Modern Studio equipment. Late models. Full range of lenses. Prices \$850.00 and \$950.00. Camera Supply, Ltd., 1515 Cahuenga Blvd., Hollywood, California.

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are 20 other outstanding contributors of articles and special photographic subjects.

The book is divided into three parts. Part one is given over to Technique, Part two the Leica in Science and Education and Part three the Leica in Specialized Fields. This latter field has some very interesting chapters that will appeal to everyone, such as Candid Photography, Stage Photography, Hollywood Studios, Aerial Photography, Photography in the Tropics and Photomurals with the Leica.

When we say that it takes up Panorama Photography, Stereoscopic Photography and illustrates the method to secure this type of photography in addition to a lucid word description, it can readily be understood that this is not a book to be picked up, skipped through and then put aside. It will be referred to

ARTREEVES latest 1935 portable double sound recording unit with double sprocket recorder, automatic speed control motor, twin fidelity optical unit. Latest type camera motor. New type microphone. Complete factory guaranteed, \$2,400. This is the only authentic ArtReeves equipment for sale in Hollywood outside factory. Slightly used ArtReeves sound equipment complete \$1,800.00. Camera Supply Co., Ltd., 1515 Cahuenga Blvd., Hollywood, Calif.

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230-Jegree shutter Akeley Camera X134, special focus on film attachment, 2-, 4-, 6-, and 12-inch lenses. Four 200-foot magazines, Akeley tripod, cases. Motion Picture Camera Supply, Inc., 723 Seventh Ave., New York City; Cable: CINECAMERA.

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Akeley Audio Camera any condition; Akeley Gyro-Tripod and Model L DeBrie Camera. Len H. Roos, 903 Kenwood, Burbank, California.

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constantly for its common-sense instructions, its comprehensive dark-room information and the many things it offers for those who want to get a full measure of enjoyment out of photography.

Victor Moves

●Victor Animatograph Corp. has moved their Los Angeles offices from the downtown sector to 2402 W. 7th St., which is about a mile and a half outside of the shopping center, making parking facilities much better for the dealer coming into Los Angeles.

The quarters selected by Carl Rakle, manager of the Los Angeles offices, are more commodious and on the store floor. The arrangements not only give a commodious display room, a repair department, but also a projection room.

Amateur Movie Contest



The annual American Cinematographer Amateur Movie Contest will close this year on November 30. That is, all entries must be in our office on that date.

As usual the members of the American Society of Cinematographers will act as judges.

There will be four outstanding prizes. None worth less than \$150.00.

THE GRAND PRIZE will be.....\$250 cash
EASTMAN KODAK CO. offers.....\$150 in Equipment
BELL & HOWELL offers.....\$150 in Equipment
VICTOR ANIMATOGRAPH offers a Model 4 Camera complete
with f 2.9 Focusing Mount, 1" Lens and a No. 1 Carrying Case,
value\$147

It isn't too late to start your picture now if you haven't already done so. It can be in as many reels as you wish, it can be either 16mm or 8mm. Write for more information and Entry Blank.

CONTEST EDITOR
AMERICAN CINEMATOGRAPHER

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CAMERICAN CINEMATOGRAPHER

The Motion Picture CAMERA Magazine

November,
1935

Published in Hollywood,
by
American Society of
Cinematographers



this issue

Color in Still Photography
Arc Lights Used on Large Sets
Walker Accents Mood . . .
Photography in "Midsummer"
the Star
. . . and other features

25c

an Harlow and William Powell in
"RECKLESS"
 Franchot Tone, May Robson, Ted
 Healy, Robert Light 96 mins.

G-M
**CATCHY DANCE AND SONG NUM-
 BERS CLEVERLY MIXED WITH COLO-
 UL ROMANCE IN DRAMATIC STOR-**
 Producer, David O Selznick, Direc-
 Victor Fleming, Author, Oliver Jeff-
 Screenplay, P J Wolfson, Musical
 bers, Jerome Kern, Con Conrad,
 King, Editor, Margaret Booth, Cameraman,
 George Folsey
 Direction, Expert Photography, Excellent

"JALNA"
 (HOLLYWOOD PREVIEW)
 RKO Radio
**FAIR CLASS DRAMA HANDICAP-
 IN GENERAL APPEAL BY UNSU-
 THETIC LOVE MIXUPS** 77
 Producer, Kenneth Macgowan, D
 John Cromwell, Author, Mazo de la
 Screenplay, Anthony Veiller, Garret
 Larry Bachman, Cameraman, Edward Cron-
 jager, Editor, William Morgan
 Direction, Best possible Photography, A-1

with ZaSu Pitts, James Gleason
 RKO Radio
"HOT TIP"
**NICE BALANCING OF HORSE RACE
 THRILLS AND COMEDY WITH PITTS
 AND GLEASON GOING OVER STRONG.**
 Producer, William Sistrum, Directors, Ray
 McCarey, James Gleason; Screenplay, Hugh
 Cummings, Olive Cooper, Louis Stevens,
 Mackenzie
 Editor, James Morley, Cameraman, Jack
 Direction, Very Good Photography, Ex-

W. C. Fields in
**"THE MAN ON THE FLYING
 TRAPEZE"**

Mary Brian and Kathleen Howard
 65 mins.
**SING COMEDY WITH MORE EM-
 S ON GAGS THAN ON STORY**
PLEASE THE W. C. FIELDS FANS.
 ned straight at the W. C. Fields clien-
 this production will supply his follow-
 with an ample quota of laughs evoked
 the gag route. Otherwise the picture
 thin on story and rather short on cumu-
 lative suspense. What there is of plot
 concerns the nagging of Bill Fields by his
 wife and a couple of in-laws, while his
 daughter, Mary Brian, sticks up for him.
 On top of that, climaxing a series of
 troubles, he loses his job because he used
 the mother-in-law funeral gag in order
 to get an afternoon off—which inci-
 dentally results in an avalanche of flowers
 and sympathy being sent to his home, with
 Bill gets his job back, because his mem-
 ory system is indispensable at the office.
 He also finally squelches his family and
 becomes the real head of the house.
 Cast: W C Fields, Mary Brian, Kath-
 leen Howard, Grady Sutton, Vera Lewis,
 Lucien Littlefield, Oscar Apfel, Lew Kelly,
 Arthur Aylesworth, Tammany Young, Wal-
 ter Brennan, Harry Ekejian, Torr Johnson,
 David Clyde,
 Producer, William LeBaron, Director,
 Clyde Bruckman; Authors, Charles Bogle,
 Sam Hardy; Screenplay, Ray Harris, Sam
 Hardy; Cameraman, Al Gilks, Editor, Rich-
 ard Currier.
 Direction, Good. Photography, A-1

Greta Garbo and Fredric Ma
"ANNA KARENINA"
 M
**FINE PERFORMANCES BY GAR-
 DRIC MARCH PUT THIS C
 ESSIVELY**

A very fine presentation of
 classic with Greta Garbo in a sy-
 le that fits her admirably. Fred-
 ric March is superb in the role of
 Vronsky, the officer for whose love she desert-
 ed and child. Both handle their parts
 with a fine appreciation of the poignant
 drama with all its subtle evaluations. Tol-
 stoy's novel is adhered to closely, and
 Garbo has never appeared more human and
 appealing. She also photographs wonder-
 fully well. Clarence Brown has given
 direction with consummate skill, and with
 the help of a very clever script, has given
 this old romantic drama of the Czarist
 regime a modern interpretation without in-
 any way destroying the authenticity of the
 classic original or taking any undue liber-
 ties. The settings are superb, and the
 usual Metro attention to authentic detail
 is evident throughout the production. The
 play ends with Anna Karenina leaving the
 city on a train that departs shortly after
 she had rushed to the depot and missed
 a last fond farewell to the man for whom
 she had sacrificed everything.
 Cast: Greta Garbo, Fredric March, Fred-
 ric March, Maureen O'Sullivan, May
 die Bartholomew, Maureen O'Sullivan, May
 Robson, Basil Rathbone, Reginald Owen,
 Reginald Denny, Phoebe Foster, Gyles Is-
 ham, Buster Phelps, Ella Ethridge, Joan
 Marsh, Sidney Bracey, Cora Sue Collins,
 Joe E Tozer, Guy D'Ennery, Harry Allen,
 Mary Forbes, Ethel Griffies, Harry Beres-
 ford, Sarah Padden
 Producer, David O Selznick, Director,
 Clarence Brown, Author, Count Leo Tol-
 stoy, Screenplay, Clemence Dane, Salka
 Viertel, Editor, Robert J Kern, Camera-
 man, William Daniels
 Direction, Excellent Photography, The
 Best

Sylvia Sidney and Herbert Marshall in
"ACCENT ON YOUTH"
 with Phillip Reed, Astrid Allwyn,
 Ernest Cossart 77 mins.

Paramount
**PLEASE ROMANTIC COMEDY
 CHIEFLY FOR ADULT TRADE, WITH
 MARSHALL AND COSSART SCORING**
 Producer, Douglas MacLean, Direc-
 Wesley Ruggles, Author, Samson Raf-
 son, Screenplay, Herbert Fields, C
 Binyon, Cameraman, Leon Shamroy,
 Otho Lovering
 Direction, Nice Photography, A-1

with Bieg Crosby, Joan Bennett
 Paramount
"TWO FOR TONIGHT"
**SPRIGHTLY COMEDY-ROMANCE DON
 WILL DELIGHTFUL KIDDING AIR THAT
 WILL PLEASE THE FEMMES.** 61 min
 Director, Frank Tuttle, Authors, Max
 Lief, J O Lief, Screenplay, George Marion,
 Jr, Cameraman, Karl Struss
 Direction, Very Good Photography, Ex-
 cellent

"THE DARK ANGEL"
 with Fredric March, Merle Oberon,
 Herbert Marshall
 United Artists 1 hr., 50 mins.
**SPLENDID PRODUCTION WITH THREE
 STELLAR PERFORMANCES SCORES IM-
 PRESSIVELY.**
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 Trevelyan, Screenplay, Lillian Hellman,
 Mordaunt Shairp, Editor, Sherman Todd,
 Cameraman, Gregg Toland
 Direction, Excellent Photography, The
 Best

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Philip M. Chancellor, A.S.C.

EVERY system of natural-color photography consists fundamentally of a means of separating the image into black-and-white images selectively filtered to represent the primary color components, and then recombining the resultant positive prints, colored either additively or subtractively, to form the final natural-color picture. The actual methods used to do this naturally vary a great deal; but both the end sought, and the underlying principle are always essentially the same.

Probably the earliest successful process for color reproduction is the "screen-plate" principle, which was conceived in 1867, put into practical application in 1892, and is still used with considerable success. It combines a rare theoretical appeal with very beautiful results, though in practice it is generally limited to the production of transparencies. In a conventional three-color, additive process, three separate negatives are made through as many filters, and the three positive transparencies resulting are viewed superimposed, each illuminated through its appropriate filter: in the screen-plate process, the three filters are combined in a mosaic pattern on the plate itself.

The screens fall into two categories: granular and ruled. In the first, the screen is made of a mixture of minute colored grains, and is consequently irregular in form. In the second, the screen is a regular pattern of finely ruled colored lines. Where a granular screen is used, the negative must be reversed to form a positive transparency; where a ruled screen is employed, the regular pattern permits having the screen as a separate unit, so that any number of positive transparencies may be printed, each of which when bound together with a ruled viewing screen will form a perfect color picture.

The granular type of screen is composed of minute starch or resin grains which have been carefully weighed, dyed with the proper, stable dye, mixed in the proper proportions, and flowed upon a plate. They are then rolled under great pressure until the grains overlap each other, and thus form minute filters in a mosaic pattern. The

Practical

careful weighing and mixing assures that approximately correct proportions of the three colors will be coated and evenly distributed about the plate. The color must be very intense to assure sufficient absorption of light in a coating only 15 μ in thickness. There are between 3,000,000 to 4,500,000 grains per square inch. In spite of all efforts to mix the grains thoroughly, it is actually impossible to avoid clumps of grains which are sometimes visible under even slight magnification.

The screen itself is a neutral grey when viewed by ordinary transmitted light, and appears white when viewed by light of sufficient intensity. Onto this mosaic screen, a thin panchromatic emulsion is coated. Obviously, in use the plate must be turned around in the holder, and the exposure made through the back or glass side of the plate, so that the screen may come into action. For this reason, the focus must be compensated either by racking the lens inward the thickness of the plate, or by using a compensating filter such as the Zeiss "Dukar."

After exposure, the plate is developed, and then reversed. The reason for this is apparent when we follow the operation of our mosaic screen in filtering the light. Light from a yellow object is absorbed by the blue grains, but passed through the red and green grains, bringing the emulsion behind these colors into a developable condition. Likewise, light from a red object is absorbed by the blue and green grains, but can pass freely through the red grains to affect the silver bromide behind them. If the plate were developed and not reversed, a yellow object would appear blue-violet, while a red object would appear greenish, thus producing a twofold negative, both the monochrome renderings and the colors being reversed.

By reversal and redevelopment we correct this condition. By dissolving away portions which appear dense in the negative, and darkening portions which are clear on the negative, we not only produce a positive image, but permit light to pass through the same color areas it originally did. Silver density of varying proportion behind each tiny filtering grain controls the color-transmission, and gives the effect of color over the whole plate.

Theoretically, this is the ideal solution, since the same filters used in taking are also used in viewing. It would be the final solution for pure color were it not for the facts that it is very difficult to reproduce such plates, and absolutely impossible to avoid grouping and clumping of the grains.

Commercially, this process is readily available in the Agfacolor plates and the Lumiere Autachrome plates, and, more recently, coated upon cut, roll and pack film as the Ultra-Agfacolor film and Lumiere Filmcolor.

In order to avoid the clumping inevitable in granular screens, attempts have frequently been made to rule lines on a suitable base, dye these by turns in the three primary

Aspects of Natural-Color Still Photography

by
Philip M. Chancellor, A.S.C., F.R.G.S.

colors, and thus produce a mosaic pattern of unvarying regularity. This is a difficult and expensive matter, but several processes have been developed in which it is achieved with success. Foremost and newest of these regular ruled screens is the Dufaycolor process, which utilizes celluloid film instead of plates. The Dufay screen is ruled through a most complicated process, and provides 500 lines to the inch, forming a geometrical pattern of squares in the three primary colors.

The regular ruled screen is also used in such duplicating processes as the old Paget and Duplex, and the more modern Finlay plates. In these processes, the screen is a separate unit, and as it is of mathematical regularity, any number of positives may be printed from the original negative and when bound with identical color screens, will give perfect duplicate transparencies. Here again, however, there are drawbacks, the most common being parallax and the difficulty of registering the plates.

Transparencies are naturally limited in their application. Aside from the purely physical factors which limit their commercial utility, there are considerable problems in making reproductions from them by the photo-engraving processes used in book and magazine reproduction as there is generally an objectionable conflict between the patterns of the color-plate screen and that used by the engraver. It is possible, however, to make a set of separation negatives from a transparency. The procedure is generally to place the plate in contact with the negative, and to expose it to the light of a standard length of magnesium ribbon, or an arc lamp. Three exposures are made, on three negatives, each exposure being made through a special set of narrow complementary filters. Reproduction from screen plates is at best unsatisfactory if perfect results are desired, for while vigorous tones may be obtained, the softer tones and yellows are almost invariably lost.

Clearly, the ideal in natural-color photography is a colored print on paper, comparable to our conventional black-and-white prints. Until the time when a monopack emulsion like that of the Kodachrome cine process can be adapted to still work, all paper positive still work must work from the foundation of a set of three separation negatives and achieve its end with some method of subtractive printing. Naturally, the best reproductive process is me-

chanical printing from a set of engraved copper plates: but except for magazine reproduction, this is far too costly, as it necessitates extremely accurate photoengraving and printing. None the less, the same essential principle is employed in most of the really successful processes of securing natural-color prints on paper. For this part of the discussion, we will therefore assume a set of three-color separation negatives to have been made, without inquiring into how these negatives were obtained.

No doubt the most widely known color printing process in use is the superimposed Carbon transfer. The carbon transfer has always been a print of lasting and rare beauty, and it is really unfortunate that the Monochrome Carbon transfer process has been so sadly neglected. Even though carbon is no longer the pigment used, the name still identifies the process, which for our purpose has become the Three-Color Carbon Transfer.

In brief, the process is as follows: gelatin, impregnated with a pigment insoluble in water, is thickly coated onto paper. These sheets are then sensitized with a bichromate sensitizer and, after being dried, are exposed to light under a negative. Those areas which have been coated on by the light have been rendered insoluble, and when the sheet is developed in warm water, these portions remain to form a relief image which, according to its thickness (which would be density in an ordinary print) contain more or less pigment.

These gelatin images are transferred onto a temporary support, and finally to the paper which is to be the base of the finished print. When superimposed in register, and in the three requisite colors, they form a beautiful color print on paper. Carbon tissues can be obtained commercially in an infinite variety of the three colors.

An improvement upon the above outlined process is the present popular Carbro process. This process does not employ the action of light on bichromate to render the gelatin insoluble, but relies rather on a chemical law which concerns the action of finely divided silver on the bichromates, which causes the gelatin in which the silver is embedded to become insoluble. This action was first observed by Forman in 1889, but was not utilized until 1906 when it was applied to the Carbro process by T. Manly. Three prints are made on bromide paper, and are developed and fixed in the usual manner. After due washing, and while still wet, the prints are put into contact with pigmented tissues and absorb color from these. After a time, the print is carefully removed from the tissue and returned to the water for future use. The tissue is developed in warm water, and the developed tissues are superimposed on the transfer paper to form the colored print.

The next process of note is the imbibition process and its variations. This is essentially the same method by which Technicolor motion picture prints are made. Whereas the Carbon and Carbro processes depend upon the thickness of the gelatin transferred for their colors, the "Ib" processes resort to the use of so-called migratory dyes, which will of their own accord transfer themselves from hardened gelatin into which they cannot penetrate onto a softer gelatin which will receive them. Wall likens the process to the use of a rubber-stamp, which receives coloring matter temporarily, only to transfer it later when brought into contact with an absorbent support.

One of the foremost imbibition processes is the Pino-type process. In this, print plates are made from the original negatives and then immersed in the dye, after which they are placed in contact with the final paper support. Due to the use of aniline dyes, the colors in prints made by this process are brilliant and pleasing.

There are also the various oil processes, such as tri-color bromoil transfer, etc. These processes use a gelatin relief print which is caused to swell by water absorption

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Joseph Walker, A.S.C.

Accent on Mood---

---is Joseph Walker's Creed

by
Harry Burdick

THAN Joseph Walker, an abler maestro of mechanics and moods cinematographic would be difficult to locate in all Hollywood. No fledgling is he in the arts and crafts, physics and chemistries, of imprisoning visual images on celluloid tape for the edification of commercial customers.

His initial terms of screen servitude were during that historic period when a cameraman, as then termed, toted his own instrument about on well-worn shoulders, made his exposures, developed his negatives, made his prints and in spare time performed odd chores around the studio premises.

A survivor of such hardy pioneering must perforce have a sturdy grounding of fundamentals not always granted to later entrants.

And having repeatedly accomplished the photographically impossible when facilities were crude and abbreviated, it is but a natural sequence that his well-exercised ingenuity should now be achieving noteworthy results with all of today's perfected equipment to work with.

And when equipment is lacking to produce effects he requires, he is wholly competent to design the device required.

Two widely spaced incidents indicate his innate resourcefulness and inventiveness; his situation-saving contributions to production procedure.

Long years ago, his company departed for Mexico for the purpose of lensing its star, Nell Shipman, against the authentic foreign atmosphere of Tijuana. For reasons of their own, customs refused passage of a truck bearing divers props and sundries.

Walker found himself with a camera and a star, but minus reflectors. And in those days, one could get along without a star but not without reflectors.

Walker forthwith took the situation in hand and went to San Diego for materials with which to fabricate makeshift reflectors. A round of the city unearthed no supply of the needed ingredients. As a final gesture, he called at an old theatrical storage warehouse and there dusted off a rolled "silver screen" from a defunct local cinema palace.

Tightly tucking the treasure under his arm, Walker sped back to the location. His intention was to cut the screen in four, mount each quarter-section on a frame and thus have a quartet of silver reflectors.

Unrolling the screen, instead of the expected silver surface, one reflecting gold was revealed to the amazed Walker.

This was before the advent of panchromatic film. Walker made his reflectors as best he could and proceeded calmly with his shooting. No one was surprised more than he at the results. History records it was the first time gold reflectors were used. Never since has Walker used silver reflectors on a character's face.

But recently, in filming his current "A Feather in Her Hat" with Pauline Lord on Columbia stages, he again stepped into a problem and brought forth a happy solution.

Diffusian has long been a hobby of Walker's. From his experiments in this field he emerged with a device of his own design, a mechanical variable diffuser. He secured letters of patent, arranged for its manufacture and it found immediate and wide use throughout European studios. He has not exploited its local use.

During the Lord opus a scene called for several items of action and dialogue to be synchronized. Included was a London fog, always present but rolling in with deep density at exactly the proper instant. The mechanics of the scene presented difficulties, particularly handling of the stage fog. Several takes failed to give prescribed results.

So Walker pulled his variable diffuser out of his kit-bag, waved the stage fog away and effectively simulated the fog's incoming within the confines of his camera.

It's a simple device, attached to the front lens and can be manipulated while the camera is operating.

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Large Sets Call for Arc Lights

by
Hal Mohr, A.S.C.

WORKING on extremely large sets not only makes the problem of lighting more intricate, but by the very increase in physical size, adds new difficulties not encountered in the course of normal production. "Captain Blood," which I am now photographing, is an excellent example of these difficulties. The action consists almost entirely of day exteriors, most of which are being filmed on the stages. In consequence, most of the sets are abnormally large, completely filling the largest available stages. Moreover, many of them are complete, four-sided affairs upon which it is impossible to follow the usual methods of swinging overhead parallels for the lamps: with the exception of a bare minimum of floor units, all of the lamps have had to be placed literally on the roof of the stage. With the lamps so abnormally far from the set, merely to illuminate the set becomes a large order, while to maintain any effective source-lighting—especially in day shots—demands a high intensity of light which must yet come from units of small physical size.

Under the conditions of only a few years ago, such an achievement would be virtually impassible. Our equipment and materials would have been inadequate to cope with the physical demands of the situation. Today, thanks to very recent advances in film and lighting equipment, we can meet such a situation assured not merely of adequate, but of really satisfying results. The tremendously increased speed of Super-X film greatly reduces the amount of light needed, and the development of new and more efficient light, like the Incandescent "Solarspot" and especially the new "Hi-Spot" arc recently introduced by Mole-Richardson, minimize both the number and the bulk of the lights needed. To put the matter in a nutshell, six years ago, filming "Broadway," the electrical load on the largest set was over 30,000 Amperes; today, making "Captain Blood" on sets equally as large, we use about 8,000 Amperes, and get better photography. Bear in mind, too, that "Broadway" was photographed on specially hypersensitized film, while "Captain Blood" is being made on regular Super-X!

I have never been in favor of mixing arc and incandescent light unnecessarily. With our present-day Pan-



Photo by M. Marigold, A.S.C.
Hal Mohr, A.S.C., examines two of the new "Hi-Spot" arc spotlights. Note grouping of controls at rear of lamp-barrel.

chromatic emulsions, the yellower light of the Mazda seems more perfectly matched under normal conditions, and adding light of any other color can often mislead the Cinematographer. But in special instances like this, where high intensity is required, or where strong source-light effects or definite shadows are needed, the arc is, as always, indispensable. It is worth remembering, too, that in increasing the overall speed of Super-X, the blue speed has been considerably increased, so that a beam of the bluer arc light which may seem insignificant visually, will make a surprisingly strong impression on the film.

In "Captain Blood," however, strang source-lights were absolutely necessary, and the physical requirements of the sets were such that the requisite strength could only be had with arcs. One of our largest sets represented a pirate ship, and to get a strong key light on one side, which would project a well-defined pattern of shadows from the rigging, I used a row of the new Mole-Richardson "Hi-Spot" arcs. The smooth, perfectly controllable beams from these lamps made it possible to line them up on the stage roof, and adjust their rays so that they projected a smooth flood of light very closely comparable to the sunlight they were to imitate. As the beams of these units are free from the damning dark-spots and element shadows of the old 24" Sun Arcs, there was no need to "cheat" off evenly at the edges, they could be arranged very easily to give a solid sheet of light; the actors did not have to be

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Peverell Marley, A.S.C.

Individual Expression Vital In Cinematography

by
C. Rogers

PEVERELL Marley insists everyone has individual expression, whether expressed in creating a hat, a gown, painting a picture, sculpturing, making a salad or a radiator cap.

"Individual expression plays a vital part in photographing," states Peverell Marley, ace cinematographer. "In every artistic endeavor, this fact is realized and the cameraman must be thoroughly convinced of a scene before he can express it perfectly through the eye of the camera."

Each and every cameraman has his own individual method of filming a scene. Any scene at all out of the

ordinary would be photographed by ten different cameramen in ten different ways. Therefore, in "Clive of India," the "crossing of the river in the storm" scene; in "Bulldog Drummond," the "London fog" scenes; and in "Three Musketeers," the "fencing" scenes would all be individual expression by different photographers.

Scenes as a whole are the individual expression of the cameraman, and the scenes above mentioned are individually expressed by Pev Marley. The many details that go into making up the whole are far too numerous to mention, but the grand total which is reflected in the rays of light that pass through the lens turn out to be the individual expression of the cameraman.

He has photographed every type and kind of picture. Never in his 14 years as a cinematographer has Pev Marley photographed two identical scenes. By this, he must be on his toes, alert at all times—vitaly interested in his work.

Through all his experience, Marley has always been skeptical. One must experiment with new faces. The photographer must put the new face under lights and photograph it at various angles. Lights bring out deficiencies, exaggerate the poorest defect, and yet properly adjusted the same lights will enhance the beauty of a face and change it to photographic perfection. It is experiment and individual expression is then brought out by the cinematographer.

"Our American public idealizes the actor and actress. It is the duty of the cameraman to make them look on the screen as Mr. and Mrs. Public want them to look," said Pev Marley.

Some subjects are photographed with cross-lighting effects; others with full—three-quarters—subdued or highlighted.

"Lighting a Mood" is one of Marley's favorite passions. He realizes that he can accentuate any emotion via the lighting route. By his special trick of subduing lights and with various effects, he can bring the players into a more dramatic mood. By converse methods, a scene can be lighted so that the players screen in a lighter vein.

The cameraman must know that his responsibility is to turn out a smooth, consistent and uniformly well-photographed production. Being well aware of this, and a master in his field, Marley is credited with many of the most successfully photographed productions in the industry.

"Cameramen, like artists, are stylists. Each one has his own individual manner and way of photographing his subjects, and the individualism of the actor or actress must be brought out by the director of photography."

Like a musical composition, every picture has a "key." That "key" must be maintained throughout each and every scene. And this is done by the head cameraman, and not any of his assistants. Through lighting effects and the individual artistry of the cinematographer can perfect pictures be attained.

Pev Marley is a man of details. As soon as he learns what his next assignment is, he gets the script and studies it in detail, and minutely analyzes each character. Then in his mind's eye, he creates the scenes, characters and moods.

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PANCHROMATIC NEGATIVE

Photography is the Star in "Midsummer"

by
N. Smith

RARELY in the history of the motion picture business has a cameraman received so much acclaim as has Hal Mahr for his photographic achievement in filming Warner Brothers' production of William Shakespeare's "A Midsummer Night's Dream."

Critics of the "trade press" naturally follow the work of the cameramen, but in this case the critics from the daily papers and the magazines all have run out of adjectives in their efforts to tell what a beautiful job of photography has been performed by Mahr. That he has been honored as he has is a pleasure for all cameramen, for photographic recognition has been very stingily given.

"A Midsummer Night's Dream" is a picture that could have been spoiled by the wrong kind of photography. That it has turned out to be an artistic triumph speaks worlds for the art of Mahr. But, unlike many people of the films, Mahr refuses to take all of the credit.

"If Max Reinhart and William Dieterle had not cooperated with me in such magnificent fashion," says Mahr, "we could not have done the job as it was done. Dieterle stepped at nothing in the matter of co-operation, even changing plans for an entire sequence when someone pointed out the advantage of such a change. When you work with directors like these two men you cannot fail to give them good work.

"The greatest share of credit for the photography, however, really should go to William Shakespeare, for he wrote a story that made possible all the pictorial achievements in the film. To my way of thinking, Shakespeare as a writer for the screen is superb. There is no evidence of strained effort to be pictorial, such as the modern writer for the screen so frequently discloses. Shakespeare just let his imagination run riot, and put the job of photographing almost impossible situations right up to the cameraman. In other words, he put the cameraman on his mettle."

So there, a cameraman who is receiving more praise for his art than has ever been accorded a photographer



Photos by M. Marigold
Photos from "Midsummer Night's Dream"

before, refuses to take the bows alone. He says nothing about how he must have been steeped in Shakespeare in order to catch the changing moods and reflect them on a little strip of celluloid. He says nothing about how those moods, by the art of lighting, were blended together in such a manner as to leave the audience absolutely unconscious of the changes. Lap dissolves of moods one might well call them.

Mahr believes that the best photography is the photography that does not call attention to itself. That is what he tried, he says, to put into the camera work on the Shakespeare film. That he has succeeded is a matter of record.

Photographing "A Midsummer Night's Dream" really brought Mahr's greatest dream true—for it brought him a new contract that provides for his services not only as a cameraman, but as a director and a supervisor. Now it would seem that his dream of becoming a big-time director will come true. Mahr has had directorial experience in his long and colorful background.

Born in San Francisco in 1894, Mahr decided very early to get into the film business. At the age of thirteen he got hold of an old projection machine, and out of its parts built a motion picture camera—that worked. He quit school and started filming local news events. Sid Grauman's father was running the Empress Theatre, so he engaged young Mahr to make the news events for his house. His dream of film success was rudely interrupted at this point, for his camera was confiscated by a camera patents company on the grounds of infringement.

(Continued on Page 479)



Actual enlargement from a 35MM. frame made in Alaska by Father Hubbard on Agfa film.

"BEST ON THE MARKET!"

SAYS FATHER HUBBARD

WHILE in Alaska, Bernard R. Hubbard, S. J., the Glacier Priest, shot 100,000 feet of Agfa 35 MM. Superpan Film. Returning home for a lecture tour, he had no time to match the original Agfa print or have duplicate prints made. Here's what Father Hubbard writes:

"I used the original print in 258 lectures, and it's still in better condition for pro-

jection than many films sent from film exchanges. I have considered your Agfa negative the best for many years, and now I add my appreciation of your Agfa positive as the best and toughest film on the market."

Agfa 35 MM. films are made by Agfa Anso Corporation in Binghamton, N.Y.



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LOOKING BACK

TEN YEARS

● Jackson J. Rose, A.S.C., has finished filming the Universal production "The Measure of a Man" directed by Arthur Rosson and starring William Desmond. Many beautiful scenes were made at Big Bear Lake.

● E. B. Du Par, A.S.C., has signed as chief cinematographer with Stereoscopic Productions of Sacramento, Calif. Du Par's new organization controls patents for attachments to the camera that are said to make everything stereoscopic, and the results are said to be very satisfactory. Du Par is already at work on the first production "Head Over Heels."

● Walter Lundin, A.S.C., is filming "Hubby" Harold Lloyd's latest feature comedy.

● Hans Koenekamp, A.S.C., is again in charge of cinematography for Larry Seamon who has resumed the production of comedies.

● L. Guy Wilky, A.S.C., is filming "Locked Doors," William De Mille's latest production for Paramount.

● Ira H. Morgan, A.S.C., is in Tahiti filming the Cosmopolitan production, "Never the Twain Shall Meet." Maurice Tourneur is directing. The cast includes Anita Stewart, Bert Lytell and George Seigman.

● Faxon Dean, A.S.C., is in Birmingham, Ala., for the filming of location scenes for the latest Thomas Meighan production for Paramount.

● George Barnes, A.S.C., is finishing the camera work on the Cosmopolitan production, "Zander the Great" which, starring Marion Davies, is being made at the United Studios, Hollywood.

● Joseph A. Dubray, A.S.C., has completed the Frank Woods production, "The Beauty and the Bad Man." Directed by William Worthington.

● Georges Benoit, A.S.C., has finished the filming of "Heaven on Earth," a Hunt Stromberg production directed by Tom Forman. The cast included Marguerite de la Motte and John Bowers.

● T. D. McCord, A.S.C., is photographing "The Desert Flower" a First Na-

tional production starring Colleen Moore. Lloyd Hughes has the lead.

● David Abel, A.S.C., is receiving congratulations on his cinematography in the Warner Bros. Production, "Recompense."

● Charles G. Clarke, A.S.C., has begun work on "Without Mercy" a George Melford production for Metropolitan Productions. Among those who will appear before Clark's camera are Dorothy Phillips, Vera Reynolds and Conway Tearle.

● Al Gilks, A.S.C., is filming "The Female," a Sam Wood production for Paramount. Betty Compton is starred.

● Bert Glennon, A.S.C., has completed the camera work on his latest Paramount vehicle co-directed by Frank Urson and Paul Iribe under the supervision of Cecil B. DeMille.

● Homer Scott and Fred Jackman, both A.S.C. members, have been engaged by First National on a special assignment for some intricate cinematographic undertakings. Though a successful director, Jackman is still in demand as a master of cinematographic intricacies, for which he is famous in motion picture production quarters.

● Andre Barlatier, A.S.C., has finished the filming of a Gorman production at Goldwyn.

● James Van Trees, A.S.C., has begun the filming of "Single Wives" an eight reel First National Production starring Corrine Griffith. George Archainbauc is directing.

● Frank B. Good, A.S.C., is completing the camera work on the latest Jackie Coogan production.

● Paul P. Perry, A.S.C., is photographing Jack Pickford's latest production at the Pickford-Fairbanks Studio.

● Arthur Edeson, A.S.C., will photograph "The Lost World" for First National.

● Sol Polito, A.S.C., is photographing "The Siren of Seville" a Hunt Stromberg production starring Priscilla Dean.

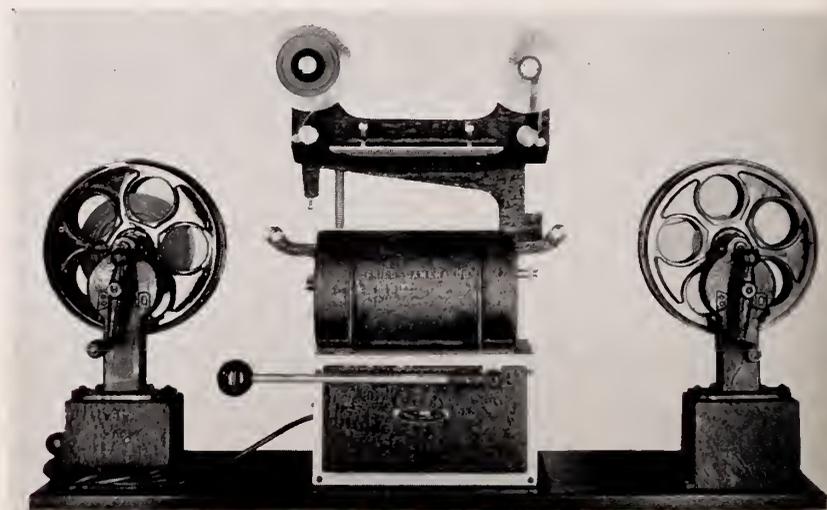
● George Meehan, A.S.C., is filming a Jim Parrott comedy at Fox Studio.

● William Marshall, A.S.C., is shooting Richard Talmadge in a Carlos Production, James Horne directing. The feature is a melodrama with a great deal of whirlwind action so that Billy has plenty of thrills from start to finish.

● John S. Stumar, A.S.C., has finished the cinematography on "Wine" a Universal society drama, directed by Louis Gasnier, with Clara Bow, Myrtle Steadman, Huntly Gordon, Robert Agnew, Walter Long and Forrest Stanley in the cast.

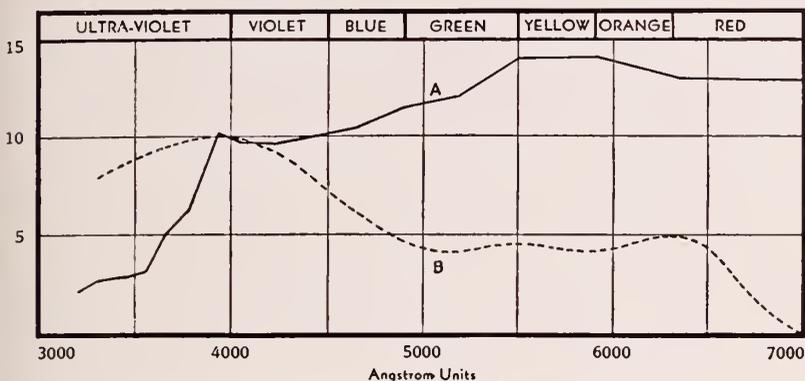
● Henry Sharp, A.S.C., has finished "Tiger Thompson," a Hunt Stromberg production starring Harry Carey and directed by Reaves Eason.

The Fried 35mm Light Tester, which can be adjusted to synchronize with the light of any printer. Its simple construction is said to be one of its outstanding features.



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AT THE SOURCE



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STUDIO lighting that is over-strong in yellow, orange and red must be supplied in excess of actual need in order to obtain the required strength of blue and green. The excess colors can be absorbed by filters to obtain balanced color tones on the negative but the excess heat is absorbed by the actors on the stage—much to their discomfort.

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A NECESSITY FOR COLOR



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Give this new light a trial ✓

Practical Aspects of Natural-Color Still Photography

(Continued from Page 467)



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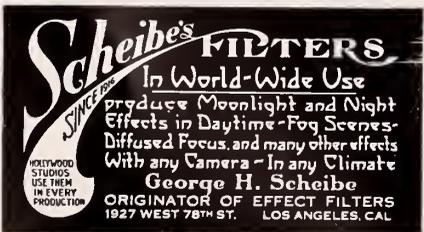
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F 2.3



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in the highlights and proportionally less absorption in the shadows. The inks used in this process are of a type known as greasy inks, and are readily absorbed where there is little water in the gelatin, but are not absorbed as readily where the gelatin holds more water.

All of these processes are to a greater or lesser degree intricate and expensive. The problems of exact color-balance and registration make the production of good color prints slow, and raise the factor of wastage to a high figure. It is therefore important that some relatively simple method of proofing the three-color separations be available. This is found in the use of Belcolor sheets, which consist of celluloid impregnated with the trichrome dyes. The sheets are sensitized and exposed under the negatives; after fixation, the dye remains only on the dense portions. The sheets are then bound together and make excellent transparencies, which are of great value as color proofs, and as a guide to the engraver while making plates from the negatives.

Reasoning from effect back to cause, we finally came to the intricate process of producing the three separation negatives. The ideal solution, of course, is the method used by the photoengraver in making reproductions of paintings and other still life subjects. This is simply a heavy, solid camera which will not be subject to jar when changing plates or filters. Three separate exposures are made, each through its appropriate filter.

But this is hardly possible when dealing with the normal subjects encountered in studio production. The slip-back camera partially meets this need, as it makes the three exposures, changing plates and filters in rapid succession. Some of these cameras are manually operated, while others are fully automatic. The Rayla, for instance, which appeared briefly some ten or fifteen years ago, may be mentioned as typical of the latter class, though somewhat ahead of its time. In appearance, the Rayla camera was not unlike a DeBrie cine camera. Although large in size, it took miniature-camera sized plates, making the three exposures on a plate about the size of a 45x107mm stereo plate. These plates were supplied in magazines: the magazine was placed in the camera and the mechanism wound. When the release was pressed, the three exposures were made in rapid succession, the mechanism automatically moving the plate, alternating the filters, and compensating the exposure for the filter-factors. Prints

were made by enlargement, to any size, upon bichromated gelatin sheets which were superimposed in a special registering machine in the Rayla laboratory.

Another idea which worked well in theory, but did not live long commercially, was the Agfa "Calarsnap" process of a few years ago. In this, roll or pack film was supplied in a tri-pack, with three films and the necessary filters packed together much the same as in the more familiar bipack processes. Prints were made by a modified Pinatype process.

The desideratum obviously is a camera which will permit the operator to make three separate negatives, properly filtered, at a single exposure, through a single lens. The cameras that have been designed to do this are legion; those that actually do it are few indeed. Mirrors or prisms have been placed behind the lens to split the beam, much as in the Technicolor cine cameras; in some designs, two or more lenses are focused on a single mirror, which in turn reflects the image to be photographed. Unless the adjustments in such designs are minutely correct—to less than a ten-thousandth of an inch—a parallax effect will be encountered, or one image will prove minutely larger than the other, and it will be impossible to register the negatives. In addition, there are of course innumerable difficulties in adjusting the exposure and filters so that the three negatives will be of comparable density, in obtaining a lens of proper definition and color-correction which will at the same time have sufficient speed to be usable in spite of the transmission losses in filter and beam-splitter, which reach an aggregate of approximately 45. Naturally, there are several really fine color-cameras on the market, but they are all very delicate and really expensive. Among these may be mentioned the Bermphal, Jas-pe, Vivex, and one or two other makes. Strangely enough, all of them are made in Europe. They are strictly custom-built, being made to order only, and at prices equal to the cost of a fully equipped studio matian picture camera.

Clearly, then, still photographs in natural colors are very definite possibilities: but as yet difficult of attainment, and costly in the extreme. As yet, they have been utilized only in fields where these factors can be safely disregarded. What the volume-production needs of motion picture studios still work might do to these limitations can as yet only be imagined. It is safe to predict, however, that once color stills

are engrafted into studio production, new and valuable developments in the technique of natural-color photography will surely result from Hollywood's instinct to overcome all limitations.

Accent on Mood

(Continued from Page 468)

For one so intimately conversant with the mechanics of his profession, Walker has learned to accept them for their true worth and to subject them to his artistic. He uses them not for their own sake but as media to relate the story of hand.

His constant striving is to make his cinematographic productions notable examples of mood. His entire drama, he subscribes, must not deviate from the straight and narrow path of exact mood. He must resist the ever-present temptation toward the cinematographic turpitude of accented photography.

Photography should be striking only when it contributes to the drama's unfolding. It should not be accented; to divert audience interest away from the drama to the photography itself.

To this end, he believes in being not too literal in his work; of leaving all detail possible to the auditorium's imagination for its own interpretation.

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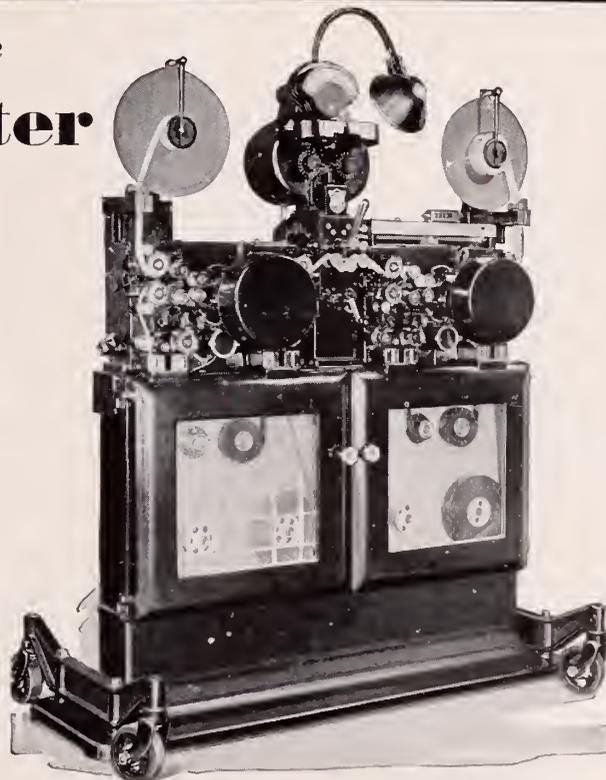
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slam of the recent Academy awards. Indeed, he has officiated cinematographically on all of Director Capra's works for many years. As returns came in from this popular production, Walker has tabulated the varying interpretations placed on specific scenes by audiences of varying classes.

From what he didn't show on the screen, individual viewers of the picture have been able to write in their own preferred meanings. They thus participated more fully in the unfolding drama—they got into the picture and its mood. And enjoyed it the more.

Being that rarity, a fine artist yet utterly practical, he can when commer-

cial considerations intrude, inject accented photography of striking effects, drawing from his deep technical experience for the specified italics.

Out of his long years of experience Walker has evolved his creed of sharing his drama's situations with his audience. With exact definition and maintenance of mood he gains their confidence, makes them believe. By his cinematographic reticence he draws out their own interpretations of screened actions.

It is significant that audiences, for subtle reasons they themselves do not identify, enjoy Walker's pictures to deeper degree. And what is higher tribute to cinematographic ability?

Large Sets Call for Arc Lights

(Continued from Page 469)

warned away from certain areas, lest they be seen to walk out of one beam and into another.

In the same way, photographing other huge sets, such as the stockade, etc., these lamps provided a perfect key-light to represent the strong tropical sunlight of the Spanish Main. Especially in these sequences, the remarkably small size of the "Hi-Spots"—they are hardly as large as the old 80 Amp. rotary condensing-lens spotlights—made it possible to use a large number of them in the very cramped space available. I doubt if it would have been possible to place even one or two Sun Arcs on the stage roof, which was the only place we had for our lights; but we used twenty or thirty "Hi-Spots" at a time up there, and were hardly conscious of them.

The "Hi-Spot" is a companion unit to the popular (incandescent) "Solar-spot." It utilizes the same type of lens and a remarkably efficient new arc mechanism. In intensity, it is more than comparable with the 24" Sun Arc, while avoiding all the faulty beam distribution of the mirror type lamp. Compared with the older lens type arc spotlights, it is immeasurably more efficient: considering the improvements in the lens alone, the older lenses worked at f:2.2 or slower, while the new type works at f:1. The beam can be pulled down to less than 8 degrees, or flooded out to well over 40 degrees, at all times maintaining a high intensity.

In the older units, the carbons fed intermittently. This made the light change considerably in both intensity and color at unpredictable intervals during the burning period. In the "Hi-Spot," the carbons feed continuously, and the positive carbon is rotated a good

deal faster, maintaining the positive crater in an almost perfectly symmetrical form, and giving a perfectly steady light. In the old types, too, the carbon feed was rather noisy, so that when working close to the microphone, the feed had to be stopped entirely; in the new lamp, tests have shown that the feed can be operated at normal speed within ten feet of the Mike, while when working closer, all that is necessary is to slow the feed slightly.

A frequent criticism of all condensing-

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lens lamps—whether arc or incandescent—is that at extreme distances, their beams did not have as great carrying power as a mirror lamp. The Fresnel-lensed "Hi-Spot," though it may not be as penetrating as a large mirror arc on a tight beam, is certainly a remarkable advance in this respect. Filming some of the night exterior scenes in the set built to represent the town where much of the action takes place, I have had "Hi-Spots" projecting their beams successfully for more than 150 feet.

It is significant of the real need for modern arc lights in black-and-white production that although these new lamps were designed primarily to replace the old 80-Amp. Rotaries and 24" Sun Arcs in Technicolor photography, they have since their introduction been monopolized by Cinematographers who, like myself, have encountered, in black-and-white productions, situations and problems which only these most modern arcs could solve.

Photography Is the Star

(Continued from Page 472)

Undaunted by the turn of events, Mohr soon connected with Miles Brothers, the first film company in San Francisco. Next he aided in opening the Pacific Film Company, for filming news weekly.

His first photographic work of moment was the filming of "The Last Night of the Barbary Coast," which was Sid Grouman's first motion picture production. In 1913 the first five-reel films appeared, and Mohr photographed such films as "Money," "Salome Jane" and many others.

In 1914 Mohr persuaded his parents to form the Italo American Film Company. Mohr rented an old store and a vacant lot. Then he wrote an original story, "Daughter of the Gods," adapted it for filming, gathered his cast and directed and photographed the piece. He developed his own film and cut it himself. It was a sort of one-man band arrangement. Eventually the picture was completed and was sold for \$10,000. He made no salary, but did return a slight profit to his backers.

Mohr landed at Universal as a film cutter in 1915. He co-directed one Ruth Stonehouse picture, and then went with Hal Roach where he directed in shorts such stars as Harold Loyd, Snub Pollard and Bebe Daniels. He also did the camera work.

He went overseas with the army where he remained in the photographic service until the Armistice was signed. The war over he found himself back in Hollywood again filming more and more important pictures. Douglas Fairbanks and Mary Pickford saw his work in o

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picture and sent for him. He stayed with them for the next two years. Along the line came such pictures as Van Stroheim's "Wedding March," "Naah's Ark" and others. He made Al Jolsan's first film test for "The Jazz Singer," the first Vitaphone talking film.

After three years with Warners, he went to Universal where he did such outstanding films as "Broadway" and "King of Jazz." Then an loan to Warners he did his most outstanding photographic work in the filming of "Outward

Baund." That was a picture in which mood as caught by the cameraman meant everything to the success of the film. "State Fair" for Fox was another distinguished piece of work.

And now "A Midsummer Night's Dream," which will probably take from the industry one of its greatest camera artists, for Mohr is destined to direct. Apparently Warner Brothers recognized that when he had finished the filming of the Shakespeare picture, for it was then that they gave him his new contract. But his head has not been turned by success. Quietly, a bit shyly, he still insists that a man named Shakespeare had more to do with it than anyone else.

STORE ENLARGED

The Camera Supply Company of Hollywood have enlarged their quarters in Cahuenga Blvd. by fitting the basement for the professional end of their business and the main store floor for the retail branch of the company.

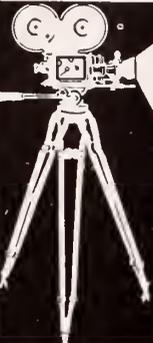
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According to report from Mation Picture Camera Supply Co. of New York City, that concern is supplying all of the camera equipment used by Roy Davidson who is shooting backgrounds for Columbia Pictures Corp. in New York City. This company also furnished the camera equipment to Ray Binger, A.S.C., who supervised the background shots for "Shooting the Chutes" featuring Eddie Cantor.



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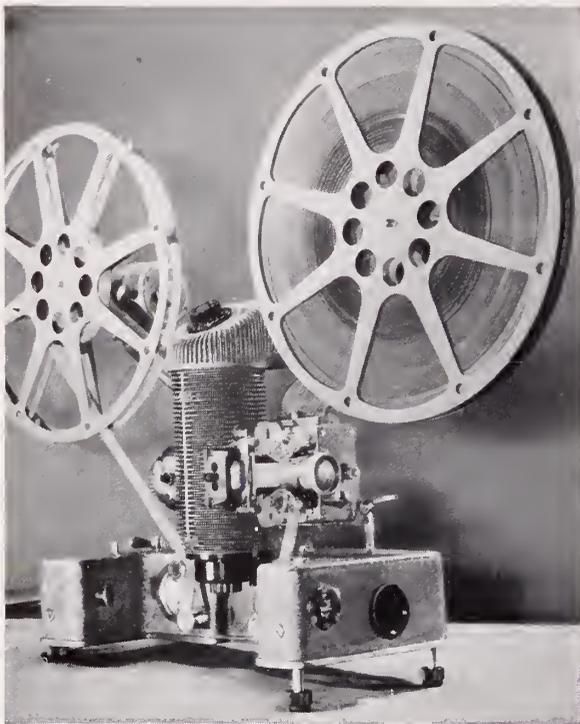
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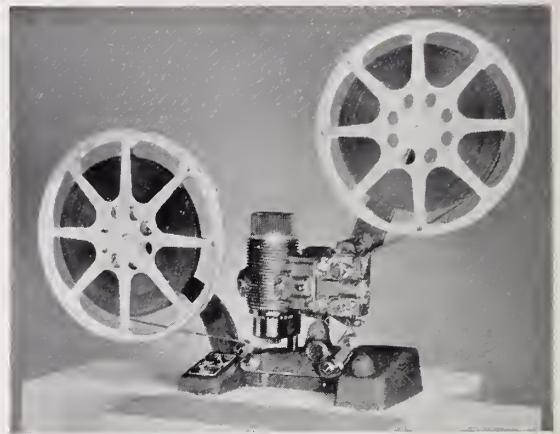
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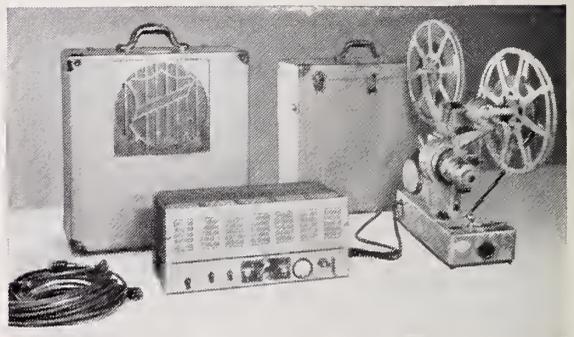
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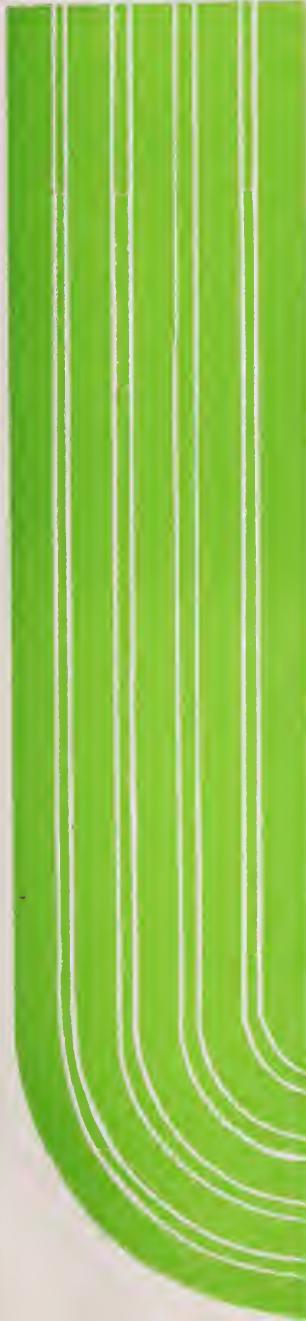
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AMATEUR MOVIES



this issue

Lighting the Long Shot
Composition in Pictures
Homemade Flood Light
Filming an Eclipse
Spectacle Lens Macrography
... and other features

NOVEMBER
1935





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AMATEUR MOVIE SECTION



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Next Month . . .

●Karl Barleben, Jr., who has made a reputation far himself in the miniature field, turns to the movie camera to tell us some interesting things to do when making "Snow Pictures."

●J. Belmar Hall will continue his series of articles on compositian. Mr. Hall has a background of many years as a successful artist before turning toward the camera for his medium of expression. He speaks authoritatively.

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Lighting the Long-Shot

by
Walter Blanchard

THE real problem in home-movie lighting is the long-shot. So much has been written about close-up lighting that everyone knows how to arrange his lights for the closer scenes. But the long-shot is in itself a bigger problem—and we cinematic pen-pushers have more or less neglected it for the more common topic of portrait lighting.

In lighting a close-up, the subject is the most important factor; lighting reduces itself to a relatively simple matter of putting one lamp on one side of the camera, and another on the other, with one lamp nearer the subject than is the other. This gives an essentially natural lighting, with one side of the face accentuated by the stronger light, and the other moulded in soft shadows.

But in lighting long-shots, the home filmer all too often overlooks the value of shadows, and nervously throws a strong flood of light over the entire picture. No wonder that the result is flat on the screen, without character, charm or naturalness! The first rule for lighting a long-shot should be that both the subject and the background must be lit naturally, accentuated with high-lights and moulded with soft shadows.

Perhaps the simplest lighting set-up for the average long-shot is a simple expansion of the basic close-up lighting. As a rule, this will require six or seven lamps: but some of the lamps used may be of the inexpensive, clamp-on variety, and others may be bridge-lamps fitted with Photoflood globes, so no overly great outlay will be necessary. The two lamps nearest the camera—one on each side—take care of front-lighting the subject, just as in a close-up; one should be a bit farther away than the other, to provide a shadow side. Beyond these units come two more, arranged to cast their beams onto the "set" behind the subject. Beyond these are yet two more lamps whose duty is to illuminate the back wall. All of these front lighting units should be set up in the unbalanced formation, those on one side closer in than those on the other side, to carry out the basic "two-sided" lighting. High up on the back wall—well outside the camera field—a clamp-on light is placed with its beam directed forward and down onto the actor, to provide the back-lighting that makes him stand out from the walls. If there is a wall-fixture in the picture, it should be turned on (using its regular



Above: Soft shadows lend naturalness to the long-shot. Note how shadows from chairs make furniture stand out from wall, and highlights on curving objects suggest roundness.
Below: Contrasting planes in lighting for emphasis and depth. Note beam of light from open door at left.

bulbs), so that it will suggest a source from which the back-light will apparently come.

This sort of a set-up is enough to give a good, straight-forward long-shot lighting. But it does not by any means begin to take advantage of the possibilities of long-shot lighting. Study the long-shots in the next professional film you see: you will notice a surprising effect of depth. This is often gained by simply contrasting the lighting on the different planes of the picture, so that they stand apart from each other visually. In our simple long-shot, we could for example put diffusers on the two lamps illuminating the back wall. This would soften the light there, so that our actor, strongly lit from front and back, would stand out more clearly. On the other hand, if he is in dark clothes, we could increase the light on the back wall, and more or less silhouette him against a light background: the front-light would give us plenty of detail, however, in the foreground.

(Continued on Page 496)



Fig. 1



Fig. 2



Fig. 2A

Putting Composition Into the Picture

LAST month I gave a chart containing all the elements in structural design. Each one has its relation to good composition, with them all combined we have perfect harmony. The first consideration in cinema is action, without action we have not a motion picture, but a static form that is no better than a still picture. We might just as well use an enlarged photo and shoot it in motion pictures if that is all we are going to get on the screen. Unless the related lines set up motion and continue to keep this flow of action all thru our film we have broken the rule of composition and no matter how interesting the subject is it will only be just another picture.

The line that denotes action is the oblique line, as it falls away from the vertical it is the movement of falling away that commands attention. The moment we see an oblique line we see that it converges and must lead the eye in or out of our picture into some related action. Even if there is no other movement than the oblique line it will appear to the eye as movement or action. A glance at Fig. 1, you will note that the light and shadow are the only things that have made this so, yet we have dramatic action even if the figure did not move, or we cut the shot at this point. Fig. 2, is almost the same shot but the shadow gives us another action angle that is built up by the close-up, Fig. 2A, that has brought our attention to its dramatic value by the oblique line and as we come into the scene we are more concerned with what the figures are doing at

by

J. Belmar Hall,

Instructor, Department of Cinema, U.S.C.

the window only because our eyes have led us into them by this line of action.

Fig. 3 is bringing the oblique line from above, that is we have built up our dramatic action thru some light source. When we cut into the closeup of this same scene, Fig. 3A, we retain the same mood, but the oblique line is emphasized by seeing the angle line in clearer view. When we are trying to create an emotional value we must always remember that the eye will follow the dramatic lines of an oblique line quicker than any other line. It must lead you in or out of the scene. A direct contrast, repetition, in line would mean that we have an oblique line coming from the opposite direction which brings the two lines to a central point. Again we have the dramatic. Fig. 4, we have men pulling ropes from above, and their bodies take up the opposite of that action, therefore we have set up emotionally two oblique lines that are related as they converge from opposite directions, but bring our eyes to the central interest which is dramatic action. If you will divide the two lower halves you will see that each half is in composition and if

(Continued on Page 501)

Fig. 3

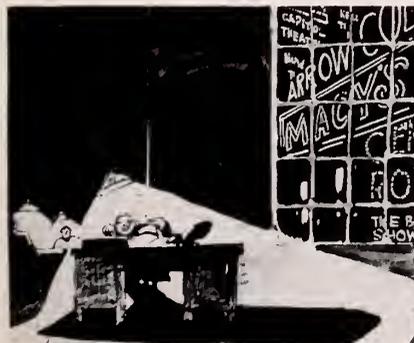


Fig. 3A



Fig. 4



Dishpan Into Flood Light

by
William Stull, A.S.C.



SHOOTING some Kodachrome interiors the other day, I discovered that all of my lights put together were barely enough to provide sufficient general illumination to give me an exposure. There wasn't a single lamp to spare for creating modelling and light-effects. So I decided to get one or two extra-powerful floodlights to take care of the general lighting, while some of my regular lights did service in modelling.

Right there I made another discovery: nothing I could beg, borrow or steal (aside from huge studio lights which would have blown my house-fuses in a second) would provide the requisite high illumination over a wide area. Most amateur lighting units are of the floodlight class—and they seem plenty powerful, too—but they are designed for general all-around use, and project their powerful beam over a relatively narrow angle. If I wanted something that would give approximately the same unit intensity over a very wide area, I would have to build it myself. That is just what I did. My floodlight is hardly a factory job, for it was assembled from odds and ends picked up at the five-and-ten and in kitchenware stores: but it does the trick. And the total cost was exactly three dollars.

Needless to say, such a lamp won't be as efficient as a lamp designed and manufactured solely for photographic use: its makeshift reflector can't handle the light as effectively as one designed by a trained illuminating engineer, and built for that purpose and that purpose only. After all, you can't expect a three-dollar makeshift to perform as perfectly as a professional product which sells for forty-five or fifty dollars!

The foundation of the lamp—the reflector—is an old-fashioned tin dishpan. Incidentally, with the advent of the modern concept of the kitchen beautiful, dishpans are going highbrow: enamelware, brushed aluminum, and other fancy pans are plentiful (at fancy prices, too!) but the generous tin dishpans of yore are hard to find. Mine is 17 inches in diameter at the edges, tapering inward to a bottom circle of 14 inches, and 6 inches deep; it cost \$1.35. Figuring that Photoflood globes have a bulb 2½ inches in diameter, and are 4¾ inches long, I found I

could safely use six Photofloods in my dishpan. There was room to crowd in one or two more, perhaps, but that would have left too little room for ventilation; the globes would become too hot, and their already short lives would be yet further shortened unnecessarily. So I distributed six Photofloods around the rim of the pan, with their bulbous ends converging toward the center. They are mounted as close to the bottom of the pan as possible, so that the light won't scatter too far at the sides. The sockets were bolted onto the pan.

My dishpan has a tapering rim, so I used bakelite sockets (15c apiece at the five-and-ten), and ground the bases of the sockets on one side so that the lamps would stand fairly straight.

The wiring inside the pan was done with fairly heavy, single-wire rubber insulated cable, also from the 5G10. The lamps were wired in parallel, of course. At the side I decided would be the bottom, I drilled a hole through which the wire passed to a switch (another 15c to Mr. Woolworth) which was mounted on the rear of the lamp. From the switch I ran twenty-five feet of rubber insulated, two-wire cable terminating in a rubber-covered two-prong plug.

The next question was a stand upon which the lamp could be mounted, and a tilting device of some sort, so that the unit could be directed at the proper angle. Looking over my photographic kit, I discovered an old tripod that somehow had missed being loaned or swapped. There was my stand—but it had no tilt-head. Again, the photographic cast-offs yielded the solution: I dug out an "Optipod," a little ball-and-socket jointed gadget that had kicked around in my camera kit for fifteen years or more. Underneath the pan, I fixed a bit of heavy scrap brass, such as can be picked up in any machine-shop scrap-pile. In this I drilled a hole threaded to make a tripod-screw, and attached the "Optipod." And my floodlight was complete.

(Continued on Page 500)

Cinefilming an Eclipse of the Moon

by

George F. Ryan

WHILE watching the eclipse of the moon several weeks ago, it suddenly occurred to me that it would be mighty interesting to try to make a motion picture of the event. Of course, I had never photographed an eclipse before, and as I'm not even an amateur astronomer, I had only the haziest notion of how to go about it. But I took a chance: and because I managed to get some surprisingly good results, I am passing on to anyone who may be interested this description of what I did.

I did not start to make pictures until the moon was covered. Therefore I made pictures only of the uncovering—the last half of the eclipse.

To start with, I set up my Cine-Kodak Special on a good strong tripod, on the front porch roof. I figured I would be there for some time, so I took a comfortable chair out onto the roof with me. And was I glad to have that chair! The part of the eclipse I photographed lasted from about midnight until nearly half-past three in the morning. Making my film in stop-motion, one frame at a time with an interval between each exposure, I made nearly four hundred separate exposures.

As I decided to make the picture literally at the eleventh hour, I had to use whatever film was in the camera. In this case, it happened to be Cine Kodak Panchromatic film, and it gave me excellent results. As each frame had to have a moderately long "time exposure," which can easily be given in the "Special," I don't think there would be any great advantage in using SuperSensitive; in fact, there might be some disadvantages.

The first problem was the matter of reading the light to determine the proper exposure. Not being an astronomer, I knew only that the light from the moon was moonlight. Moonlight is very nice for poets to talk about—but the problem was, "how much was it worth for exposing film?" Naturally, I turned to my Weston exposure-meter for the answer. Again I ran into a problem! The Weston designers have provided a solution to most any normal exposure-problem—but moonlight exposures can hardly be classed as normal problems. Moonlight is, I knew, reflected light from the sun; but somehow, I didn't feel that that was enough reason to class it as daylight. On the other hand, it certainly wouldn't come under the heading

of "Tungsten Light"! But I didn't have to worry about this matter very long, for I soon found that there was not enough light to operate my meter at any setting.

There was only one thing left for me to do—take a chance. I took a chance, and gave a good, long exposure. Maybe my guess was right; maybe the latitude of the film and the skill of the laboratory experts deserve the credit. At any rate, my exposure turned out to be about right.

Thanks to the reflex focusing device of the "Special," it was easy to line up my camera for the shot. First I tried my one-inch lens, wide-open at $f:1.9$, of course. I saw at once that the one-inch lens covered too wide an angle, and would only give me a very small picture. I'd rather expected this, but if I could use that extra speed, I naturally wanted to!

Finally I used the 6" Telephoto lens, wide open at $f:4.5$. Naturally, as the moon is something like a quarter of a million miles away, I set the focus for infinity.

The 6" gave me a pretty fair-sized image of the moon; in fact, it fills about a third of the frame. But due to the long focal-length of the lens, I soon found that the slightest movement of the camera sent that old moon jiggling all over the finder. I had to move as gingerly as though the camera had been loaded with TNT; but finally I got the moon centered on the cross-hairs in the finder.

Using the single-frame hand-crank, I carefully opened the shutter. As soon as this was done, I turned a flashlight on the dial of my watch, and gave the frame an exposure of exactly one and one-half minutes. I don't know why I selected that particular length of time—but as things turned out, I hit things just about right. When the time was up, I closed the shutter.

(Continued on Page 502)



Spectacle-Lens Macrography with the Special

by
Fred C. Ells

(NOTE: The author, Fred C. Ells, will be remembered as the maker of the 1933 Contest prize-winner, "Rice." He is an American oil-company executive in Yokohama, Japan, who between intervals of purveying oil for the lamps of China and the motors of Nippan, engages in amateur Cinematography with outstandingly original results. Editor.)

MR. LINDSEY W. Ross, in the April, 1935, issue of "THE AMERICAN CINEMATOGRAPHER," contributed a workmanlike article on the use of auxiliary lenses in titling with the Cine-Kodak Eight. I have never tried titling, and don't expect to: but that

article was the most useful I have read in months, because it opened a new world to my Cine-Kodak Special.

Using auxiliary lenses with most cine-cameras is, I imagine, a fairly tricky proposition. With your focus carried forward to so near a point, one can expect very little depth of focus, and the area covered is such that except in a rigid arrangement like a title-board, it ought to be rather a problem to line your shot up with any confidence. But with the reflex finder of the Cine Special, work with simple auxiliary lenses should be comparatively easy. I decided to try it.

From an optician's I bought three ordinary spectacle-lenses, of 1½, 3 and 5 diopters. At a glass shop I had these cut down to fit the filter-cell of my 4½" telephoto lens. With this improvised equipment slipped over the barrel of the telephoto, a glance through the reflex finder was a revelation. Through the 5 diopter lens a silkworm suddenly looked like a huge white boa constrictor at close range. Macroscopic cinematography at a cost of 6 yen is decidedly the best bargain of 1935!

Next I had a machinist turn out an aluminum adapter to fit my spectacle-lenses to the regular one-inch lens. The inner end of this fitting is shaped like the regular sunshade for a one-inch, f:1.9 Eastman lens. The outer end flares to exactly the same outside diameter as the telephoto lens shade. In use, I remove the sunshade from the one-inch lens, and replace it with the adapter, the outer end of which takes the regular telephoto-lens filter cell, in which I mount the spectacle lens. In this way, I can not only use one set of spectacle-lenses for both camera objectives, but also double up on filters, making one set do for both objectives. This is a big advantage, particularly with the spectacle-lenses, for the supplementary lenses give different fields when used with different camera-lenses. And using only one set of lenses, with a single holder and adapter, the entire range is instantly available at all times, yet easily tucked away into case or pocket. This complete interchangeability, however, is only possible when one uses a camera like the "Special," with its reflex finder.

A good deal of my last picture, "In the Beginning," was taken at the zoo in Tokyo. I have no special privileges there, so I had to shoot everything through the wire of the cages. The reflex finder showed me that one can place a camera lens right on the wire, with the wire straight across the lens—and it won't show on the film, except perhaps as a slight and pleasing diffusion. With the big telephoto lens you can work four or five inches away from the wire without showing any wires on the screen. Why this should be, I am not a good enough technician to say: but if you don't believe it, just lay a piece of wire across your lens and try it!

For photographing small animals, birds and insects, I find the 64 frames per second speed very handy. Birds are apt to move suddenly, but if you can get them to stay in focus for three or four seconds at 64 frames per second, you have enough film for one shot. Also, the high speed necessitates opening the lens, thus throwing everything but the bird out of focus. This concentrates attention where it belongs—on the bird—and gives a softer, more portrait-like quality. It is a real advantage.

For small reptiles, white mice, squirrels, etc., a glass cage about two feet long by a foot wide proved very useful, as these lively little artists have no idea of posing unless they must. One has to be very careful about reflections, though, when shooting through glass.

(Continued on Page 498)

Inside Workings of a Ship's Photographer

by
Karl A. Barleben, Jr



Leicaphoto by Nina Morgan

THE other day I was privileged to get a peek into the inside workings of ships' photographers' lives—I was invited to visit a while with Hanns Tschira, ship's photographer on the Hamburg-American North German Lloyd liner "Calumbus" while she was docked at the foot of 46th Street on the Hudson River, New York City.

Tschira conducted me up to the sun-deck where indeed the sun seems to shine gloriously and warm, and thence to a fairly small, white structure situated rather aft-center. This was the photographic department of the vessel. In we went, and I was treated to a most amazing lay-out of small rooms, each designed and equipped with everything needed, and all placed with an eye to compactness and the utilization of every bit of space wherever possible. The first room served as an office, and here just off the door was the desk, above which a series of pigeon-holes, into which the photo-finishing jobs are placed ready for delivery. On the opposite side of the room a work-table, running the entire length, was to be seen. Here prints are sorted, trimmed, spotted, and inserted into their delivery envelopes.

Straight ahead was another door which leads into one of the darkrooms. This room contains a fast-working contact printer for contact prints from Kodak negatives, a Leitz Facamat enlarger for making enlargements from Leica and similar negatives, several sets of rapid driers made of curved steel covered with canvas, cabinets simply loaded with hundreds of film rolls, boxes of printing paper in various sizes, grades, and finishes, and a print-washer and sink. The illumination is exactly the same as you'd expect to find in any well-equipped darkroom.

To the left of the room was another door which leads into the negative developing darkroom. Here were six deep tanks, such as are used by commercial photo-finishers, ample sink space, cabinets for chemicals and odds and ends. The idea occurred to me to ask about the wash-water, figuring that as sweet water is carried in huge tanks on board, one would have to be careful about wasting it. Tschira explained that his wash-tanks are running almost continually, and that the vessel's tanks hold so much that what he uses on a trip—which is plenty—is a mere "drap in the bucket" so to speak, and that they never give it a thought. I also asked if the solutions ever spilled when

the ship was at sea and raked, but was informed that such is not the case; that ample provision is made for such conditions.

The volume of photographic work on a modern liner is so great that it requires five men to adequately handle it all.

Hanns Tschira was one of the contributors to the International Leica Exhibit, and is, in his own right, one of the foremost photographers of our day—and recognized as such. For the past several years he has done all of his work exclusively with the Leica—or rather six Leicas, I should say. A slight idea of his activity may be gained by my telling you that on board the "Calumbus" alone he has a shelf of negative files containing more than 25,000 Leica negatives—all neatly numbered and accounted for, in strips of five negatives each, encased in cellophane envelopes which are bound in substantial volumes. In his home in Bremen, Germany, a similar number of negatives are on file. Not only are these just negatives; they are exceptional negatives, each one a gem of beauty and sparkle. If you have seen the International Leica Exhibit you will remember that Tschira's pictures were of the finest technical excellence and pictorial beauty. All of his negatives possess a similar characteristic.

His personal business is such that an American agent handles his work for publications. Practically all of the photographs seen in folders, booklets, and posters advertising the Hamburg-American North German Lloyd Lines are the product of Tschira's magic cameras.

After browsing through the files of glossies, Tschira hauled out a few of his specialties which he has found to be of infinite value in his work aboard ship and on land. One was a metal cross-piece made to hold the Leica which fits over a glass flower vase. When persons are to be photographed at dinner, or when candid pictures are the order of the day, the vase is filled with flowers in such a way that the camera is completely hidden from view,

(Continued on Page 498)



HERE'S HOW

by A. S. C. Members

WHAT does the classification of a lens as a 1.9, 2.9, or 3.5, indicate and how is this arbitrary classification arrived at?

I understand that the speed of any lens depends upon its relative aperture to its focal length which would seem to indicate that a 1.9 lens opens up the diaphragm more than a 2.9, but what formula is used in thus marking lenses? Why is the E.K. 1.9 lens so much larger in diameter than a Dallmeyer 2.9? I mean its appearance in the cell would indicate that it is many more times the area of the Dallmeyer.

I understand that any number of lenses having 1 inch focal length allows the same amount of light to enter when the lens is set at a given diaphragm stop such as 8 etc. Is this correct? I would appreciate any information you can give me on this subject.

C.S., Rock Island, Ill.

The classification of a lens as an F/1.9 or 2.9 or 3.5 definitely indicates the maximum effective aperture of the lens.

It is not arbitrary but indicates the ratio effective aperture diameter to focal length, expressed as f/d where "F" stands for the focal length of the lens and "D" for the diameter of the aperture.

This method of classification had been proposed in 1881 by a committee of the Royal Photographic Society of Great Britain and definitely adopted by the International Congress of Photography held in Paris in 1909 according to the following decisions (not in full):

A. Each diaphragm is to be characterized by a fraction of F/n where "n" is the result obtained by dividing the absolute focal length of the lens by the effective aperture of the diaphragm. The value "n" shall be engraved on the lens mount.

B. All photographic lenses shall be characterized by a standard series of diaphragm apertures, and shall always be in accord with the following progression which corresponds for each of its terms to an exposure time double of

the preceding one. F 1, 1.4, 2, 2.8, 4, 5.6, 8, 11.3, 16, etc.

C. If the effective maximum aperture does not correspond to one of the Terms of the progression it will be indicated as to its real value but the next marking and all that follow shall be according to the progression.

Thus the maximum aperture of an F 1.9 lens is between F 1.4 and F 2. The markings of the mount will indicate F 1.9, 2, 2.8, 4, 5.6, etc. The Diameter of an F 1.9 would therefore be approximately twice the diameter of an F 2.9 of equal focal length.

The Diameter of the lens is not, however, a true indication of its aperture because the effective aperture is determined (in the common case in which the diaphragm is placed between the lens components) by the virtual image of the diaphragm formed by the lens components.

Under these conditions the effective aperture is always greater than the actual area of the diaphragm.

Lenses of the same focal length working at the same aperture will transmit the same amount of light if they are of the same construction.

Different types of construction involving differences in the number of elements used and their thickness will have an influence on the amount of light transmitted. These differences are, however, rather small and would have to be accounted for, only in special case, for instance on photographic work from which quantitative measurements are to be derived. In common amateur practice these differences can be considered as inconsequential.

J. A. Dubray, A.S.C.

I WANT to try some experiments in animated cartooning with my 8mm camera, but it does not have a single-picture mechanism. Is there any way such a movement could be added to my camera?

W.D., New York City.

The principal manufacturers of 8mm cameras advise us that it is not feasible to build such a feature into their existing designs. However, a single-frame release can be added to most 16mm or 8mm cameras as an outside attachment. The Grace "Electrimote" is probably the best known of such attachments, and permits the shutter to be tripped by pressing an electric button-switch, which may be located at any distance from the camera. Some cinamateurs have also

told us that with a little practice they have been able to learn how to flick the regular shutter-release of an 8mm camera so quickly that only one frame is exposed.

Wm. Stull, A.S.C.

IS 8mm film slower than 16mm film? I notice that recommended exposures for 8mm are about f:8, where regular 16mm Pan would call for f:11 or less.

W.E., Palo Alto, Cal.

Eight mm. Cine-Kodak Panchromatic film is at least as fast as regular 16mm Pan of the same manufacture. The difference in the exposures recommended is due to the difference in the shutter-openings of 8mm and 16mm cameras. The average 16mm camera has a shutter-opening of 170 to 180 degrees, while some, like the Filmo 70 and Victor, have openings of over 200 degrees. In the more compact 8mm cameras, the shutter opening is more nearly 120 degrees. This means that less light is admitted, and consequently, the lens must be opened up in order to compensate for this. In terms of actual exposure-time, the larger shutter of the 16mm camera gives an average exposure of 1/30 second, while the smaller opening of the average 8mm shutter gives about 1/50 second. This is quite enough to account for the difference in the recommended lens-openings.

Arthur Miller, A.S.C.

IN articles dealing with professional cinematography, I have often seen references to "Neutral Density Filters." What are they? And can they be used in amateur filming?

R.G.W., San Antonio, Texas

The Neutral Density Filters are colorless grey filters which reduce the amount of light without having any effect upon the rendition of colors in the picture. They are used both to control exposures where it is not desired to alter the optical quality of the picture by stopping down the lens, and especially to soften glare and harsh light-contrasts. They are available in several densities, those most generally used being the 25, 50, 75 and 100% absorption filters. They can be used quite as well with substandard cameras as with professional equipment. In fact, for a long time the only way of controlling exposures in Kodacolor was by the use of Neutral Density Filters.

Daniel B. Clark, A.S.C.

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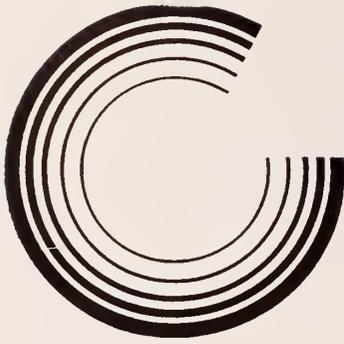
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WHEELS OF INDUSTRY

New Lenses

●The already complete bottery of lenses for the Leico comero is now being odded to, according to E. Leitz, Inc. Three new hove recently been mode oavailable for use on the Leico—on extremely wide-angle, o new special soft-focus portroit, ond on extremely long-focus telephoto.

The Hektor f:6.3, 28mm lens opeels to those workers who require on extremely wide-angle objective which at the some time embodies certain fundamental optical choracteristics which ore not always to be found in lenses of this type.

The Thombor f:2.2, 90mm lens is soid to be of revolutionary design producing o plasticity ond optical softness not produced in any other way. For portroits ond pictorial work it is ideal, its speed making it doubly voluable. An ouxiliry gloss "central stop" controls the degrees of softness. When stopped down to f:9 or more, the Thombor reverts automatically into o shorp-cutting lens, thus it is both o soft-focus ond shorp lens.

The Telyt f:4.5, 200mm lens is a telephoto lens which is used in conjunction with o mirror reflex focusing device. Here is the lens to pull in distont objects, producing them os closeups on the negative. The visual focusing device, equipped with two special magnifiers, ossures critical focusing with the greotest of ease.

These three new lenses, odded to the bottery of Leico lenses, make the Leico the most versotile ond complete photographic equipment oavailable. All lenses (excepting the Telyt which focuses through the special mirror reflex device) couple automatically with the "Autofocal" built-in ronge finder.

The new Leica lens booklet "The Interchongeoble Leico Lenses" (booklet 1243) is now oavailable on request. It gives complete details about each of the thirteen Leico lenses now on the market.

Carrying Cose

●The Motion Picture Screen & Accessories Co. of New York City, manufaturers of Britelite Truision Portable Screens, indoor floodlight reflector units, film storage coses ond projector coses,

have odded to their line o new carrying cose for the Keystone Projector which is soid to embroce novel features.

With the new Keystone De Luxe Cose, which is suitable for either the B 63, A 74, or A 78 Projectors, risk of domoge to the projector is cloimed to be avoided, os the bese of the projector fits firmly into the bottom of the cose ond connot wobble while being carried. When reody for projecting pictures, the cose opens on both sides leoving the projector free for the threading of the film without hoving to remove it from the cose. When the show is completed both side flaps ore brought together enclosing the projector in the cose. Thus the mochine can be run while in the cose in which one carries it.

In addition to the above they also make the cose for the new Keystone 8mm Projector—G.8.

Berndt Moves

●The Berndt-Mourer Corp., monofucturers of the professional type 16mm sound comero, continuous sound ond picture printer, High Fidelity sound recording opporotus ond Golvanometers, onounces its removal to the 7th floor of 117 East 24th St., New York City, where they will be oble to increase their facilities because of larger floor spoce to meet their present demonds for equipment.

Educator Animatophone

●The Victor Animotograph Corp. created their Model No. 25 16mm Sound-on-Film Projector for those markets

where the oudiences do not exceed 200 people.

According to their onouncement the principol distinction between Educator 25 ond Model 24B is o lighter duty omplifier which mode possible o reduction in size, weight ond price.

This projector employs the 500-wott lomp for illumination, hos o Rolo 10" dynomic speaker with 50-ft. cord ot-toched. The weight of the speaker in cose is 12 pounds ond projector in cose 33 pounds. This model occommodotes either 400- or 1600-ft. reels. It hos o ropid power rewind.

New Releases

●The release of fourteen one-reel motion picture episodes based on Old Testament stories is onounced by the Bell & Howell Filmosound Rentol Library. This non-sectorion 16mm sound-on-film series offers the following titles: "Creation"; "Coin and Abel"; "Nooh ond the Ark"; "The Deluge"; "Abrohom"; "Migration"; "Abrohom ond Lot"; "Isooc, the Boy"; "Ishmoel"; "The Sacrifice of Isooc"; "Isooc ond Rebekoh"; "Jacob ond Rochel"; ond "The Return of Jacob."

This series was produced in Hollywood under the personal supervision of Rev. Horwood Huntington. The narration, by Wilfrid Lucas, is based upon sound Biblical scholarship.

Each reel is independent of the rest and complete in itself, for seporote showings without reference to any of the others. However, the reels con reodily be grouped together into a continuous feature picture. For instance, six, seven, or more reels con be selected ond projected os o full evening's program.

Sound Subjects

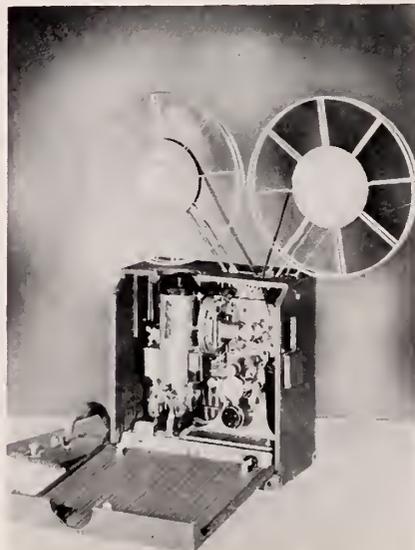
●Featured in Bell & Howell's lotest folder on 16mm Sound-on-Film Subjects is the 7-reel production "Torzon the Feorless," featuring Buster Crobbe.

In addition to this there is o Chorlotte Greenwood subject, any number of scenics, comedies, historical ond operologues, not to mention o listing of 19 Animated Cortoons.

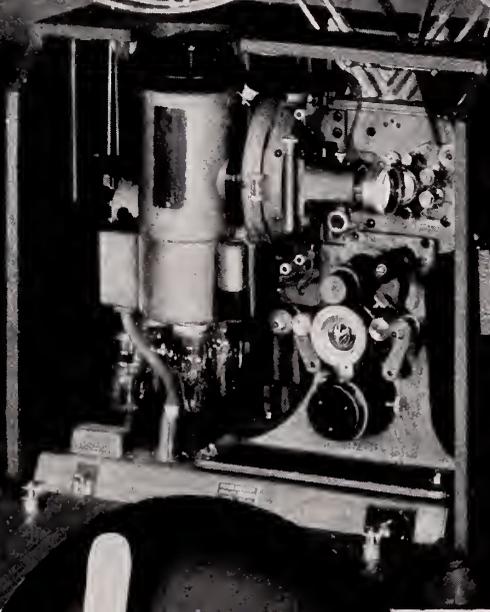
Photographic Annual

●It's always o pleasure to receive a new issue of the American Annual of Photography. The 1936 edition has just come to hond. To ottempt to review o work like this with time for only a

(Continued on Page 499)



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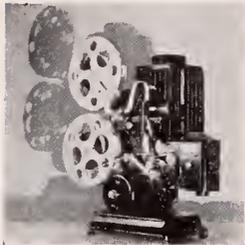


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Lighting the Long-Shot

(Continued from Page 486)

If we are alert to the opportunities afforded by the room itself, we can often improve greatly upon these simple effects. Look around you now: the lighting in a normal room is seldom flat, but composed of highlights and shadows from the various table and reading-lamps scattered about. The rounded contours of furniture are picked out by little catch-lights on the curving portions. Chairs and so on standing against the wall cast their shadows behind them, tracing decorative patterns which also serve to make them stand out from the flat surfaces. Curtains form definite patterns of light and shade, with their draped folds licking up light on the high points, interspersed with shadows in the recessed part of the fold.

Every one of these natural light-effects can be reproduced in a photographed long-shot. What's more, they should be, for it is these tiny touches that give character and naturalness to the shot. Almost always, you can arrange your lighting to suggest the natural light-sources of the room. Photofloods in shaded reading-lamps, table-lamps, and such fixtures can often duplicate the normal effects cast by these lamps. If the photoflood is not enough, one can nearly always supplement them by photographic units outside the camera-line, with their beams directed to the right places.

In many rooms, it is difficult to avoid shooting past doors leading to hallways or adjacent rooms. Ordinarily, these portals are just gaping black areas which distract the attention from the subject. But how do they appear in real life? Don't we generally see a well-defined fan of light coming through them from the next room? Well, if we want to, we can reproduce this effect, too. A regular photographic lamp will give us a strong, "hot" beam for such effects, if we have a lamp to spare for the task. If not, we can get a similar, and less obtrusive effect by simply planting a Photoflood in an unshaded socket such as a wall-fixture or chandelier in the farther room.

Another important service our long-shot lighting can do is to place the emphasis where we want it. As the writers on composition have pointed out, shadow-patterns, for example, can lead the eye from the foreground to the background, or wherever the important action may be. Similarly, too, if we keep the foreground lighting rather subdued, with the background lit more brightly, the eye will be attracted to the more brilliantly illuminated area. Combining these two ideas, it is possible to place the em-

phasis of any scene exactly where we want it.

In lighting any scene, there are two principal ways to work. You can work down from the high-lights, or up from the shadows. In the first instance, you begin by creating your highlights, and let the shadows take care of themselves, filling in here and there wherever it may be necessary to eliminate unwanted blotches of black. In the second method, you begin by laying down a general foundation of soft, flat front-light, which will preserve the detail in the shadows. Then you build up the high-lights from this, using stronger lights, or lights that are closer to what they illuminate. Either method is good; the latter, while probably the safest, calls far more lights as a rule than does the other.

There are several "gadgets" which can be easily built, and which are very useful in this sort of lighting. The first is the "nigger" or "gobo." This is simply a tall, narrow black screen, to prevent the light from some lamp from striking the lens. It is a strip of wall-board perhaps a foot or so wide by five or six feet high, painted flat black and supported by roughly built wooden feet. Another is a simple support for lamps you want to place on walls. If your room has a strip of moulding at the top, you can easily make a wooden frame (often a single board is sufficient) with a picture hook at the top, to hook over the moulding, and the lamp at the bottom. If you are a good carpenter, you could make such a frame H-shaped, hanging from two hooks, and with a movable bar at the bottom, pegged in place with dowels, so that the height of the lamp can be adjusted. Often, too, little utility lamps, made of dime-store sauce-pans, bread-pans, etc., with a socket and a Photoflood, will prove valuable in producing catch-lights on table and chair legs, and the like. Such lamps can easily be hidden on the floor, behind furniture, etc., doing very necessary work and freeing the larger lamps for other purposes.

Yet another very useful accessory is a "snout" or concentrator, which is fitted over your regular photographic units, and changes the beam from a wide flood to a more or less concentrated spot. The exact construction of the snout will naturally depend upon the type of lamp you use: in general, it is a hollow, truncated cone, fitted with clips at the larger end by which it is attached to the lamp's reflector. It is very useful in confining a beam to a specific area. It does not make a floodlight into a spotlight, but it helps mightily in producing "spot" effects.

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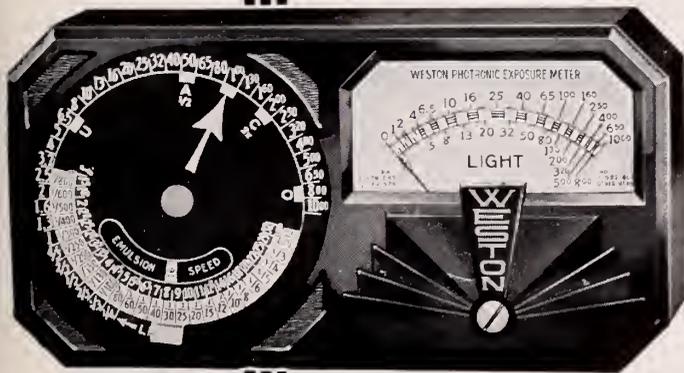
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Spectacle-Lens Macrography with the Special

(Continued from Page 490)

Sometimes when splicing scenes of designs or patterns, it may be difficult to tell which is the beginning and which the end of a strip of film. I have noticed, though, that on most kinds of film the manufacturer's name appears in the margin of the film, and apparently always on the same margin. By watching this lettering, you will never splice a scene in upside-down. Another help (except when you use negative-positive), is that most 16mm cameras photograph on identifying design in the margin, too: the Ansco, Bell & Howell, Ensign, Victor, Risdon, and Stewart-Warner make theirs in the right-hand margin (as viewed emulsion down, picture "head-up"), while the Cine Kodaks, the Nizo, Zeiss Kinamo, Movex and Simplex make theirs in the left margin. If you should happen to strike a film whose maker was too modest to put his name on the film, your camera itself can help you to avoid splicing a scene wrong-side to.

Sometimes, incidentally, it is actually desirable to cut a scene in backwards. There is always, of course, the trick of getting reversed-motion effects by shooting with the camera upside-down, and reversing the scene end for end when you cut it into the picture. Then, in cutting animal sequences, I have often found that a middle-distance shot showed an animal or bird facing in one direction, while the big closeup which was to follow showed it looking the opposite way. Such things can't be avoided when you are filming wild life; but splicing the closeup in backside-to remedies this. Theoretically, of course, as this puts the emulsion on the far side of the film from the projection-lens, it throws the picture slightly out of focus; but practically, I can't see that it appears on the screen as disagreeably bad focus.

While I am enthusiastic over the reflex finder of the Cine Special, I'll admit that there are some other features of the camera for which I have not found so much use. Every amateur wants to make lap-dissolves; but once you have a camera that can make them, you find you don't do so nearly as often as you would expect. I have tried numerous lap-dissolves, but the technique is rather difficult, I think—and whenever I did get a good one, it never seemed to fit when the film was cut. So my last film shows only one dissolve.

The fade-in and fade-out are useful, and easy. But they have their pitfalls: after one fade-out, I recall, I left the shutter closed and ran 125 feet of film through the camera before I discovered the error! Now when I fade out a shot

I immediately open the shutter before taking my hand off the lever!

Most of this article has been devoted to the camera: but I also use a Weston Exposure-Meter, and I've found it almost as important as the camera. Exposure-meters (even the best ones) have one thing in common with cameras: they say that neither will lie—but both cameras and exposure meters can be made to lie if we aren't careful about what we show them. For instance, your meter will lie like an old-school politician if you change from Pan to Superpan without changing the meter-setting. Also, be sure your meter-reading is coming from the object to be photographed, and not from the background. For instance, white rabbits against a dark background will make a liar out of the most accurate meter unless one holds the meter close to the rabbit. After all, the rabbit is the subject, and the background is secondary; but the meter has no brain, and can't make such distinctions. It will overage the two up every time unless you show it exactly what you're shooting for.

Incidentally, getting back to our spectacle-lenses, the meter will be useful in shooting with them. You won't have to learn any new tricks in exposure for making pictures with these auxiliary lenses, for the f-speed of the camera lens is not changed by the addition of the spectacle-lens. If the meter says f:8, f:8 it is, whether or not your camera is wearing spectacles.

Inside Workings of a Ship's Photographer

(Continued from Page 491)

although there is space provided between the blossoms for the lens. With a cable release, Tschira merely snaps his pictures at will, getting a steward to turn or move the vase slightly so as to aim the camera lens in the direction wanted. He claims this stunt works perfectly, and with it he has been able to get some unusual dining salon scenes which would otherwise prove difficult, if not impossible.

Next came a special Photoflash outfit equipped with two reflectors. This device is somewhat heavy, consisting of a metal box which contains the batteries, and upon which the Leica fits. Two metal tubes carry the wires from the battery-box to the lamps. These tubes curve upward around the camera, making a rather bulky affair. It is too heavy and bulky for amateur use, but it was designed primarily for Tschira's own use and for a few professionals who could

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use it in their work. For ship-board work, it is ideal because its weight overcomes ship vibration and thus permits clean-cut pictures to be made at relatively low shutter speeds.

What proved to be a most unusual, yet practical idea, was a leather belt device with shoulder-straps which could be worn on the person. The straps were fitted with packets and loops for the accommodation of several different lenses, a number of filters, ten rolls of film, and other small miscellaneous gadgets which often prove useful when out picture-making. Tschira's idea in designing this apparatus was to eliminate the bother of filling various packets with additional equipment. It likewise permits both hands to be free and unencumbered. The belt makes an ideal accessory for candid cameramen, for an overcoat can be worn over it thus concealing it entirely. Tschira has often worn this belt when in various parts of the world where picture-making is frowned on. On shipboard, too, it has proved its worth to him. This belt is not commercially available, nor are the other devices he showed me, they having been made up solely for his personal use.

When next you make a trip on a liner, investigate the ship's photographer. You will find him a most helpful guide to photography.

Wheels of Industry

(Continued from Page 494)

casual observation can hardly do it justice.

The reputation of this annual, however, is such that the photographic fraternity hardly needs to have it introduced to them with superlatives. It has hit a healthy and artistic stride which it has maintained these many years.

The 1936 Edition keeps pace with its forefathers. It is replete with fine illustrations from the cameras of the world's leading photographers.

Of course, it contains the usual quota of splendid informative material dealing with the many phases of photography from both its artistic and technical sides. Naturally it deals in several of its articles with color photography and does not overlook substandard motion picture film.

Film Speeds

●The Weston Electrical Instrument Corp. has issued a very interesting and valuable analysis of the speeds of the various films and plates commonly used in photographic work.

While the main body of this is given



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over to its relation in Weston ratings as used on the Madels 617, 627 and 650 Exposure Meters, still it has a conversion table on it for those who employ the Scheiner, Din or H & D ratings.

It gives considerable space to Kodachrome in both natural and artificial light.

Film Preservative

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camera man or amateur movie maker to his own film. The briefest announcement to the effect that these solutions were being prepared in the above manner, resulted in an immediate demand for these preparations from readers according to the claim of the manufacturer.

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Dishpan Into Floodlight

(Continued from Page 488)

Here's how the cost-sheet read:

1 17" tin dishpan	\$1.35
1 Switch .....	.15
1 Rubber-covered two-prong plug .....	.15
6 Bakelite lamp-sockets .....	.90
36 ft. wire, 4 ft. for 5c.....	.45

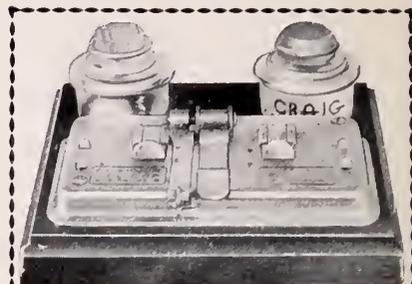
TOTAL

TOTAL\$3.00

In spite of being so predominantly a product of scrap-heaps and the five-and-ten, the flood-pan works surprisingly well. It throws a remarkably even flood of light over an angle of about 150 degrees. Checking with a photoelectric meter against the performance of one of the better commercial single-photoflood units, I found that the dishpan produced at close range (about 10 feet) slightly less light at any given point than did the commercial lamp—but it spread this intensity over at least three times as wide an angle. At a greater distance (25 or 30 ft.), the dishpan gave a very slightly higher reading than the other, lighting up the whole end of the room brilliantly. In other words the dishpan won't give six times as strong a light as the commercial single-lamp unit: but it will give almost as much light over three or four times as wide an area. Reducing this to practical, working terms, the pan-light, when you have to floodlight a large area, will take the place of several of the usual units, which can then be used for light-effects and modelling. But—don't expect it to take the place of three or four single-photoflood lamps with their beams superimposed!

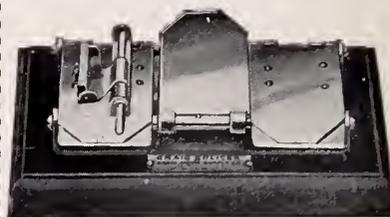
An idea like this is of course subject to infinite variation, according to what one has to work with. For instance, if you aren't blessed with an extra tripod, an old music-stand will make an even better support for the light. If the innermost of the stand's telescoping lifts is a piece of solid metal, you can thread the end, and fit the "Optipod" directly to that. If it is simply a light metal tube, you can either cut off the end, and solder a tripod-screw in place, or substitute a brass rod. Also, if you haven't an old tilting joint, you can get the same effect by cutting your base-block in two, fitting one half to the lamp, the other half to the stand, and holding them together with a horizontal bolt, a washer and wing-nut.

In some cases, you'll get a better light if you paint the inside of the pan with a good aluminum paint, rubbed well down; and of course the lamp will look better if you paint the outside with



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same dark color, such as black crock-a-loc.

The Phataflaad globes will last a good deal longer, too, if you add a bit to the budget and use a high-law switch, and only burn the globes at full strength when you are actually shooting. The handles of the pan can be bent up to hold diffusers, which can be made out of a waaden disc or hoop covered with white bolting-silk, tracing-cloth, or the like.

A smaller unit—or rather pair of units—can be made out of one of the light aluminum roasters sold in some of the ten-cent stores. I've seen some priced at around 90c, and you could put three Phataflaads into the roaster, and another three into its cover, and have a pair of very handy lamps. Some of the spun-aluminum mixing-bawls would also make nice reflectors. One of my friends recently made a very adaptable single-phataflaad clamp-on unit out of an old reading-lamp base and a ten-cent store sauce-pan. Another very handy unit, which would fill a considerable need for something that can be hidden behind furniture, to light up otherwise dark areas, could be made from a ten-cent bread-pan and a single socket. None of these lamps could hope to compete with the artfully designed commercial photographic lighting units—but they can, and will supplement them excellently. In addition, they give you the real thrill of making something yourself, and proving its merit in your own movies.

Putting Composition Into the Picture

(Continued from Page 487)

they were shot as two separate closeups, each would be good dramatic action. Once you have solved this simple riddle you will have many shots that fit into the picture.

Another simple method to try with the chart of lines and their relations to composition would be to arrange some still-life subjects on a table and using a cardboard mask with your aperture opening cut out in the center, then by looking thru the opening at different points or angles that the camera could take you will see that they are always related to each other in harmony as long as placed within the rules of the chart.

In order to study the emotion that lines can really give to the scene, if one has the time, it would be good to go near some railway tracks and shoot scenes around the movement of engines and cars. There is no end to what you can develop in dramatic action with a moving train. Standing on the tracks you will see the lines converge, and an

one side a post or trestle will lead the eye in another direction. As a line of cars passes by they will take up the same action, repeating the same movement. Get a closeup of wheels turning, cut the shot from below and the angle of the lens will throw the lines into radiation, if you pan with this shot you have set up another emotional group of lines that will have its dramatic meaning, and will always be in relation to what has gone before. It is good to speed up your film when shooting any thing that is in fast motion such as a moving train, and this is very important when shooting people moving in the background as they are not aware that they are being taken so their movement would appear too fast or jerky.

Next month I will give a few examples of trick shots made around abstract line movements with the method they were arrived at, also a breakdown of a script that was written for all the tricks and angles a camera can do without using the human figure. When we have been able to make pictures around lines we will make better pictures with actors, we will know how they fit into the scene in relation to line, form and balance.

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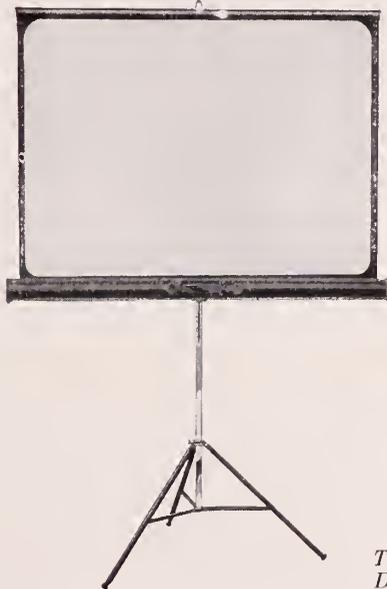
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Cinematography an Eclipse

(Continued from Page 489)

For the next exposure, I had to do the whole thing over again. Due to the movement of the earth, the image of the moon had moved a very small fraction of an inch across my finder. That meant each time I made an exposure, I had first to center the image of the moon in the finder if I expected to have a picture that was steady on the screen. After doing this for two or three hours, you can certainly envy the professional astronomers who have telescopes equipped with a clockwork drive that automatically follows the moon, keeping it perpetually centered in the camera without any trouble to the photographer!

Now, as I said before, the moon was covered when I started to make this picture. By the time I had made my first exposure and had centered the moon in my finder for the next frame, the moon had begun to move out of the shadow cast by the earth. This brought up another question of light. No two frames were due for the same exposure-time, for more of the bright part of the moon would be visible each time. Each frame would have to receive a slightly shorter exposure than the one before it. Here again I had to take a chance. For each frame exposed, I shortened the exposure-time by one second. The first frame received one minute and thirty seconds; the second received one minute and twenty-nine seconds, and so on until the moon was completely clear. The last few exposures, when the moon was completely uncovered, were one second each.

I kept this up for three and a half hours. I do not regret one minute of the time I spent doing it. My only regret, in fact, is that I didn't think about filming sooner, so that I could show the whole eclipse, rather than just the latter half. As it is, my film is a little more than nine feet in length. When projected, it compresses action that actually took several hours into the space of a few seconds. The picture, as can be seen from the illustrations, fills about one-third of the screen, and is perfectly clear.

In any "time-lapse" filming of this sort, you can control not only the total duration of the film on the screen, but also the apparent speed of the action by the interval between each one-frame exposure. If the interval is short, there will be more frames, more footage and more screen-time, while since there is less change between frames, the action will apparently be slower and smoother. If the interval is longer, there will be fewer frames and accordingly shorter screen-time, while as the change between frames is greater, the action will seem faster.

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A really rigid tripod is a necessity—and even so, you will have to work very carefully to make sure you don't accidentally jar the camera out of line between or during the exposures. A hand-cranked single-frame movement is vital if you are going to photograph a subject which, like this eclipse, requires fairly long time-exposures. It is also a great help (especially with telephoto

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The Contest is open only to Amateurs. No professional cinematographer will be eligible to compete.

The Contest ends at midnight of November 30th, 1935. All pictures must be received by the closing date or they will not be considered.

Pictures Submitted in this contest will be judged for photography, composition, direction, acting, editing and entertainment value. The judges will include outstanding and widely known cameramen, directors, actors, writers and a group of nationally known motion picture critics.

The Decision of the judges will be absolutely final and there can be no appeal from their decision. Announcements of the awards will be made as soon after the close of the contest as possible and checks and prizes will be sent the winners.

Pictures may be submitted either by individual amateur cine filmers, or they may be submitted by amateur

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The Motion Picture CAMERA Magazine



December,
1935

Published in Hollywood,
by
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this issue

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. . . and other features

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Next Month

● Dr. Herber Meyer will give us another comprehensive and instructive article on the laboratory side of the motion picture business. We will also have a fine contribution from the head of one of the camera departments of a Hollywood studio on Standardizing Camera Equipment.

● Naturally there will be a pen picture of one on the leading Directors of Cinematography and other contributions by members of the American Society of Cinematographers.



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Actual blowup of a 35 MM. frame taken on Agfa film by Bernard R. Hubbard, S. J., famous Glacier Priest.

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RECOVERY from the depression is clearly indicated by the number of technical advances chronicled during 1935. In addition to a multitude of detail improvements, the year brought forth a number of advances of a basic nature; and although there was no change as radical as the introduction of Panchromatic film and Mazda lighting, or the advent of sound, none the less, certain of the year's innovations foreshadow sweeping changes which may logically be expected in the relatively near future. 1935 has indeed been a productive year.

Methods

There has been a marked tendency toward longer production-schedules and more generous budgets, permitting—if not actually demanding—the exercise of greater care in the technical departments.

There was also a definite increase in the number of location-made "Class A" productions, and in the utilization of bona-fide exterior scenes rather than stage-built exteriors or process shots.

Although, for various reasons, the Technicolor 'boom' which, early in the year many expected to follow the release of "Becky Sharp," the first three-color Technicolor feature, did not materialize, the later months have seen a revival of interest in all-color films, with several in production, and at least a score projected for the coming season. Abroad—especially in England—enthusiasm for color is reported at a high point.

In several studios definite progress was made toward standardization of photographic equipment.

Influence of Foreign Elements

The influence of foreign elements was not as marked as it has at times been in the past. Production in England made notable advances, economically, artistically and technically, drawing heavily upon Hollywood for expert technicians of all kinds, especially Cinematographers, special-process technicians, and make-up artists.

The tremendous interest in natural-color cinematography shown by the British film industry is directly responsible for the creation of a British branch of the Technicolor Corporation, and indirectly is undoubtedly an accelerating factor in the revival of Hollywood's interest in color.

Raw Materials

Eastman introduced "Super-X" Panchromatic negative film. This product, which was originally intended for use in photographing "transparency" or projected-background process composites, has come into general use for production camerawork. It is rated as 40 per cent faster than the previous Super Sensitive emulsion, with slightly different color-sensitivity characteristics, and requires an average of 2 minutes longer development.

Agfa introduced a 35mm. reversal-type Panchromatic film, of excellent characteristics. This product was intended primarily for the making of background-projection "key plates." However, due to the general need for post-development control of the density and contrast of these keys, the film has not been commercially used to a great extent. It is, however, spreading into the miniature-camera field with considerable success.

Agfa also introduced "Finopan" negative film, a medium-speed, fine-grain Panchromatic emulsion which is meeting considerable success as a film for transparency-background keys.

The Agfa firm likewise introduced an Infra-red sen-

sitive film which has been excellently received, and "Portrait Superpan" cut-film for 'still' photography.

The introduction of "Kadachrome" and "Dufaycolor" color-films (the former available only in 16mm., the latter in 16mm., 35mm., and roll, pack and cut-film) was of considerable importance.

In the substandard cinefilm field, aside from the advent of Kodachrome, Bell & Howell's introduction of pre-split 8mm. "Filmopan" was the greatest innovation.

Pellex introduced what is claimed to be the fastest Panchromatic emulsion yet produced in "Super-Pellex," which is given a Weston-meter speed rating of 50 for daylight and 40 for tungsten light. In common with all Pellex-films, it is of the reversal type (16mm.) and coated with the "Triplex" anti-halation backing, a part of which is left after processing to reduce projection-flare.

Cameras

The Twentieth Century Silent Camera, developed by Graver Laube and others at the 20th Century-Fox Studio, was probably the outstanding camera development of the year.

In the substandard field, Bell & Howell's "Straight 8 Film," using pre-split 8mm. film, set up a new 8mm. standard.

The Fearless Camera Co., of Hollywood, produced an interesting custom-built professional type 16mm. sound on film camera.

Abroad, the Zeiss "Movikon" exhibits many excellent features, especially a built-in range-finder coupled to the lens after the fashion of a miniature-camera, and the Siemens and others introduced inbuilt photocell exposure-meters interconnected with the diaphragm controls.

Accessories

The most startling innovation in this category was the development of the Eastman "Pola-Screen," a device for controlling glare, reflections, etc., by polarizing light.

Improvements in blimping were noted at Warner Bros. and Metro-Goldwyn-Mayer studios, and various forms of synchronizing lens and finder for follow-focus shots came into general use.

Metro-Goldwyn-Mayer developed an intermediate-sized camera-crane adapted to location work and high-speed transport as well as to studio use.

The Fox-Fearless "Velocitor" became standard equipment in many studios here and abroad, replacing tripods and earlier types of small cranes.

Lenses

Bell & Howell introduced a new super-speed lens for professional use, the new Taylor, Taylor & Hobson "Cooke" f:1.3 "Speed Panchro."

Lighting

With faster films in use, there was a marked tendency toward the use of fewer lighting-units, but more efficient ones, and simpler lightings. The Arc made notable gains

Technical

Progress in 1935

in monochrome cinematography, due to the introduction of more modern equipments.

Mole-Richardson introduced the "Junior Solarspot," a Fresnel-lensed 2,000-watt unit producing a remarkably even beam of high power, which is rapidly supplanting the 18" parabolic-mirror reflector sunspot. A similar 5000-watt unit known as the "Senior Solarspot," is being introduced as this goes to press.

The same firm developed a Fresnel-lensed Arc spotlight known as the "HI-Arc," which is rapidly superseding both the 80 Ampere rotary-carbon condenser spotlight and the 24" (reflecting) Sun Arc. Although developed primarily for color cinematography, this lamp has been extensively used in black-and-white productions.

The "Vitachrome," an interesting, double-reflecting portrait lamp (1,000-2,000-watts) was introduced by A. C. Jenking.

Two high-power professional Photoflood units were introduced for industrial and location use. They are the "Artreeves," made by the Hollywood Motion Picture Equipment Co., and the Mole-Richardson "Cinelite."

In the amateur field, Lights, Inc., and Bell & Howell made available a range of aplanatic (faceted) metal reflectors for use with Photoflood globes.

Process Cinematography

No basic developments were noted, though many detail improvements were made by individuals and studios. Several films, released or in production, include unusual special-effects problems. Among them may be mentioned "The Last Days of Pompeii," "The Invisible Ray," "Peter Ibbetson," "A Midsummer Night's Dream," "Transatlantic Tunnel" (British), and "The Shape of Things to Come" (Also British).

Natural-color Cinematography

Professionally, the major interest in color is centered on Technicolor's three-color process, the only 3-tone method commercially available; but a considerable amount of undercover development work is under way by both studios and color-firms. With both "La Cucaracha" and "Becky Sharp" showing sufficient financial success to warrant the added expense of color photography and laboratory work, several American firms—notably Pioneer, Walter Wanger Productions, and Selznick-International—have scheduled a large group of color features for early

production. The number will probably total nearly a score. Abroad, Technicolor is erecting a plant to handle negative development, daily and release printing in England, and Alexander Korda's London Film Productions is reported to be planning an entirely Technicolor programme as soon as facilities are available, with other producers likewise interested in using the process.

With major-studio interest centered in Technicolor, Independent producers and makers of short-subjects are giving various two-color processes a new lease on life. Coincidentally come improvements in some of these systems which, had they occurred before the commercial advent of three-color cinematography, would have been of front-rank importance. Among these are the use of single-coated prints and dichroic dyes by Cinecolor and the Dunning Tri-Tone process, the introduction of the Harrison Multichrome System and the Gilmore system, both of which produce two color-separation negatives on a single film by use of optical units which divide the picture into two half-size images, rotated 90° and occupying one normal frame; printing is done optically, with the images restored to normal size and position, superimposed and colored subtractively. The results are said to show greatly improved definition and color-values.

Regal Productions are producing a programme of 8 Independent features in Consolidated's "Magnacolor" (Bipack) process, and a number of shorts, Spanish-language features, etc., have been made in Vericolor and other similar processes.

In the substandard field, Eastman's new "Kodachrome" 16mm. process (not to be confused with the earlier, 2-color process of the same name abandoned many years ago), is undoubtedly the outstanding achievement. This is a monopack, three-color subtractive process, involving the use of a multilayer film and intricate laboratory processing, but imposing no special requirements in taking or projection. It is understood that intensive research is under way to transform this reversal process to one which can be used professionally.

Almost simultaneously, Dufaycolor was introduced. This three-color process makes use of a ruled mosaic color-screen, and the material is available for 35mm. and 16mm. Cinematography and for many types of still photography. It is understood that some professional productions using Dufaycolor sequences have been made in England.

Stereoscopic ("Third Dimensional") Cinematography

Nothing of any commercial importance has been done in this field, though it is known that several studios, among which may be mentioned M-G-M and Universal, have conducted experiments with various processes behind locked doors. At the Fall Convention of the Society of Motion Picture Engineers, an experimental stereo process involving the use of polarizing spectacles similar to Eastman's Pola-Screens, was demonstrated. M-G-M released a Pete Smith novelty short-subject entitled "Audioscopes," in which a third-dimensional process securing the effect by complementary-colored images and spectacles, was used.

Film Standards

In the United States, five dimensional standards are well established. The professional standard of 35mm. film, with the so-called "Academy Aperture" and a standard .084" sound-track, is well known. In the amateur and non-theatrical fields, two 16mm. standards apply: the

Continued on Page 523

Problems of Controlling Correct Photographic Reproductions

by
Doctor Herbert Meyer, A.S.C.

SINCE THE INTRODUCTION of sound, it has become essential for any one engaged in the technical end of the motion picture industry to acquaint himself with the nomenclature of photometry. Characteristic curve, straight-line portion, toe, shoulder, gamma and latitude are common expressions exchanged and debated by cameramen and laboratory technicians, and become important practical units or factors in the discussion of photographic possibilities and results.

Still, however, while not underestimating the value of progressive technical education which lies in the popularization of certain fundamentals from the field of photometric science, it should not be overlooked that the conception of these laws and terms by the average person is not based on actual knowledge as to their evaluation, exact meaning and limitations, but is rather purely that of simplified tools or methods which are valuable in a practical way for the aid they offer in obtaining quicker results or greater accuracy and consistency.

As an example, we refer to the common practice of reading densities and plotting a sensitometric curve. This is a simple procedure performed by any one who is familiar with the manipulation of a densitometer and with the printed form of the graph paper. It is doubtful, however, that many would be able to explain the principle of this densitometer and its inherent limitations or to plot a density-lag exposure curve of correct proportion on a plain sheet of paper, necessitating knowledge of the relation between density increase with exposure progression.

The above would justify attention to the fact that standardizing and mechanizing aside from its usefulness carries in itself the danger of releasing man from the necessity of creative thinking and substitutes a "taken for granted" attitude which undoubtedly would retard general progress. It is interesting in this instance to recall the enormous part played by the American radio amateur in assisting that industry to its present efficiency. Not satisfied with only turning a knob on a receiving set, the amateur participated in building his own equipment and thus accumulated experience and knowledge that was utilized with great success by the commercial manufacturer.

After years of experience in the manufacturing of raw film and also in consumption in the practical field, the writer is aware that the consumer, represented by the camera and laboratory men, should know these products even better than the manufacturer, who in this case sells his merchandise practically without visual inspection. It is, therefore, equally logical that a large proportion of creative advice towards improvement of the film product should be contributed by the practical man on the basis of both his intimate knowledge of products and his consciousness of the consumers' current problems and future needs.

Fortunately, this has been the case and has resulted in much constructive advice which has been instrumental in assisting the film manufacturer to improve the quality of his products. The writer feels, however, that the effectiveness of the camera and laboratory men in this instance could be greatly increased if both had a deeper and clearer technical conception of the photographic principles underlying their practical experience and daily work.

The following articles are written with these thoughts in mind and might aid one or the other in widening his understanding of photographic terms and laws.

The fundamental law governing faithful photographic reproduction of natural objects is expressed by two equations:

$$\begin{aligned} 1. \quad C_n \times C_p &= C_o. \\ 2. \quad C_a &= 1. \end{aligned}$$

Wherein C_n represents the contrast or gradient of the negative emulsion, C_p that of positive material, and C_o the overall contrast in the final print.

It follows from these equations that:

$$C_n \times C_p = 1.$$

A variation of this law is better known in laboratory practice which quotes:

$$\begin{aligned} \text{Gamma Negative} \times \text{Gamma Positive} &= \\ \text{Overall Gamma,} & \\ \text{or} & \\ \text{Gamma Negative} \times \text{Gamma Positive} &= 1. \end{aligned}$$

This version plays a substantial and well-known part in the field of sound recording and reproduction especially when applying the variable density method and straight line recording. In pictorial photography, however, this simplified equation is practically useless as it does not answer the question of exact reproduction for the reason that gamma refers to the straight line portion exclusively, while a considerable part of the photographic reproduction utilizes the curved-toe portion of the positive film as it is necessary to render clear highlights in the finished print. Hence, it is essential to apply the general equation as given above in which the overall gradient equals unity and which takes into consideration every part of the gradation including the curved portions.

In laboratory practice the terms and utilization of gamma values have been introduced principally as a means of controlling the constancy of development and developing solutions. Experience, however, has taught the laboratory man not to rely on gamma values alone, but also to check and protect uniformity of density level in development by reading individual density tabs in connection with every gamma test, one of which, as a rule, is a low density located in the curved-toe section of the characteristic curve as applied to positive film. These tests, no doubt, serve as a means of not only keeping the gradient of the straight-line portion constant in the developing procedure, but also of preserving the shape of the toe section which in combination represents a fairly accurate method of protecting



ARTHUR EDESON, A.S.C.

An Etcher of Character

---is Arthur Edeson

by
Harry Burdick

SOME TWO DECADES BACK, Arthur Edeson was holding enviable rating in the fore-rank of photographic portraitists of the nation. When he graduated to the wider realm of cinematography, he took with him a priceless heritage—the well-nurtured gift of pictorial character delineation.

This sharpened talent has stood him in good stead throughout his many cinematographic adventures. It is the underlying fundamental of his camera conceptions. It directs him to lens characters instead of actors, dramatic action rather than individual posturing before sets. It goes far to explain why Edeson has been entrusted with more millian dollar productions than any other practitioner of screen camera craft.

It provides explanation, also, for the subtle charm and

the epic sweep of artistry that permeates his every screened work. It accounts, too, for his amazing versatility, the flexibility of his camera technique to accommodate dramas of so widely divergent content as "All Quiet on the Western Front," "Frankenstein," "Mutiny on the Bounty," "In Old Arizona," "Ceiling Zero," to itemize a few works of differing concept.

He has placed on celluloid an astounding variety of stories. Each new assignment, it seems, takes him into uncharted paths of endeavor. But regardless of the scope or nature of the plot to be unfolded, his underlying talent at true and sincere character portrayal prevails.

There is no betraying earmark of sameness nor monotonous stereotyping to his steady stream of successful screenings. His treatments are as varied as the stories themselves; each in close keeping to the particular narrative. Indeed, story wholly governs his procedure.

Blessed with a deep story sense and drama valuation, he goes about his work much as would a novelist or playwright, but with camera rather than pen as his vehicle of expression.

Establishment of exact mood paints in his emotional atmosphere and level. Then he deftly captures character and characters on his negative, recounting his dramatic tale through precise development of character as the story carries on to climax.

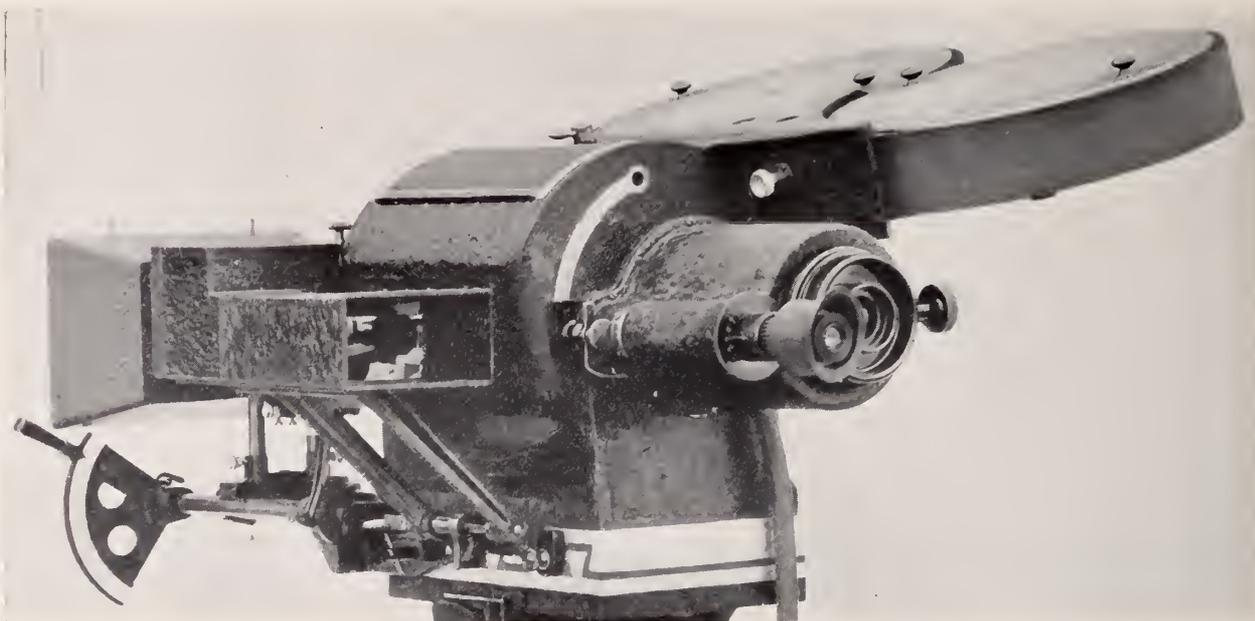
He gives painstaking attention to detail, before and during actual shooting. Days are devoted to thorough consideration of the cinematographic mechanics involved. This intense preparation done, he calmly and patiently "makes pictures."

His recent "Mutiny on the Bounty" is instance of his deliberate insistence on technical and dramatic perfection. This historical opus was twenty weeks in the making. It presented cinematographic difficulties in quantity to contribute jitters to the most poised artist. It was the most difficult from physical obstacles of any picture to his record.

Shooting was done in a land-locked bay at Catalina. As no land must show and so destroy the illusion of a ship far at sea, he could direct his camera only in one general direction. Now came the disturbing element. The good ship, "Bounty," had to be in position into the wind so that its sails might be filled. And the wind, day to day, as sea breezes will, changed about in prankish fashion and would never blow in the same direction two days running; or even throughout a full day, for that matter. Hence, Edeson encountered one of the toughest lighting problems on record. He would have blinding blue skies, or gray, foggy skies. The light and color of the sea, of course, changed correspondingly. He had white sails against white and gray skies. He had characters to light and costumes to convey. In addition and just to make his cup of troubles full to the brim, he was using not more than a 40mm lens throughout, that the "Bounty" might seem small as possible.

Because of all the confusing factors, it became one of the most exacting filtering undertakings one can imagine. How well Edeson solved his myriad technical problems and emerged triumphant over variable elements is demonstrated by the accolades of high praise from reviewing critics sitting before his projected photography.

From these puzzles of purely nautical nature, he turns to his current production, "Ceiling Zero," a Warner Brothers epic treating of air mail dramatics. Throughout this document, menace is furnished by fog; thick, soupy fog always



Innovations Mark New 20th Century Silent Camera

COMBINING many radical innovations in design with well-considered practicality, a new silent camera has been developed by the cinetechnical staff of the Twentieth Century-Fox Studio. At first sight, the camera appears essentially to follow the accepted school of American studio-camera design; but upon closer inspection it becomes evident that although all of the accepted components are present, they are assembled in a decidedly unconventional manner, and further examination reveals a definite, practical reason for each departure from orthodox practice. The obvious question about any silent camera is answered, in the case of the Twentieth Century Camera, by the statement that it has already been used on an entire production, ("Show Them No Mercy") unblimped, and at times within two feet of the microphone.

The development of the new camera might be described as something of a community project. Conceived and built under the guidance of Grover Laube, head of the Studio's cinetechnical department, patent-office records list, in addition to Laube, Charles Melvin Miller, Robert C. Stevens and Edward Albert Kaufman, all of the studio's precision cinetechnical shop, as the actual inventors of the camera; but they are unanimous in paying tribute to the cooperation and practical suggestions received from Camera Executive Godfrey J. Fischer and his staff of Cinematographers. It is a remarkable evidence of the spirit prevailing at the studio that the research and development work of this project was undertaken privately by these individuals, and that save for the actual materials used, the completed camera had no charge against it when it was presented to the company.

The general layout of the Twentieth Century camera adheres essentially to conventional American practice. That is, a four-lens turret is used, a durable metal box houses the camera mechanism itself, and is surmounted by

dual, external film-magazines of 1,000 foot capacity, while the driving-motor is mounted at the rear. Access to the mechanism is through a door on the left-hand side, at which side is also mounted a finder interlocked with the focusing mechanism and automatically correcting for focus and parallax.

The camera housing, however, is cylindrical in shape, rather than square. This is due not to any intention to be causelessly novel, but to the fact that this shape is best suited to the rotating focusing shift employed. The cylindrical case is mounted on a yoke-shaped base, and in focusing rotates on the axis of the main shutter-shaft. This rotation brings the focusing microscope into place between the lens and a fixed eyepiece at the rear. Both of the bearing surfaces upon which the housing rotates are completely enclosed, and thus protected from dust and

by
William Stull, A.S.C.

grit which can not only cause wear, but at times obstruct the full movement of an unprotected shift. Positive, cushioned stops limit the travel of the shift, and prevent both jarring and misalignment. The eyepiece, incidentally, is adjustable to suit the eyes of the various members of the camera crew, and is calibrated for easy adjustment. A secondary advantage of the rotating focusing shift is the fact that the movement may be reloaded or inspected by the assistant without interference with the focusing operation.

A conventional disc type shutter is used, with an aperture of 200°. The movement, which employs registering pilot-pins, is characterized by a remarkably even action. This movement was designed only after exhaustive analysis of the take-down mechanisms of the principal types now in use. Fig. 1 shows curves representing the velocities of the take-down pins in the new camera contrasted with a composite curve representing an average of several types now in general use. It will be noted that although the take-down of the Twentieth Century camera takes place in a relatively brief period, it is uniform throughout, and does not attain at any point in the cycle an unduly high velocity. The peak velocity is approximately 73 inches per second, while in some conventional designs the velocity not only reaches a peak of 98 inches per second, but peaks very sharply. The take-down pins have absolutely no vertical movement at the moment of engagement and disengagement, though in some commercially used types the pins enter and leave the perforations while still possessed of considerable vertical velocity—i.e., moving in an arc rather than straight into and out of the perforation. Due to these characteristics of straight-line engagement and disengagement and uniform acceleration, it has been possible to shape the take-down pins very accurately, giving both the moving pins and the registering pins a very precise fit in the perforations, and assuring the maximum of accuracy and steadiness.

Silence is secured by this uniform action, by minimizing gearing and the weight of moving parts, and by giving the film as nearly free a path as possible. No sound-proofing other than the conventional black velvet lining is used in the camera, the aim of the designers having been to prevent the cause of noise, rather than the effects. Magazine noise is minimized by affording the film free passage, eliminating contact between the edges of the film and the walls of the magazine. At present, specially rebuilt magazines of conventional type are fitted, but an improved type is being developed. A special locking spool is used, fitted with an ingenious, but easily operated lock which holds the spool rigidly to the shaft. The take-up drive is by belt from an internal clutch. The varying size of the film-roll is compensated for by this clutch, rather than by slippage of the belt. For this reason, when the camera is in operation, it is said that the action of the take-up drive appears deceptively slow.

Provision has been made to use a wide variety of standard driving motors. The present equipment is powered with a standard 1440 R.P.M. synchronous motor, the stator field of which may be shifted to synchronize with the projectors used in background-projection process cinematography.

The monitoring finder is of the conventional type,

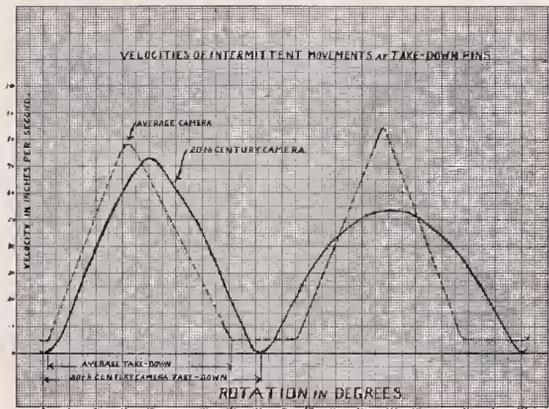
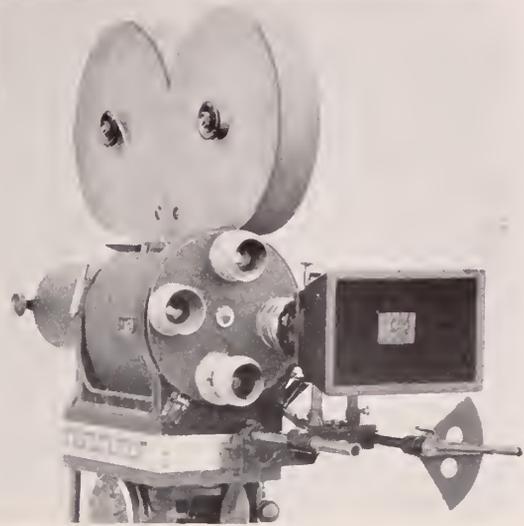


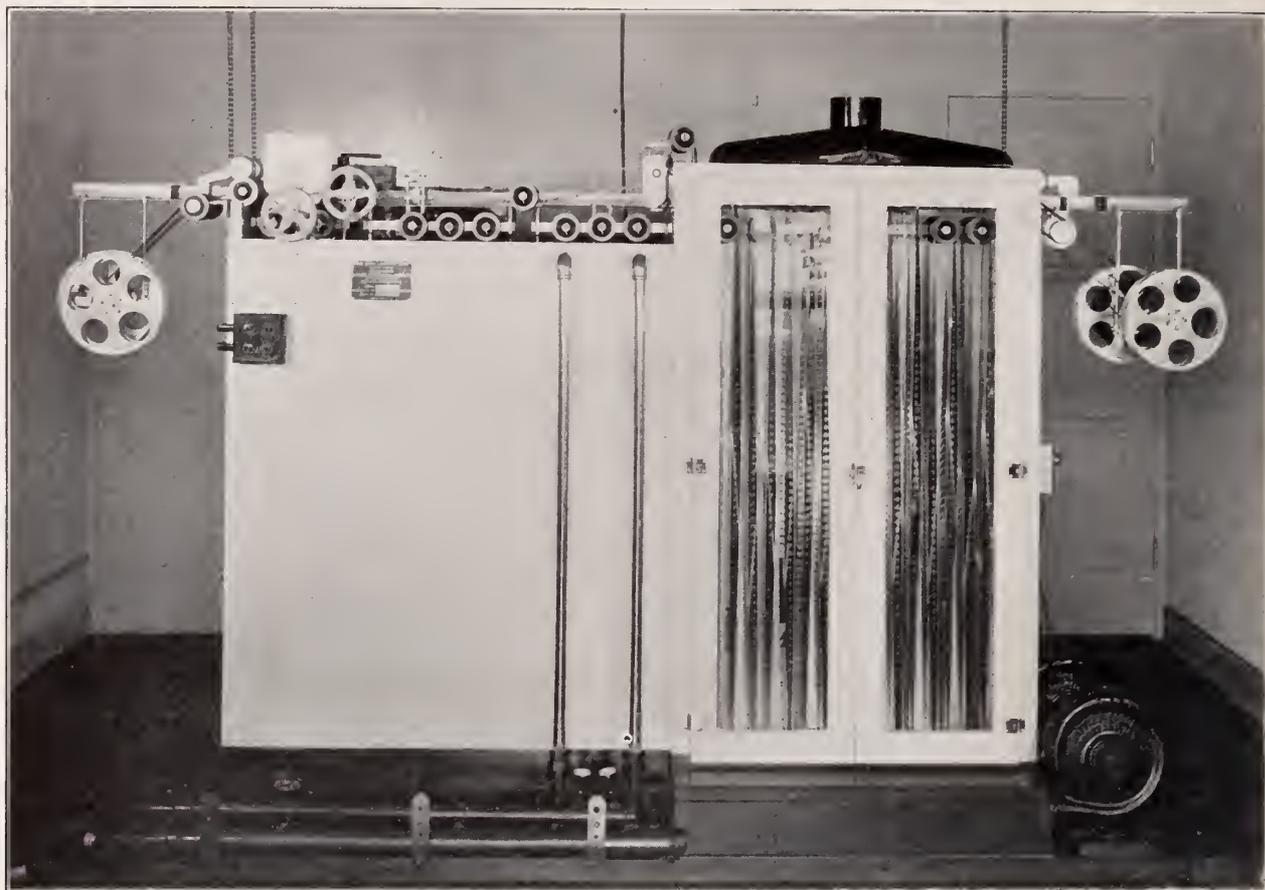
Fig. 1

interlocked with the lens-focusing mechanism to correct for focus and parallax. In the latter movement, however, it differs basically from routine practice. Instead of securing the parallax-compensating adjustment by swinging the entire finder on an arc, the compensation is made by a lateral movement of the finder-lens, which may be roughly compared to the sliding front-board of a still camera. The designers state that this method eliminates a number of inaccuracies inherent to the conventional pivoted compensating movement. A release button on top of the finder throws the lens back into normal (or distant-focus) position when it is desired to make a quick check of the distant field covered, as in a follow-focus shot.

Due to the compactness permitted by the rotating focusing shift, the finder is mounted in remarkably close proximity to the photographing lens, further simplifying the problem of finder-parallax. Due to the close relation of the finder and the photographing lens, a specially wide sunshade is used, shielding both objectives.

The focusing control follows the pattern familiar at the Twentieth Century-Fox studio; a quadrant and lever mounted on the left-hand matte box arm carrying the focusing scale and control.

An important feature of the new camera is the fact that a single focusing scale suffices for all lenses. This



Complete Laboratory in One Unit

Editor's Note: Believing that a communication just received from George Schneiderman might strike a responsive note among many other cinematographers who possibly have encountered the problem faced by Schneiderman, we are printing his letter on a "One Man Laboratory," which he has discovered. Schneiderman has been in the motion picture business for more than 25 years in the photographic branch of the industry. For fifteen years he was with John Nicholas in the New York Universal Film Co. laboratories. He erected the first laboratory in the tropics, constructed in Kingston, Jamaica, in 1915. He operated the release print laboratory for Fox Film Co. in New Jersey from 1915 to 1917, and was in charge of Fox West Coast laboratories from 1917 to 1923. Since that time he has acted as a first Cinematographer with the Fox Film Co.

"AS YOU ARE already aware of my intentions to make pictures in foreign countries where laboratories are not established, it was necessary for me to either build or have built a developing machine for the processing of my film.

"I gave considerable thought to the possibilities of going back to about fifteen years, to what is known in the industry as the rack and tank development. This, however, in view of the fine and great developments made in the industry in all of its branches, seemed like saddling a venture not only with a hardship, but with something that

by
George Schneiderman, A.S.C.

did not pass the efficiency that is now being enjoyed by all makers of pictures.

"In my intensive search to find a machine that would meet my requirements, I feel I was fortunate in locating Hugh H. Gwynne, who has, in my opinion, designed and built the only practical developing machine in existence for my purpose and possibly the use of many others who require small but efficient units, in fact a machine that can be operated by one man, which gives it its trade name of "One Man Laboratory."

The following specifications will give any experienced cinematographer or laboratory man a more comprehensive idea of the utility of this "One Man Laboratory."

"Developing time for positive is adjustable to run from one to four minutes, manufacturing from five hundred to two thousand feet per hour. Negative film has a capacity from two hundred to nine hundred feet per hour.

Continued on Page 525

Destroying Pompeii— in Miniature

by
Edwin G. Linden, A.S.C.
as told to
Wolter Blanchard



Enlarged from one of Linden's tests. The temple and city are on one glass, the volcano on another, while the smoke is projected. In this test, the smoke was 1/32 of an inch out of correct alignment.

IT IS OBVIOUS THAT to be of any value to a production, miniatures and other special-process or "trick" shots must look real, lifelike and natural. Equally important, though not so universally realized, is the fact that they must also have feeling, maad and balance. Special-effects scenes must maintain the same artistic standards as the production into which they are cut; in other words, the special-process cinematographer must make his scenes a perfect match for those of the production cinematographer. The more thoroughgoing this cooperation is, the better will be both the process scenes and the production as a whole.

Technically, of course, special-effects work is based on paying infinite attention to details. One of the most important of these details is absolute rock-steadiness in every phase of the shot. Especially where there are a number of exposures superimposed to form one scene, the slightest "jiggle" or movement in any one exposure will ruin the entire shot. We had one scene in "The Last Days of Pompeii"—the long-shot of the destruction of Pompeii by Vesuvius—which required seven exposures; two were made at six times normal camera-speed; one at ten times normal; three were stop-motion exposures; and the seventh was a normal 24-frame per second shot. In any of these exposures, camera-movement, or even vibration, which would pass unnoticed in a normal shot, would have ruined the entire job.

Due to the extreme care with which the cameras were conditioned, tested and tied down, and the film handled, we were fortunate in having to make but one "take" of this shot. As an illustration of the super-critical pains which must be taken in this sort of work, I might mention that we had to keep people from even walking across the stage-floor while we were shooting! Ordinarily, a well-constructed stage floor would be regarded as a pretty solid piece of construction—but our tests showed that ordinary, middleweight footsteps walking across the floor produced enough vibration to endanger our shot. Therefore, when we actually made the scene, we had the stage roped off so that nobody but the crew actually working the set could approach within thirty feet of the cameras.

One of the first tasks in making this scene was to film the smoke which you saw (or didn't you?) rolling out of the crater of Mt. Vesuvius, and the threatening clouds which frowned over the city during the eruption. The smoke and the clouds called for rather different effects,

so they were made separately. In the case of the smoke, we photographed it in several different ways, at speeds ranging from four to twelve times normal, and in shades ranging from black to white, and from just a thin, lazy wisp to a magnificent roaring volume.

Thousands of feet of negative were exposed on smoke alone (you know at 700 feet or more per minute, it doesn't take long to run up a lot of footage). Then we would get into a huddle in the projection-room and pick the best takes to use in our composite shot. You'd be surprised how much argument there is in just smoke!

The burning boat in the foreground in some of the scenes was not a miniature, but like the foreground water in other shots, was made normally, at San Pedro.

The city itself was largely done on glass, while Mt. Vesuvius was another glass.

Some of the flames, too, were high-speed miniatures.

In bringing the whole thing together, we had a rather intricate problem. For different sequences, the city of Pompeii had to be photographed with varying effects, representing day, dusk and destruction. The first required a bright, sunshiny effect, with the foreground water calm and bright, and the smoke from Vesuvius rolling lazily, almost imperceptibly. Then the appearance had to be changed to dusk, with lights and a glow from the volcano. Finally, the scene had to be changed entirely; Vesuvius, as you remember, had to do its stuff. The city had to take on a murky hue, the foreground water had to do some tossing about, and over the city a cloud of ashes was requested by the Powers that Be. (Mind you, the ashes must look like ashes—but mustn't obscure the picture!)

In assembling these various ingredients, the city and the volcano, which were glass paintings, were lined up in their proper relation. The smoke, the clouds, and the foreground-water were projected into their proper places by stop-motion background projection, and the flames—well, some of them were also projected in, and others were painted in on yet another glass, carefully lined up with the others. Of course, partially-silvered mirrors were employed in some instances, to simplify the physical group-

Continued on Page 522

Innovations Mark New 20th Century Silent Camera

Continued from Page 517

is made possible by a unique lens-mount, the invention of Messrs. Laube and Kaufman. Essentially, this lens-mount consists of three collars: the outer collar, attached to the camera, the inner collar, attached to the lens, and an intermediate collar which acts as a cam to provide the focusing movement. The lens itself does not rotate, but moves straight in and out. It is supported firmly at both ends of the mount on sliding bearings: the inner end being supported by the inner end of the inner, or lens-carrying collar, fitting into the outer collar, while the forward end of the collar is supported by several small, renewable bearings extending through the intermediate collar.

Cam-shaped slots are cut in the in-

termediate collar, and in them run tapered rollers, one set of which is anchored to the inner collar, the other to the outer collar. Therefore, when the intermediate collar is rotated, the lens in the inner collar is moved straight forward or back, without rotation. The rollers are pressed into their respective slots by spring pressure, automatically compensating for wear. The cams are cut so that regardless of the focal length of the lens in question, rotating the intermediate collar to any given degree will bring any lens to a focus at the same point. This obviously permits the use of a single, remotely located focusing control and scale for all lenses. A simple mechanical linkage interconnects the lens-mount, focusing control and finder. No supplementary cams are necessary between the focusing mechanism and finder, and there are no accessories to be changed when lenses are switched.

Regarding the development of the camera, Laube says, "In creating this camera, we have tried not only to produce a successfully noiseless camera, but to produce a more perfect photographic instrument as well. One which will meet today's known problems fully, and which will be prepared to cope with every one of tomorrow's needs insofar

as we can foresee them. In the history of cine camera-design, there are certain designs which stand out like beacons, plainly marking the course of cinematographic progress. Following Eastman's invention of celluloid film, and Edison's invention of the Kinetoscope, there ensued a period of rather aimless pioneering: almost any camera that would make a moving picture was accepted, regardless of how carelessly it was designed, or how crudely it worked. About 1910, Bell & Howell introduced scientifically standardized design, and a new note in precision engineering. Roughly a decade later, the Leonard-Mitchell design answered the call of the times with a new, faster-working camera. It is significant that both of these designs have endured, with only minor modifications, until today. Though their designs were laid down ten and twenty-five years ago, these cameras are still photographing our pictures today. They are at once a challenge and an inspiration to any man who undertakes the design of a professional camera today.

"In planning the Twentieth Century Camera, we have striven to strike an equally foresighted note. A silent camera is in itself a worth-while development: but if it can offer no real advancement beyond the mere absence of noise, it cannot be considered a really enduring achievement. Eliminating noise will automatically free Cinematography from the physical shackles imposed by quarter-ton camera-blimps, and speed up production, taking care of today's immediate needs, but leaving unanswered the needs of the future. Putting it another way, we are getting along adequately enough with our present repeatedly rebuilt cameras and blimps; each new blimp-design, too, tends toward easier operation and lighter weight. Eliminating the need for blimps would unquestionably facilitate production to the extent of permitting economies which would quickly offset the initial investment in new equipment: but if the cameras, as photographic instruments, did not yield better photography, and make provision for meeting such future needs as we can foresee, we would not be essentially any better off than if we continued using present-day equipment.

"We have tried to fulfill both of these requirements in the Twentieth Century Camera. Silent operation, we have definitely secured. The camera does not need any soundproof covering at any time. This, together with the general layout of the apparatus, makes for faster—and therefore more economical—operation. Instead of a crew of four men needed to move a 400 pound blimped outfit, a single man can shoulder this 82-pound camera and move it as easily as only pre-talkie equipment.

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Destroying Pompeii---in Miniature

Continued from Page 519

Attention . . . Foreign Producers!

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ing of all these various elements. Obviously, the shot had to be lined up very carefully, and many tests made to make sure that the smoke didn't roll from the wrong place, or that some other misalignment didn't occur.

Finally, in several of the shots, people were added in the foreground by the travelling-matte process—and the shot was complete, having passed through half-a-dozen or more different cameras.

One of the finest examples of the miniature-builder's art was the "Temple

of Jupiter," constructed under the supervision of Willis O'Brien by Gus White and his assistants. In the background, behind the temple (which was an exact reproduction of the original, according to the most authoritative reconstructions), was Vesuvius, belching forth its fire, lava and ashes. Overhead, the clouds of ominously-looking smoke throughout the city, the burning and smoking buildings. And finally the crash and destruction of the temple.

This was one of those nerve-racking shots, for it had to be made—and made right—at one take. The slightest slip on the part of any one of the twenty men who worked this set would mean weeks of hard work rebuilding and re-shooting the scene—not to mention thousands of dollars extra expense to the studio.

We made test shots of all the effects except the actual crash of the temple—the most important effect, and the only one we couldn't test. Thanks to the efficiency of Harry Redmond's crew of "effecters," only minor changes were needed. A little less smoke here, a little more flame there, and so on. Then the four cameras were again tested for steadiness, for here, too, steadiness was a prime requisite, as chariots, horses, and people (real ones!) had to be processed in later—and even an earthquake couldn't explain a background that jiggled while the foreground didn't.

The tests are projected, and the final minute changes are made.

"Zero hour" is at hand.

The order, "Hit 'em!" is given. The lights blaze on. Flares and fire-pots are lighted. Hundreds of smoke-pots are fired electrically. Everything is ready.

"Camera!"

"Let 'er go!" The rocking motion of the earthquake starts—the wires start the building to crumbling, and "go" she does.

"A-a-ah!" All hands sigh with relief. Perfect the first time!

Did it look real? There were some who saw the "rushes" who wouldn't believe it was done in miniature!

The scene in the arena, in which the Colossus crumbles and falls after the start of the earthquake was another thrillingly difficult scene. It was not "done with mirrors," as some reviewers have expertly stated, but was a combination of a full-sized arena set, with real people and horsemen, a miniature arena, glass painting, miniature projection, and a life-size breakaway Colossus which was photographed at high

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speed. The task of merely combining these shots into a homogeneous composite is an intricate problem of special-effects trickery in itself.

How were all of these earthquake and eruption effects made so lifelike? Well, here in California we have a certain amount of first-hand information about earthquakes, even if we are a bit shy on volcano lore. The volcano part, however, we perfected through careful study of scientific descriptions of actual eruptions, and analysis of films of volcanic outbursts, including "Kakatoa," and newsreel scenes of actual eruptions of Vesuvius. However, we had to take dramatic license in many respects, for a real eruption is such a grimly slow-moving thing that it lacks the thrilling "punch" demanded on the screen!

Making these scenes is almost as gruelling as living through a real eruption—though for an entirely different reason. With so many tiny details which may go wrong and spoil a scene which cannot be re-taken, the nervous tension is terrific. After living through "The Last Days of Pompeii," following "Kong" and "Son of Kong," I can heartily sympathize with the special-effects "ace" who, after successfully filming a miniature in which a \$50,000 scene was made in 20 seconds, had a nervous breakdown and spent a month in a sanatorium!

familiar 16mm. for silent films, and the R.C.A. 16mm., with one row of perforations eliminated and the edge of the film utilized for the sound-track, for sound-on-film. Two standards are known in the 8mm. field: Eastman's original type, in which specially perforated 16mm. film is split lengthwise after processing, resulting in a projection-standard of 8mm., single perforation film; and the newly-introduced Bell & Howell pre-split 8mm. film, in which both camera and projector use single-perforation stock 8mm. wide.

Abroad, in addition to these standards, several others are found in the substandard field. Among these are the Pathe Rural 17.5mm. non-theatrical standard, upon which a sound-track is sometimes added by suppressing one row of perforations; a 16mm. sound-film in which both perforations remain, and sound-track and picture are in the same relation as in standard 35mm. film; and Pathex 9.5mm. amateur film, which is center-perforated.

Sponsored by the Academy of Motion Picture Arts and Sciences, a movement is under way to standardize release-prints on 2,000 ft. reels. Despite the

cost of the new equipment involved in theatres and exchanges, important economies are anticipated, and several of the major distributing-firms have agreed to make such a change for domestic releases after the first of the year.

Sound

A general improvement in sound-quality has been noticeable.

Both Western Electric and RCA have developed so-called "push-pull" recording and reproducing methods productive of more natural quality, lessened ground-noise, and a much greater volume-range. The system used in conjunction with Western Electric recording was developed by Douglas Shearer, A.S.C. and his associates at the M-G-M studio, where it is in use.

In consequence of these high-quality recording methods, it is understood that several major studios are supplying two types of release-prints: one carrying the "push-pull" sound-track, for theatres equipped with reproducers and amplifiers capable of reproducing from such

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★ Taylor-Hobson Cooke F 2 Speed-Panchros are universally preferred for black-and-white and for color work, because they are the most perfectly color-corrected lenses ever formulated, giving not only maximum color correction for today's production conditions, but also exceptional correction for all other aberrations. Eleven focal lengths, 24 to 108 mm.

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a track, and a re-recorded version for theatres with older equipment.

An interesting development was the Miller-Phillips Mechanographic recording system. This uses a stylus to cut a mechanical record in an opaque coating on the film, which record can then be either re-recorded mechanographically or printed photographically for releases. Greater resolving power and consequent improved quality are claimed.

The Berndt-Maurer Corporation introduced a new type of oscillograph (galvanometer) recorder which may be substituted for a glow-lamp, and produces a Variable Area track.

Considerable use was made of Vertical Cut ("hill-and-dale") disc recording for recording musical selections, and some studios used acetate discs similar to home-recording phonograph records for immediate playbacks.

The renewed interest in color cinematography brought the problem of high-quality film records on color prints to the fore.

lamps was evident. 16mm. projectors of 1,000 watts were introduced, and 8mm. projectors of 300 and 400 watts placed on the market.

With the increased use of 8mm. cameras, a new interest in projectors capable of interchangeably projecting 8mm. and 16mm. film became evident in many quarters.

Laboratory Methods

The commercial application of the involved processing required for Kodachrome 16mm. color-film, which is stated to involve more than 35 separate operations, was undoubtedly one of the greatest achievements in the laboratory field.

Competition from studio laboratories appears to be forcing the modernization of commercial plants.

The Eastman Kodak Co. introduced the "Argentometer," a device for determining the silver content of hypo solutions. A buffered sodium sulfide solution is added to a standard quantity of the solution to be tested, which is then placed in the argentometer, in which the altered transmission of the solution alters the reading given by a microammeter connected to a photronic cell.

Several laboratories have been experimenting with photocell-densitometers. In some instances, such devices are understood to be used commercially controlling the processing of sound-track.

Art Direction

"Becky Sharp" proved that much of the success or failure of natural-color films will depend upon intelligent art-direction, and it is generally conceded that the future of color rests on the shoulders of the Art Directors and the Cinematographers.

Problems of Control

Continued from Page 514

the consistency of contrast.

The problem faced in photographic reproduction can be condensed to that of creating a visual sensation in the finished print identical to that conceived by the eye when observing the original object. This sensation is governed principally by the amount of brightness as a whole and by the brightness differences which are identical with contrasts. While it is relatively simple to control photographic results by exposure and processing sufficiently to satisfy the request for identical brightness to the eye in the finished print as



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Stendord Sound

16mm. sound-on-film appeared at last to be wresting substandard supremacy from the more unwieldy sound-on-disc. A number of new 16mm. sound-on-film projectors—all using the RCA single-perforation standard—were introduced. Among them are such familiar names as Bell & Howell, Ampro, Victor, DeVry, and the like.

Bell & Howell announced the formation of a 16mm. sound-film library, while trade papers carried reports that British and other producers were reducing their 35mm. theatrical releases to 16mm. very quickly after general release of the 35mm. version. A noted Hollywood Producer, Edwin Carewe, formed a company to produce religious features for 16mm. non-theatrical release.

Bell & Howell perfected an excellent reduction printer for optically reducing sound-tracks to 16mm., and DeBrie, of Paris, entered the American field with reduction printers, developing machines, and other substandard apparatus.

Projection

Professional projection problems seemed heightened by the increase in density, and the consequent need for more intense light, resulting from natural-color films. Partly to meet this need, the National Carbon Company has developed several new types of projection carbons, and lamp manufacturers, optical firms, and the like have contributed advances in projection-lamps, condensers and lenses.

In the substandard field, a general increase in the power of projection-

in the natural object, the problem of matching brightness differences or contrast in the final photographic reproduction to that conceived by the eye from the natural object is of an extremely complicated nature.

The solution lies in the fulfillment of the above given equation which calls for an overall gradient equal to unity.

In analyzing this equation and applying it to existing practical conditions the following statements must be thoroughly understood. In every laboratory the positive gamma is a constant factor for the reason that faithful sound reproduction depends upon fulfillment of the same law controlling overall gamma. Thus the product of the negative gradient multiplied by the positive gradient and also the positive gradient itself are constant, that is, they are fixed values not eligible to any alteration of great proportion.

This fact places an enormous responsibility on both the cameramen and the negative developer as the negative gradient must be of a definite uniformity, the maintenance of which is a difficult task due to the many variables introduced by the present methods of photographically recording a motion picture.

The next article offers an analysis of these difficulties which comprise the principal practical problems of the cameraman.

Complete Laboratory in One Unit

Continued from Page 518

"The operator has accurate gauging of his developing time by a mechanical and manual control.

"The chemical solutions as for temperature and mechanically controlled refrigeration and thermostatic.

"Agitation of the developing solutions is done by a circulating pump.

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"The phenomenal part of this machine is that it requires little space. The entire set-up can be installed in a room twelve feet long and six feet wide.

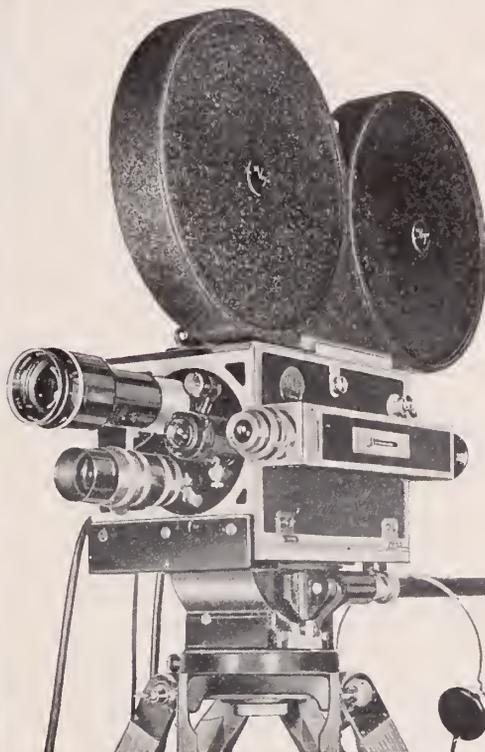
"The dimensions of the Junior model are:

"Ten feet, six inches long, by five feet, nine inches high, by three feet wide.

"Shipping weight will not exceed one

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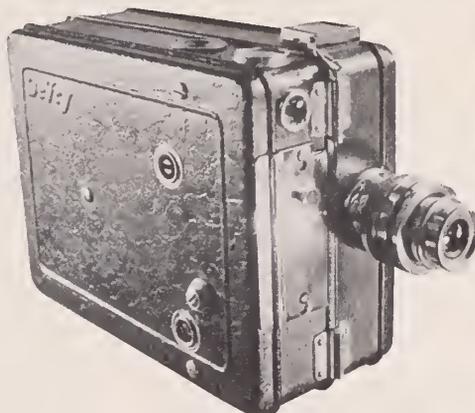
Professional Results with Light, Easy Handling

Hermon A. DeVry's well known genius for simplification was never better illustrated than in this great piece of cinematographic engineering. There is no room here to go into details. These will be furnished on request. Suffice it to say that here is a studio sound and picture recorder, incorporating such masterful engineering that it is faster in setting up and operation, for studio or news reel work than any camera made.

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"The machines will be distributed through the Premier Motion Picture Equipment Company, located at the factory of the Gwynne, "One Man Laboratory," Developing Machine Company, 8226 Santa Monica Boulevard, Hollywood.

An Etcher of Character

Continued from Page 515

seeking to clutch at men who dare fly and to claim them for its own. Every scene shows this atmospheric villain.

Interior scenes, of which there are many, depict a normally aired room but with the clinging fog constantly menacing just outside wide windows. Here again, lighting requirements were far from elemental. These scenes had to be lighted twice; once for the clear interiors and again for the murky exterior.

Handling of the fog itself presented intricate mechanical difficulties, mainly in keeping the fog out of the interior sets and outside, where it belonged properly.

A series of fans handled the outside fog satisfactorily, but the thin vapor insisted in penetrating the interior set. Then was evolved an ingenious series of air-pumps leading into the inside set, setting up just sufficient air circulation to keep the fog outside but not interrupting its normal action in the open air.

To complicate further the conditions, beams from a revolving beacon penetrated at regular intervals foggy exterior and lighted interiors.

Edison combines within his stacky, pleasant person a remarkably exhaustive knowledge of cinematographic machineries with his talent of pictorial dramatic revelation. At his home, his private laboratory gives him opportunity for extensive experimentation. There is little in the great field of photography and its allied subjects that he is not, from first-hand handling, surprisingly familiar with.

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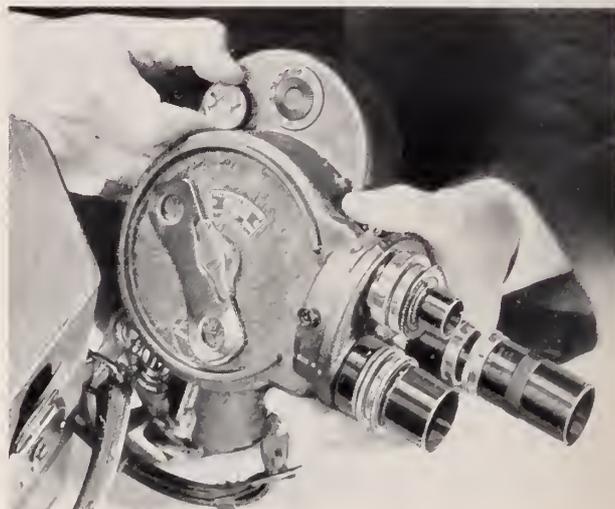
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FILMO 70-E

The 70-E is similar to the 70-D, lacking only its turret head and the variable area feature of the spyglass viewfinder. Operates at 8, 16, 24, and 64 frames per second. Like the 70-D it has 100-foot 16 mm. film capacity and may be fitted with the same accessories. Filmo 70-E, with F 2.7 lens, \$133. Case, \$17.

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AMATEUR MOVIES

25c

DECEMBER
1935

this issue

Filming Snow with Filters
Interiors Without Lights
Christmas Continuity
Elements of Composition
... and other features





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YOUR Christmas sequence may call for a wide variety of shots—from Father trimming the Christmas tree to the children hanging up their stockings in the firelight.

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AMATEUR MOVIE SECTION

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Next Month . . .

- There will be more about interior lighting. Commonsense advice with simple equipment on how to get the most out of what you have on your interior shots.
- Another interesting gadget will be presented . . . something you can make yourself.
- A timely continuity, and of course other good suggestions.
- But the biggest news will be the announcement of the 1935 Amateur Movie Prize winners.

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society at Cinematographers for the Amateur.



Photo by Karl A. Barleben, Jr.

Filming Snow Scenes With Filters

ONE of the wonder-spectacles of winter is a snow storm and its results. Filmmakers in sections where snow is not an uncommon event have at their disposal some of the finest picture material imaginable, for while snow is white, and therefore possibly drab and uninteresting to some workers, it holds certain beauties which never fail to go over big on the home movie screen—if the filming is done correctly. Make no mistake—shootings snow is not as easy as it looks, for if the delicate textures of snow are to be preserved, you must do more than merely press the button of the camera. In an effort to outline briefly a few of the essentials in snow photography, it might be well to dwell a few moments on the fundamentals of this fascinating work.

The professional movies frequently contain snow scenes which are photographic gems—crystal clear and bright, alive with sparkling sunlight, rich in shadow and snow detail and texture. Many the amateur filmer has seen such scenes and attempted to duplicate them, only to become sadly disappointed with his efforts along these lines. Why? Principally because a few elements of snow photography were overlooked or ignored.

In order to fully understand snow photography, it is necessary to understand snow. One of the most important things to remember is that while snow appears white to the eye, in truth it reflects various colors which are nearby. This is easy to understand, but there is another tricky phase: the shadows in snow. Tracks, foot-prints, ruffles, and all other manner of indentations in snow naturally cast shadows which, to us, appear as dark or black. Actually these shadows are **blue**—notice this for yourself the

next time snow is on the ground, for the truth of this statement. The shadows being blue, then, do not readily manifest themselves on the film, blue photographing as white, resulting in snow which lacks texture and detail—we are all familiar with the white-wash effect in which only a plain expanse of white is to be seen. It looks as much like snow as a bucket of milk! Such results are indeed discouraging, yet can be readily remedied by the use of a filter.

Just which filter to use to bring out the shadows and details depends upon several factors, chief of which is the amount of correction desired. With a panchromatic film, a pale yellow filter such as the Wratten K-1, will produce a normal reproduction of snow on the film as the eye sees it—the blue shadows will be shown as dark in the picture, and the texture of the snow brought out quite clearly and satisfactorily. A heavier filter, such as the Wratten G will produce over-correction to some extent, while a Wratten 23-A or A will result in decided over-correction. These filters may be properly classed, for this purpose, as effect filters, although there will arise circumstances where they are the means of producing very

Continued on Page 549

by
Karl A. Barleben, Jr.

Interiors Without Lights

by
William Stull, A.S.C.

AS I WRITE this, a strong beam of sunlight comes through a window by my desk, lighting me warmly. Now, if I was outside the window, in the same sunlight, no one would deny that a member of the sixteen-or-eight brigade could photograph me — granting, of course, that he cared to waste film on so unprepossessing a subject. Why not inside the window, as well? The sunlight seems almost as strong and warm: what's to prevent using it for photography?

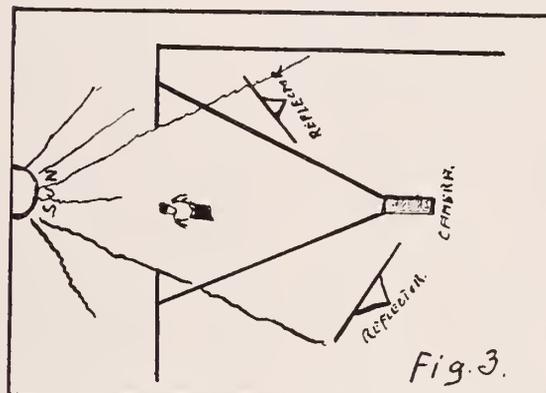
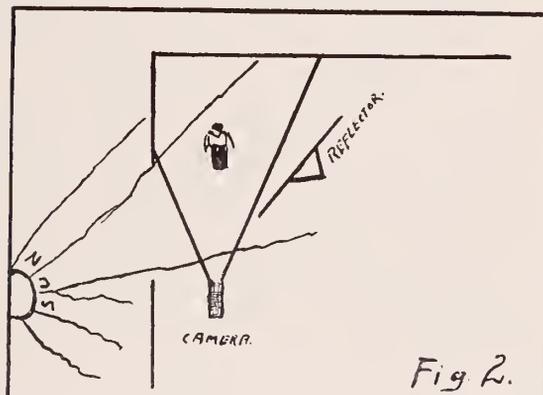
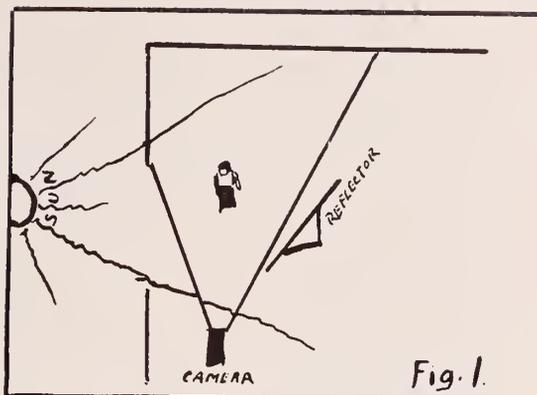
Putting the question up to my Weston meter, I find that outside the window, the correct exposure with Super-Pan would be about $f:16$ —and that inside, the sunlit areas would be correctly exposed at $f:8$. Obviously then, a passing cinefilmer could get a very nice shot of me here, without using any lights.

But it would be distinctly a one-sided lighting: the side of my face toward the window would be strongly lit, while the side away from the window would be heavily shaded.

Outdoors, the answer to such a lighting problem would be to use a reflector on the shadow-side, to throw some of the sunlight back into the dark side of the subject. Well, the same thing would work quite as well indoors as out. Placing the reflector in the proper place we could throw back enough light to brighten up those heavy shadows without flattening the picture by wiping them out completely.

And there, in a nutshell, is the secret of making interior scenes without lights: use the light from a window for the highlight side of your shot, build up the illumination in the shadows with reflectors—and there you are! It's as simple as that.

The simplest sort of lighting, of course, is the cross-light just described, and sketched in Fig. 1. Next to that (and usually more pleasing) is a straight or three-quarter front-light, as seen in Fig. 2. In this case, the window through which the light comes should be rather wide, to simplify placing the reflector. Naturally, with this sort of lighting, the direct sunlight will fall on more of the background area, giving you more depth in your shot. Where the sun does not strike, your picture will be either a jet-black shadow, or badly underexposed, unless you have additional reflectors to throw light on the background as well as on the subject.



Sometimes, too, you can make very effective back-lit effects this way, placing subject and camera as shown in Fig. 3. Two reflectors will be necessary, one on each side of the camera, with one nearer the subject than the other, so that we still have a highlight side and a shadow side. For the best results, the sunlight should come from a rather high angle, and it is well if some shrubbery or the like is outside the window, blocking off the lower half through which we would otherwise shoot—and thereby eliminating the uneven exposure between the foreground and that part of the background seen through the window.

These effects, though, are among the more elementary ones we can get indoors. If we have really fast lenses—say, $f:2.5$ or faster—we can get away from the direct sunlight and its harsh lightings. There is really a surprising amount of light to be found by windows through which the direct rays do not come—and it is a softer, diffused light which gives infinitely more satisfying photographic rendi-

Continued on Page 542



Continuity for a Christmas Comedy

by
J. Dickinson Reed

MAIN TITLE: DEAR SANTA.
Scene 1. LONG-SHOT of a group of boys playing in the snow.

Scene 2. MEDIUM-SHOT of same. One of the boys, "Buddy," is seen to stop, pull out his watch, and start to leave. The others cluster round him, urging him to stay a little longer.

Scene 3. CLOSE-UP of "Buddy." He indicates plainly that he has to go, and moves forward into the camera.
FADE OUT.

Scene 4. FADE IN. Long-shot inside of house, in front hallway. Buddy comes in, hangs up his coat and cap, and hurries up the stairs.

Scene 5. CLOSE-UP of bathtub faucet as water is turned on.

Scene 6. CLOSE SHOT of floor in corner of bedroom.

Buddy's garments are thrown into the scene, one after the other.

Scene 7. CLOSE-UP of Buddy's bare feet hurrying down hall.

Scene 8. CLOSE-UP of feet entering bathroom.

Scene 9. Medium CLOSE-UP of Buddy in bathtub, very energetically soaping himself.

Scene 10. CLOSE-UP of Buddy in tub, actually washing behind his ears.

Scene 11. LONG-SHOT of Buddy, enveloped in a big bath-towel, drying himself.

Scene 12. MEDIUM-SHOT of Buddy, in his BVD's, getting out a clean shirt.

Scene 13. CLOSE SHOT of Buddy, fully dressed in clean clothes, in front of the mirror, combing his hair. He is taking great pains with it—when he finishes, he surveys himself critically, picks up the comb again and smooths out one slightly out-of-place lock, sets the comb down, and turns as if to go.

Scene 14. LONG-SHOT in the dining-room. The table is set for lunch. Mother comes in with the last dish, and goes to the door, as though to call Buddy.

Scene 15. Medium LONG-SHOT toward door. Mother enters the picture, and just as she reaches for the doorknob, the door swings open, revealing Buddy, washed and combed and dressed in his best. Both stop.

Scene 16. CLOSE-UP of Mother. She is speechless with surprise.

Scene 17. LONG-SHOT toward door, with table in foreground. Buddy marches past Mother, and takes his place at the table. She follows him, and starts to serve lunch.

Scene 18. CLOSE-UP of Buddy, eating. Shoot this at 8 frame-speed to show him eating at racing speed. LAP-DISSOLVE (or fade out and in) TO

Scene 19. CLOSE MEDIUM-SHOT of Buddy (normal speed). He has finished eating. He pushes away his empty plate, folds his napkin, and leaves the table.

Scene 20. LONG-SHOT in dining-room. Buddy comes in, wearing his overcoat and rubbers, and carrying his cap. He kisses Mother good-bye, and leaves.

Scene 21. LONG-SHOT of Buddy walking briskly down the street.

Scene 22. LONG-SHOT at corner. Buddy gets into a street-car.

Scene 23. CLOSE-UP of Buddy in street-car, made from within the car. He sits expectantly, glancing out of the window now and then.

Scene 24. LONG-SHOT at down-town street corner. A street-car stops, and Buddy gets out.

Scene 25. LONG-SHOT on down-town street. Buddy is seen walking hurriedly along, weaving around the slower-moving shoppers.

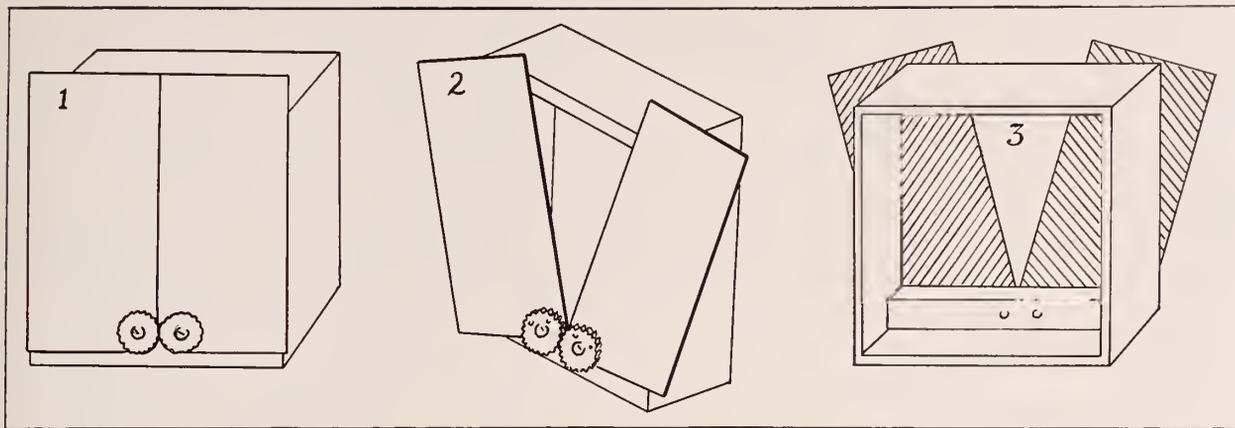
Scene 26. LONG-SHOT of entrance to big office-building. Buddy enters the scene and goes into the building. LAP-DISSOLVE (or fade out and in) TO

Scene 27. Same as Scene 26. Buddy and Father come out of the building together, and walk off.

Scene 28. Medium LONG-SHOT of crowd gathered before a store-window.

Scene 29. Series of CLOSE-UPS of children with their noses pressed close against the glass.

Continued on Page 549



Building a Home Made Wipe-off

THIS simply built combination sun-shade and wipe is made of material easily shaped and cut and available to anyone.

Tin is used for the foundation; the finish is black cardboard glued to each side the tin after it has been cut into the desired sizes and shapes.

The wipe wings are made to operate smoothly as shown in Fig. 2 by operating them in unison by means of the small gears shown at the center bottom of the box and at the inside lower corners of the wipe blades.

Usually illustrations can tell more quickly and plainly how a thing operates and is built. Therefore if you will refer to Fig. 1 you will see the box as it looks from a front view with the wipe blades closed. The next figure shows the blades slightly open giving a fan effect to the picture. The next figure which is Fig. 3 is a rear view of

by
Arthur Wolff

the effect box. On this sketch you will see a small block of wood at the bottom used to fasten the center gears.

Fig. 5 is the assembly less the wipe wings. Fig. 5 together with Fig. 6 gives you the complete assembly. Fig. 6 is merely a ruler bought in the 5-and-10-cent store. The hole drilled in the right side is for placing over the screw in the tripod so as to fasten this ruler between your camera and the tripod head. The other end of the ruler goes through the slot at the bottom of Fig. 5. The entire outfit assembled is shown in Fig. 7.

Fig. 4 is the complete sunshade and effect box. This fits in the upper opening of Fig. 5 which is a frame work made to hold this and the ruler.

Fig. 5 calls for a more rigid material as this portion of the assembly must carry whatever weight the device might have. I made Fig. 5 out of wood.

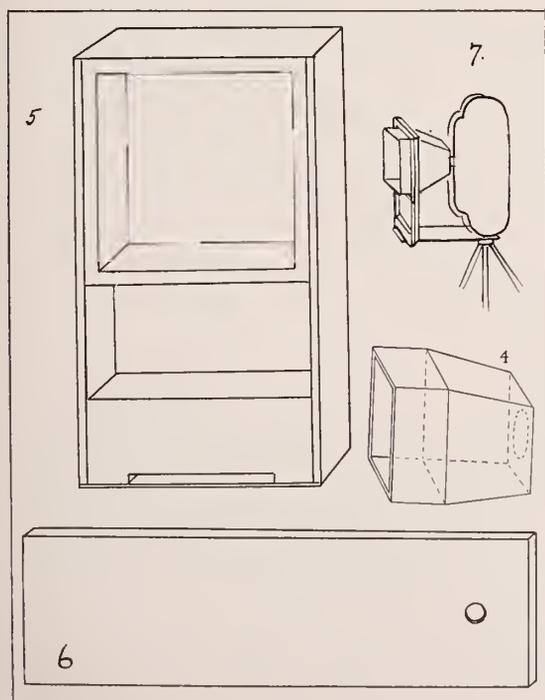
While this is built merely for a fan wipe, the imaginative constructor will possibly find many other ways of applying wipe blades. The material used is so cheap and plentiful that if a device of this sort is used only a few times it pays for itself.

Most of the gadgets I build for my camera are made from tin. This works very easily and as a general rule the tools I require are merely a knife and scissors.

After my patterns are cut I put them in their paper place and hold them together with black gummed paper tape (the same as is used for lantern slides).

I have not given measurements as they will be governed by the type of camera you are using. However, as a guide I might mention that the outside dimensions of the box as shown in Figs. 1, 2 and 3 are 3"x3"x1 1/4". The measurements of Fig. 4 are 3" high at front, 3 1/4" from front to rear, and the rear is 2" square. The hole, of course, is governed by lens size. The height of Fig. 5 is 5 7/8", the width 3 3/8".

Those who like to make their own gadgets will find this simple to construct.





Definitions of Elements in Composition

LINE: Design begins with line. Connected and inter-laced lines create areas. In architectural and costume design, lines denote qualities that are important; i.e.

- VERTICAL
- HORIZONTAL
- OBLIQUE
- SPIRAL or CURVED LINE
- BROKEN

Structural lines are found in the fireplace, furniture, in the doorway and windows; in the silhouette of a costume.

A line may be narrow or wide. The wider it is, the more it is like an area. A line or lines within the outline add interest and complexity to a subject, such as architectural relief, embroidery pattern, wall panels, etc.

It will be found that a tone of dark is formed by the association of two or more lines, this tone may be darkened by increasing the width of the lines, or by bringing them closer together.

PRINCIPLES: Variety and interest is well selected lines used together. Measured, size and number of lines of different types determine the final result.

Variety in grouping of lines eliminates monotony. The wider the line, the greater will be its accenting value.

Design must have a main axis. This starts the eye moving, other lines in the design must be subordinated to the main line. Subordination is brought about by the selection in size, length and width. The position and direction of a line is important in relation to other lines.

In a group of lines, one line or pair of lines must predominate in size and position. If a line, space or color asserts itself to the detriment of

by

J. Belmar Hall,

Instructor, Department of Cinema, U.S.C.

others the result will be discord, not harmony. The main or structural lines of an object or design determine the location of the center interest. Structural lines should determine the character and general direction of the other lines. In speaking of "good design," we mean that the line qualities and line divisions are structurally good and artistically handled.

Next month we will take up the other principles in structural design in composition. Dynamic symmetry also will be covered as this is one of the most important things in good composition.

THE AUTHOR'S GHOST

SYNOPSIS: A study in lines, angles and tricks of the 16mm camera built around a dummy figure of an author who has only saw-dust for brains. In his mad search for ideas, such that could come only from a brain of this kind, we are led a merry chase into all the abstract forms that will make a perfect montage or mounting of shots that are related to the story through the movement they express. Each shot must build up the tempo until the brain-pictures that flash through the dummy head of the author cannot stand the strain any longer as ideas meet and clash

Continued on Page 550



Making Fades on Positive

FILM editing, that phase of motion picture production during which the many scenes of a picture are assembled and united into a smoothly flowing story, is a very important job in the preparation of a successful picture. In this work, the film editor calls to his assistance many mechanical devices to produce the proper continuity and tempo, one of the simplest of these being the fade.

The first all metal cameras manufactured about 1912 by the Bell and Howell Company incorporated in their construction a variable gear-driven shutter mechanism by which the operator was able to continuously and evenly decrease his exposure from normal to zero over a film length of eleven feet. These cameras, which were used by Essanay, were improved shortly after to produce an eight-foot fade and finally to make a four-foot one, the length which is produced by the present camera.

When such a negative was printed, the general density of the print increased to such a point that the screen gradually became completely dark, hence the name "fade-out" which was adopted for this effect. By reversing the procedure on the beginning of a scene a "fade-in" is produced.

With the gradual development of motion picture technique, and particularly with the advent of motor-driven cameras which accompanied the introduction of the sound picture, the practice of making fades in the camera on the original negative was discontinued. A fade in a release print is now produced either by chemically bleaching the negative or by making a duplicate in an optical printer, in which case the variable shutter is again brought into play.

In the initial assembly of the picture by the film editor it is sometimes desired to see the effect of inserting a fade at some point. In this case the print is dyed. By so doing, no alteration is necessary in the original negative until such time as a definite decision is made that the fade gives the desired effect.

Such a fade made on a print with dye should be quite neutral in color, should take into the emulsion without difficulty and be quite opaque at the end. Many dyes have been tried for this purpose but up to the present time no single dye has been found with these properties. Recently a material was introduced for this known as Foto Fade which consists of a mixture of dyes and chemicals balanced to give the desired effects. Extensive tests by a number of the laboratories in Hollywood have shown that Foto Fade produces a uniform neutral fade quite simply by a mechanical dipping process.

In the majority of productions by the amateur reversal film is used so that the editing is done on a positive. Since few amateur cameras are equipped with a variable shutter mechanism, the availability of an easy and rapid method of making fades brings to hand an additional and useful tool.

A pint of water in which five grams of Foto Fade have been thoroughly dissolved is placed in a deep narrow vessel such as a cylindrical graduate. The film to be dyed is

by

Thomas R. Barrabee

Chemist, Dye Research Laboratories

immersed frame by frame, the lower end being weighted with a clip. The film is withdrawn in a similar manner, squeezed between damp cotton, rinsed and dried. An immersion of about one minute is necessary to render the film entirely opaque. The solution of Foto Fade keeps indefinitely and hundreds of fades can be made from a single pint of solution. Since the dye sets into the emulsion, it is not affected by projection and the result is quite permanent.

The skillful and judicious use of fades following main titles, to indicate lapses in time, changes in location, etc., adds much to the "production value" of a motion picture.

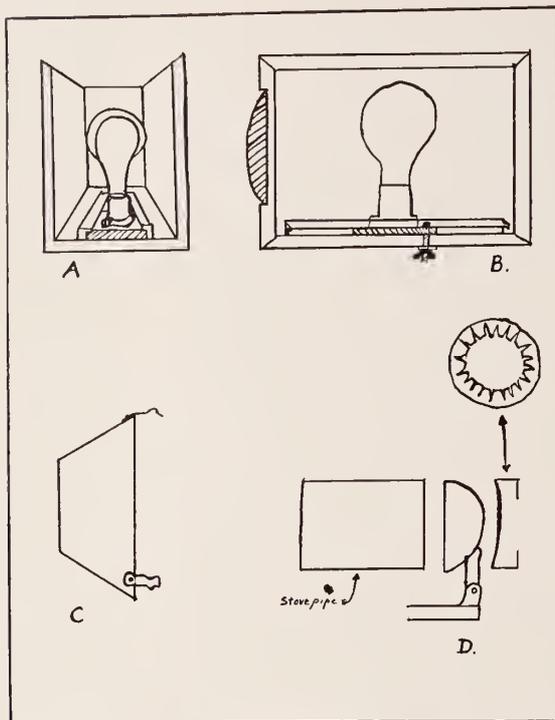
It is claimed that several of the Hollywood laboratories devoted to 35mm film have adopted this new chemical for the making of after fades. It will possibly find favor with amateurs who are not always certain that they want to make fades when they are shooting their picture, but are desirous of inserting them after the picture is made. This is the method used today by the professional laboratories in Hollywood. The fades, while not made chemically are made in the printer which of course is possible with negative and positive. The first prints turned out for the cutter do not have these effects, they are determined after the picture is cut.

It is well to always stir a chemical such as this fade before using, it is only natural that some of the heavier elements will be inclined to drop to the bottom of the container and, of course, your film would not receive the full effect of the dipping.

You can tell when your chemical is not properly mixed. Your print will show a strong reddish cast.

It is well not to make fades too long. Remember you must make a fade in and a fade out to make the scene smooth, so a foot fade out and a foot fade in in most instances plenty. This means five seconds on the screen before the complete fade in and fade out is completed.





A and B, end and sectional views of partly-finished wooden spotlight. C, snout; D, concentrator for desk-lamp.

Making Your Own Spotlight

by
J. Hommel

HOME-MOVIE interior scenes frequently call for spotlight effects. The equipment people have been very nice indeed about making inexpensive general lighting units for home filming, but so far they've been less considerate in the matter of turning out spotlights. Only one home-movie spotlight has appeared on the market so far: and aside from this, the cinefilmer's only alternative is to buy a professional "bobby spot," and these—unless one is lucky enough to pick up a used one at a theatre-supply shop—come rather higher than the average amateur cares to pay.

But it is quite possible to build your own spotlight, or even to improvise crude makeshifts that will to a certain extent, give spotlight effects.

The simplest sort of makeshift is made by putting a Photoflood into an ordinary reading-lamp, and fitting a tubular hood over the lamp's reflector. If the tube is long enough, it will cut off the spreading rays at the edge of the beam, and give a round spot of light which is good enough for some purposes. The simplest thing to use for this tube is a length of ordinary stove-pipe. Take a short strip of pipe, slit one end of it with shears, and fold them down so that they fit over the lamp's reflector. Then slip a longer piece of the stove-pipe over this—and there you are! If you want to be really ritzy, you can fit a third section of pipe (just a shade larger) over the tube, so that by moving it in or out you can to some extent control the size of the spot.

Another gadget is the "snout" or concentrator, which has several times been described in this magazine. It is used over any ordinary photographic light, and gives fair spot effects. Go to any shop where they make sheet-metal spinings, and have a cone made; the big end should be approximately the same diameter as the front of the reflector of your regular lamp. The small end should be about six inches across. Then rivet three little spring clips at intervals around the big end, and you'll have a "snout" that fits your floodlight.

These makeshifts will work well enough, but they waste a lot of light. You see, in a real spotlight, to make the beam smaller, you move your globe closer to the focus of the lens, rather than simply cutting off the edge of the beam: so you get a stronger, concentrated light as you pull the beam down. With either the snout or the stove-pipe gadget, you simply cut off the edge of the beam and, so to speak, throw the light away. Whether you cost a big spot, or a tiny one, the intensity of light is the same. Pointing a photacell meter at such a lamp, your reading would be the same whether you had a large spot or a small one; but with a true spotlight, you'd get a low reading—say around 200—when the beam was flooded out, and kick the needle clear off the dial when the beam was spotted down.

It is fairly easy to build a real spotlight, too. The heart of the lamp is a plano-convex condensing lens, which can be bought at any photo-supply store for a few dollars. The larger the diameter of the lens, the more light you'll collect from your light-globe, incidentally; but its focal length will probably be longer, too, so your lamp will have to be bigger.

If you are a fair carpenter, wooden construction will do. Build your box out of three-fourth inch plywood, and make it large enough to allow reasonably ample air-space around the globe, and long enough so that the globe will be in focus at the rear end of its travel. The globe itself can be mounted in an ordinary ten-cent-store socket (porcelain will probably stand the heat better than Bakelite). This socket should be screwed to a square block of wood thick enough so that the center of the lamp-globe will be even with the center of the lens. The block should project a little on each side of the socket-base. Two strips of L-shaped molding are mounted upside-down along the bottom of the box, and serve as guides for the lamp; the projecting edges of the base-block fit under these rails.

There are two ways of controlling the focus of the lamp. The simplest is to cut a small slit in the bottom, between the rails and running the length of the lamp; a bolt passes through this from a hole in the wooden lamp-

Continued on Page 544



Christmas for keeps
when you give Cine-Kodak

NO one knows better than you how thrilling home movies really are. So what better present could you make to those you want to please the most than Cine-Kodak Eight?

Think of the fun they'll have in seeing their own movies clear and brilliant on the screen. Christmas for keeps—that's what they get when some one gives Cine-Kodak Eight. Christmas and a thousand-and-one other lovely, memorable days they'll want to save.

It's a movie camera of remarkable economy, giving four times as many

movies per foot of film. A roll of "Eight" film runs as long on the screen as 100 feet of any amateur standard home movie film. 20 to 30 movie scenes—each as long as the average scene in the news reels—on a roll of film costing \$2.25, *finished, ready to show*. This means movies at ten cents a shot. The "Eight" costs only \$34.50. See it, and samples of the movies it makes, at your dealer's.

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Eight



...ready for the holidays in its own Christmas wrapping.

GIVE A KODAK



WHEELS OF INDUSTRY

Reflex Box Camera

● Burleigh Brooks announces the K. W. Reflex Box Camera which takes $2\frac{1}{4}$ by $3\frac{1}{4}$ inch roll film and has self-erecting hood of the usual reflex type, containing focusing screen or ground glass, which shows an image of the subject in exact size and in sharp focus.

The all-metal slit shutter is adjustable for speeds of $1/25$, $1/50$ and $1/100$ second and for brief and long time exposures. The scales for stops, distances and shutter speeds, are conveniently arranged to insure instantaneous manipulation. Its dimensions are $4\frac{7}{8}$ by $3\frac{1}{8}$ by $4\frac{1}{4}$ inches, and it weighs approximately two pounds.

Weston Film Chart

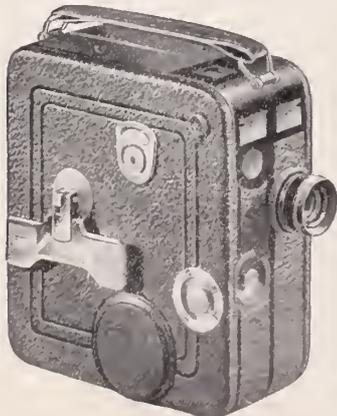
● Weston Electrical Instrument Corporation has issued an interesting and valuable chart for both the still and cine photographer. It is called Weston Film Speeds and can be secured from practically every dealer for the asking.

This chart gives the Weston reading for meters Nos. 617, 627 and 650 of all popular types of film. It gives a very clear and comprehensive outline on the use of Kodachrome.

One other chart of great value to the cine amateur is the "Shutter Time for Motion Picture Cameras." This exposure time is given based on 16 pictures per second.

New 8mm Camera

● Hans Unfried of Buffalo, N.Y., announces that he is importing the German-made Cine Nizo 8mm camera for marketing in the United States.



This camera is furnished with a 12.5mm focal length lens with a speed rating of $f/2.8$. It will run 15 feet of film with one winding. It is adjustable for speeds from 8 to 64 frames per second. In Germany lenses of 20mm, 35mm and 75mm focal lengths are available. It has what is termed a three-in-one finder which serves as direct, indirect and angle viewfinder.

Cine Humidor

● Wm. J. Grace, of Dallas, Texas, announces an addition to his line of useful cine accessories. His latest contribution is the Strongbox Humidor. It is a simple box without the regular catches and locks and hinges. It is built very substantial and comes in two sizes: one for 6 reels of 200 feet 8mm and one for 6 reels of 400 feet 16mm. All six reels are stacked over a center rod, the top of which is threaded to receive the castel nut which holds the top firmly on the case. A piece of $3/16$ by $1\frac{1}{2}$ inch felt in one corner is moistened to keep the films properly humidified.

Camera Accessory

● The photography of wild life usually calls for extreme caution and care on the part of the cameraman. In most cases, it is impossible for him to approach birds and animals sufficiently to secure a reasonably large image on his film. A device which permits camera control from a distance has long been recognized as a definite aid to the nature photographer. E. Leitz, Inc., announces a special remote control device for the Leica camera.

The Leica remote control device consists essentially of a pulley arrangement by means of which two cords release the shutter, and rewind the film and shutter for the next exposure. The length of the cords can be increased to any length required, and permit the cameraman complete and easy control over the action of the camera mechanism.

Tank Agitator

● E. LEITZ, INC., announce a new, domestic agitator. The movement imparted to the developing tank is an oscillating one instead of the usual constant, one-direction movement. The developing tank is merely placed upon the circular platform or table and the switch turned on. A husky motor propels the platform to and fro.

Two models of the Leitz agitator are

available, one for A.C. (alternating current), the other for D. C. (direct current). The two models are identical other than the current for which they are intended.

An accessory to be used in connection with the agitators is an automatic time-switch which permits time intervals of up to 30 minutes to be obtained without any attention from the owner. At the end of the predetermined time interval, the switch shuts off the current automatically.

Special Leica Models

● The Leica camera with its 30 to 36 exposures per loading may not entirely suit some photographers. Some want to make but one exposure at a loading, while others have need to make 100 or more at a loading. In order to accommodate these extremes, E. Leitz, Inc., 60 East 10th St., New York City, supplied the "Oligo" Single Exposure Leica and the Model FF Leica.

The Oligo Model uses tiny metal "plate holders," which will accommodate sections of 35mm film. A ground glass focusing screen and special Ibsor shutter are supplied. All standard Leica lenses may be used with this model.

In the Model FF, the owner has sufficient film capacity to make 250 exposures without reloading the camera. Basically the Model FF is the same as the Model F, excepting for the enlarged ends which accommodate film magazines holding up to 30 feet of film. Aerial, natural color, copy and record photographers often have a need for such a camera.

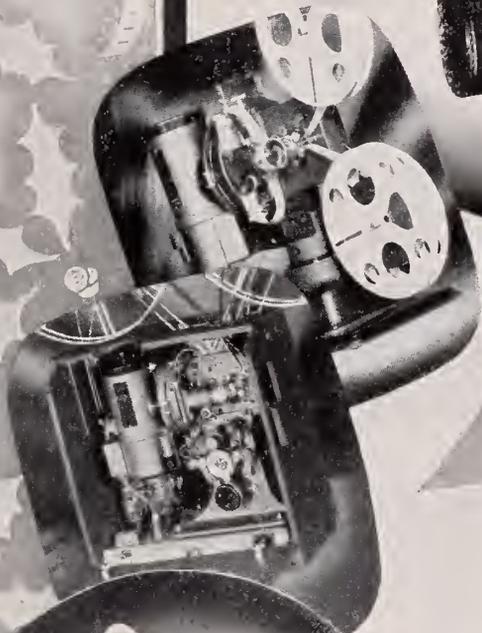
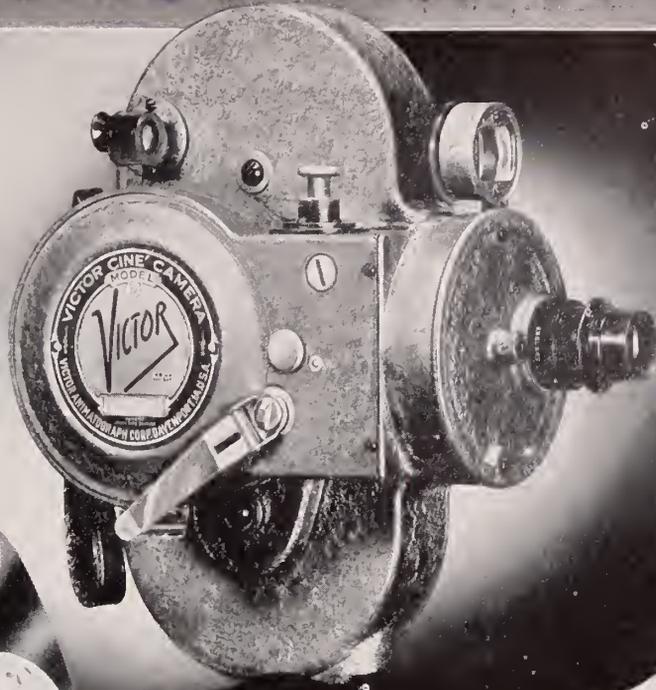
De Vry Sound Camera

● There is always interest among photographers in a new camera. The DeVry

Continued on Page 547



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Interiors Without Lights

Continued from Page 533

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tions. This softer light can usually be reflected very satisfactorily, too, while if necessary, a beam of direct sunlight from another window can be bent around with reflectors, until it is useful. Once one gets the hang of using reflectors, it becomes quite possible to juggle a beam of light from one reflector to another until it is where we need it.

These reflector lightings can be made very successfully on porches, too. A light-colored porch floor is in itself something of a reflector, by the way. Shooting into a porch presents little difficulty; but shooting through, or out from a porch one should remember that the direct and reflected front-light on the subject should be rather strong, so as to minimize the difference in exposure between the subject on the shaded porch and the more brilliantly illuminated background.

And how are reflectors made? Well, the simplest reflector is simply a piece of white cloth, like a sheet, held up in the proper place to throw back some light into the shadowed side of the subject. A very simple support for such a reflector can be made by taking two strips of light wood, and fastening them together to form a T. In use, you simply fasten the sheet onto the cross-bar of the T with pins or thumb-tacks, and then attach the upright of the T to the back of a chair with a strong rubber band. As you usually want your reflector at an angle, you can put a weight on the bottom of the sheet, and adjust the angle by moving the chair to and fro. and by sliding the supporting bar higher or lower on the back of the chair. This type of reflector is useful mainly when the direct light is quite strong, for it reflects quite diffusely. Projection-screens can also be pressed into service as "soft" reflectors.

But more often, a surface that has greater reflecting power will be needed, and it is best to use a reflector more like those used professionally. This type consists of a piece of composition-board or plywood coated with tinfoil. You can make them almost any size that is convenient; it is a good idea to make them in two sections, hinged together like a book, so that when not in use, the reflector can be folded into smaller compass, protecting the reflecting surfaces. A hinged wooden leg at the back will support the reflector at any desired angle. If the reflectors are going to be used indoors a second leg can be hinged at the bottom, and fitted with notches into which the upper leg can fit, thereby avoiding the trouble encountered on slippery floors.

Where you want a very "hard" reflected light, you can use a sheet of tin or a mirror: but the beam from such a reflecting surface is so intense that it is not very pleasing photographically, and hard to control.

On the other hand, when you want to soften the direct light through a window, it can often be done by covering all or part of the window with thin cheese-cloth.

The color of the room in which you are working will have a very important bearing on the sort of picture you will get. If the walls and hangings are dark, they will naturally reflect very little light into the lens—not enough to make any impression upon the film—and about all you will get is whatever is in the path of the direct light through the window, or in the beams of the reflectors. On the other hand, if the walls are light in color, they will reflect more light into your lens, and consequently show up better in the picture.

Following the same idea to its logical conclusion, we can make a very few lights go a long way if we supplement them with daylight—and still farther if we also use reflectors. For instance, using sunlight and a reflector to light our subject, we would probably lose most of the background: but if we use a single lamp, we can add enough general illumination to reveal the background fairly well, too. Used this way, in conjunction with the natural illumination of a room, one lamp—a single, inexpensive Photoflood unit or even a reading-lamp with a Photoflood globe—will enable us to film a surprising range of indoor scenes. As the strength of the illumination varies as the inverse square of the distance between the lamp and what it illumines, we can balance our natural and artificial lighting simply by moving the lamp in or out from the subject. I have made many excellent interiors this way, using a single lamp and sunlight even at times when I had several lamps available; the effect on the screen was more completely natural than if I had tried to avoid the sunlight and use artificial lighting entirely. Some of my finest Kadachrome interiors, too, were made by taking advantage of a beam of sunlight in a light-walled room, and merely filling in with a single electric light.

Many amateurs are inclined to overlook the fact that if they can reflect sunlight, they can also reflect the rays of a photographic lamp. Used intelligently, good reflectors can make a single lamp virtually equivalent to two un-



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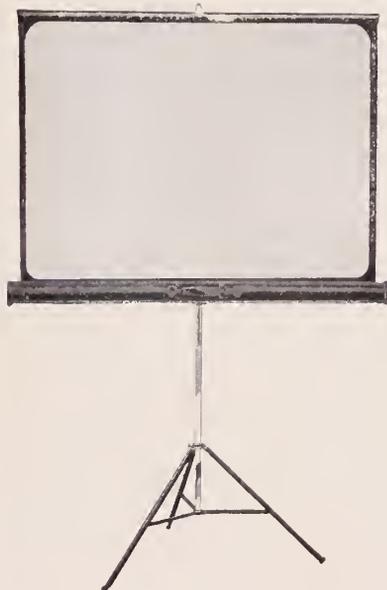
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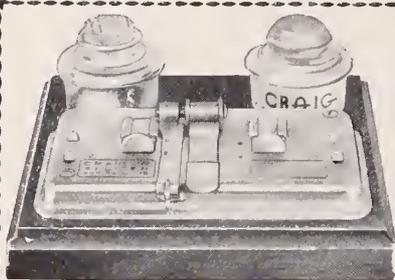
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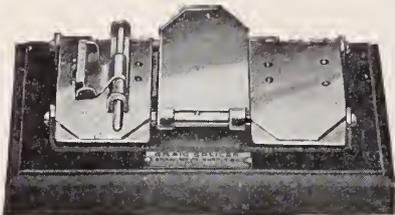
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its, two equal to four, and so on. Anyone whose lighting equipment is limited should certainly try using reflectors.

Finally, by investing a few extra dimes in extension-cords, it is possible to carry your lights outdoors, and to use them for what the professional terms "booster" lighting. In other words, when shooting on shady porches, or in other shaded places near a house, you can use your lights like reflectors—to fill in what would otherwise be heavy shadows.

A while ago, for instance, I was making some 16mm films in a friend's house. There was a chance for a beautiful shot of a man and a girl on a big porch; seating them toward the edge of the porch, I could get a beautiful back-light from the rays of the afternoon sun. But the exposure-problem was perplexing: if I opened up enough

to get a good exposure on the shadowed faces, the brilliantly lit background would be burned up, while if I exposed for the background, I'd lose the more important faces. A reflector would solve the problem nicely—but I had no reflector. So I strung up my lamp-cords together, and brought a 500-Watt Kodalite out onto the porch. Placed beside the camera, it gave me a nice, even lighting on the faces (in this case, a flat front-light would be the most natural effect), and allowed me to balance the exposure between the faces, the strong back-light, and the brilliant background. On the screen, the effect is remarkably natural, without any hint of artificial lighting. And every cinemateur who sees the film asks, "How did you get that shot without burning up the highlights?" The answer is simply—"Filling in the shadows!"

Making Your Own Spotlight

Continued from Page 538

base, and is fitted with a wing-nut and washer by which the lamp can be locked at any position. This is easy to make, but unfortunately, the wing-nut often gets quite warm when the lamp is burned for any length of time, which makes things a bit inconvenient. The other method is to fit a wooden shaft—a strip of doweling will do excellently—to the lamp-base, carrying it out through the back of the lamp. This way, you can slide your lamp in and out of focus, flooding it or spotting it, without risking burned fingers.

The back of the lamphouse should be hinged, to facilitate changing lamps.

It is a good idea to drill several holes along the lower edge of each of the two sides, to allow for ventilation, and to hinge a narrow cover at the top, which can be opened slightly when the lamp is burning, again for ventilation. Too much heat materially shortens the life of a Photoflood. If your handiwork is particularly good, you can make this top ventilator a long, narrow box-like affair, fixed in place, and with ventilating holes in its sides.

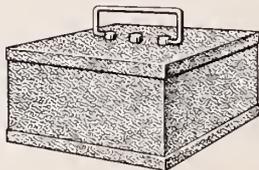
The lens, of course, is mounted in front of the lamphouse. The simplest way to do this is to cut a hole slightly smaller than the diameter of the lens in the frontboard, then to ream out the hole to lens-diameter and about three-eighth inch depth. The lens is fitted into this, with the flat side toward the lamp (that is, inward), and held in place either by a loop of heavy spring-wire, by the little metal fasteners used to hold window-glass, or by putting with plastic wood. Of course, if you're an amateur woodworker and have a lathe, you can turn out a flanged hardwood lens-mount de luxe, which can be fitted in place with screws.

To support the spotlight, you will need a stand which can be raised or lowered, and a mounting which will let you "pan" and tilt the lamp to any angle. A cheap music-stand will do excellently for the stand, while the lamp-bracket can easily be made out of a U-shaped metal strip. Have a threaded hole cut in the bottom of the U, fitting into the top section of the stand, which is also threaded. The tilting movement comes

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naturally from mounting the lamp between the arms of the U, and holding it in place with bolts and wing-nuts.

If you are not such a good carpenter, this same general construction can be carried out in metal, either by yourself or by the neighborhood tinsmith. The lamp-rails, lamp-supporting block, and so on can easily be made up of simple angle sections. Don't however, make the mistake of using too light a weight of metal for your lamp-house: it will be subjected not only to quite a bit of heat, but to a lot of unpremeditated hard knocks, so if you want your lamp to last, use a substantial grade of tinner's galvanized iron. The simplest construction for the lens-carrying front-board of your spotlight would naturally be a casting, which could be held in place with screws; but this is likely to run into more expense than necessary. A less costly construction consists of two metal plates, each with a round hole a shade smaller than the lens. The lens is mounted between these two plates, which can be spaced apart with a layer or two of the asbestos sheeting used for insulating furnaces and baled together. The rear plate can be soldered or welded to the lamp-box, while the front plate is held only by the bolts.

It is rather important when using metal construction to have wooden handles on the operating controls, for the direct metal-to-metal contact transmits heat all too freely.

The inside of your spotlight can be painted with flat white or aluminum paint, though this probably does not greatly increase the power of the lamp; most of the light will be collected from the front side of the globe only. If you plan to use clear, projection-type globes, there is, however, a definite advantage in fitting a small, spherical mirror (likewise from a photo or theatre-supply store) behind the globe, to reflect the rearward rays back to where they can be picked up by the lens. A coat of black paint (or, in a wooden lamp, stain) on the outside of the spotlight always makes for better appearance.

By using different kinds of lamp-globes, you can get different effects with your spotlight. If you use a 500-watt projection-type globe, you will get a "harder," more intense light, with more clear-cut spot-effects, though when spotted down you will also get an image of the filament wires. If you use a regular Photoflood, you will get a much softer effect, with a not quite so definite spot; when spotted down a bit beyond the point of focus, this type of light is very effective for giving sparkle to the eyes in a close-up. Lastly, if you use one of the opal-glass type Photofloods, you will get still softer effects.

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Wheels of Industry

Continued from Page 540

35mm Sound Recording Camera is presented herewith, showing the operating side of this new DeVry product. Beginning at the top, note the adjustable belt idler at the rear of the magazine for positive take-up tension. Film footage counter at the rear of the camera. The focusing lens eye piece is just at the left and a little below the footage counter. Recording lamp socket is at the right of the eye piece. The Tachometer dial slit may be seen just above the motor governor knob. The Precision focusing and view finding is a notable feature.

Microscopic Movies

● Through the cooperation of the Bausch & Lomb Optical Co. and the Eastman Kodak Company, a new apparatus has been designed for making microscopic movies. The use of the 16mm camera has previously been somewhat limited in the scientific field. The cost of fitting up a movie camera to make microscopic movies ran well over the thousand dollar mark and was limited more or less to 35mm cameras and film.

Now the Cine-Kodak Special may be used with a special observation eyepiece, developed by Bausch & Lomb, which acts as a beam splitter. The beam splitter eyepiece is fitted to the front of the camera in place of the regular camera lens. In the beam splitter is a 45 degree prism, silvered but unbacked, which causes part of the light to be reflected to the film and part to be transmitted through the eyepiece so that the operator can observe the action and the field while the picture is being made.

The Observation Eyepiece sets into a flange placed on the microscope eyepiece so that a light tight seal is made between the two elements. This accessory can be fitted to any microscope.

Not only can films be easily made in black and white, but with the new Kada-chrome film pictures in natural color can be obtained. The use of color film with polarized light produces some extraordinary results. The growth of crystals of organic compounds in regular and slow motion, filmed with polarized light, gives a mixture and change of color in the crystals of extraordinary beauty.

"Senior Solarspot"

● Since its introduction several months ago, Mole-Richardson's 2,000-Watt "Junior Solarspot" has made noteworthy strides in displacing the 18-inch reflecting spotlight as the Industry's standard lighting unit. This month Mole-Richardson has announced a larger companion-unit of the same type, the 5 KW "Senior Solarspot," designed to take in the new line the place occupied in older



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The beam of the "Senior Solarspot" may be concentrated to a spot-beam of 10 degrees or less, and flooded out to a spread of over 44 degrees. At the widest spread, the beam is said to retain sufficient intensity to be of photographic value.

The new lamp is a more compact unit than other types of the same wattage. It is built for convenient operation, with the tilt-locking handle carried through the housing to the rear, and all other operating controls conveniently grouped.

Victor Wipe-off

● Broadening the scope of his Du-Morr Radial Wipe for use beyond the Cine Kodak special, J. D. Cochrane, Jr., announces this device now available for the

Victor Model No. 5. This device produces 12 types of wipes with each shape of fan. It weighs only one pound and is said to be easy to operate.

Dalite Unipod

● The Dalite Screen Company of Chicago announces the No. 2 Unipod for holding substandard cameras. This accessory is made of two aluminum tubular members which telescope. The tip of the inner tube is provided with a threaded element to receive the camera; this is protected by an adjustable bakelite knob. By giving the knob a half turn, the Unipod is instantly extended to any length desired up to 17 1/2 inches. It is supported by means of a strap around the neck. When the Unipod is collapsed, it is eleven inches long. It weighs 10 ounces.

Continuity for a Christmas Comedy

Continued from Page 534

Scene 30. CLOSE-UP of Buddy, with his face close to window-glass.

Scene 31. LONG-SHOT through store-window, showing Christmas display of toys.

Scene 32. Medium LONG-SHOT of entrance to a big department-store. Buddy and father go in.

Scene 33. Montage of SHOTS inside toy-department, CLOSE-UPS of various toys—especially electric trains.

Scene 34. Medium LONG-SHOT of Santa Claus, sitting down. A little girl is on his lap. She leaves, and Buddy comes up.

Scene 35. CLOSE-UP of Buddy, talking earnestly.

TITLE: "— an' I want some skates, a sled an' an electric train—"

Scene 36. CLOSE-UP of Santa, nodding approval. FADE OUT.

Scene 37. FADE IN. CLOSE-UP of calendar (stop motion). The leaves melt away until DECEMBER 25 is reached. FADE OUT.

Scene 38. FADE IN. LONG-SHOT in living-room, toward door. The door opens, and Father, Mother and Buddy enter.

Scene 39. CLOSE-UP of Christmas-tree, with presents grouped around it. Very prominent in foreground is a big package that looks as though it might contain a train.

Scene 40. Same as Scene 38. All advance toward camera—Buddy running forward.

Scene 41. CLOSE-UPS *ad lib* of the family opening their presents. Father is seen to get a fine new pipe and some neck-ties, and Buddy opens the big package, revealing a fine electric train.

Scene 42. CLOSE SHOT of Buddy, seated on floor, starting to set up his train and tracks.

Scene 43. MEDIUM-SHOT of same. Father drops down beside Buddy, and starts to help him. They commence to argue: Father apparently wants the tracks one way, and Buddy another. LAP-DISSOLVE (or fade out and in) TO

Scene 44. CLOSE-UP of electric train running around the track, which is arranged the way Father wanted it.

Scene 45. MEDIUM-SHOT of same. Father is playing with the train, having a lot of fun: Buddy is nowhere to be seen.

Scene 46. LONG-SHOT of same. Part of Christmas-tree in foreground, Father and the train in middle distance. Away off in the background, Buddy is seated in a chair.

Scene 47. CLOSE-UP of Buddy in the chair. He has Father's pipe, at which he is looking very disgustedly. Finally he puts the pipe down, and gets up resolutely.

Scene 48. MEDIUM-SHOT. Buddy ap-

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proaches a writing-desk, sits down, draws out a piece of paper, and starts to write.

Scene 49. Insert of letter Buddy is writing. It reads:

Dere Santy:

I got the lectrick trane all write.
But sAy, Santy, you gotta be more careful. Daddy thinks its hiS.
Cantchu do sompn about it sAnty?
If you dont I aint ganna be good no more.

Buddy.

Scene 50. CLOSE-UP of Buddy. He looks off to one side.

Scene 51. LONG-SHOT, past Buddy, to where Father is playing with train.

Scene 52. MEDIUM-SHOT of Buddy. He turns back, and resolutely signs the note.

Scene 53. CLOSE-UP of the train coming straight into the camera.

THE END.

Additional parts can be written into this, of course, for neighbor children, or other members of the family. The street-car scenes are best made on a

Sunday, when there is less traffic. The shot of Buddy in the car can be eliminated if it doesn't seem practical, though in most street-cars it can be made easily on a sunny day. It would be advisable, incidentally, to use the shaded side of the street for a background in this shot, to equalize the exposure. The shots of Buddy, and of Buddy and Father on the downtown streets can be 'stolen' by putting the camera inside a car and shooting through the window. The close-ups of the children looking into the store-window can be made at any time, using any old window-pane for the glass, and shooting so as to miss the frame.

If, as is probable, you can't find enough light in a toy-department to make the Montage (Scene 33) in motion pictures, make it up by copying, (in a title-board) still shots made with a Leica, or photos from toy catalogues, etc. The scenes of Santa Claus can be made at home, with Father doubling for Santa, and a plain white sheet serving as the background, for Santa often uses a tent in toy stores.

Filming Snow Scenes With Filters

Continued from Page 532

beautiful "normal" or "natural" effects. The secret of securing correct tonal quality in snow is, then, in the use of a panchromatic film and a filter.

Another considerable aid in good snow results is an exposure meter. In the winter-time, the light is not nearly so intense as in summer, although the brilliant reflection in the snow may lead one to believe that the light is more intense than it really is. Of course the snow reflects sunlight to a surprising degree and must therefore be taken into consideration, but just how much to allow is something best left to a reliable exposure meter. The photronic cell type of meter is especially recommended, for its infallible readings can be depended upon at all times, whereas the extinction type of meter is apt to lead one astray because of the intensity of the reflected light affecting the eyes when making a reading. Exposure in snow filming is something not to be lightly tossed aside, for it is a vital and influential matter. Probably more footage is wasted yearly because of the lack of reliable exposure than any other single cause. Use a meter, then, for best results.

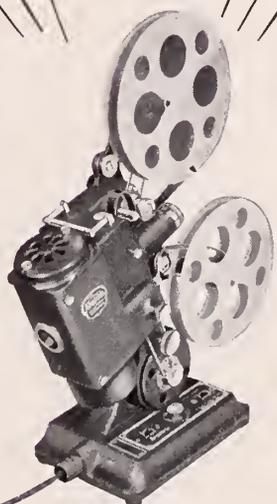
Thus far we have considered only the filming of snow scenes in sunlight. How about when it snows? Isn't there a possibility here? Most assuredly there is, for the dainty flakes falling idly make amazing cinematic patterns on the screen which are well worth recording. Naturally a filter is out of the question in such cases because there is not suf-

ficient illumination, as a rule, to stand it, and secondly there is no purpose in using one. Leave the filter off the lens; use a fast film and a speedy lens—you will be surprised as to what you get.

One delightful feature of snow photography, which has rarely been mentioned, is the photography of what is commonly called hoar-frost. It occurs only rarely, and then lasts only a short while, hence demands the greatest observance and preparedness of the filmer. In early spring, when a rain falls instead of snow, the weather may suddenly freeze, causing the rain-water to freeze, thus coating whatever it covers with a gorgeous, silvery layer which sparkles and shines in the sun's rays. Trees, bare and stark, in the park or in the country, are particularly picturesque, their branches enveloped in an icing which resembles cellophane. If such subjects can be caught in the proper light, fascinating scenes can be captured before they disappear. Icicles, too, when hanging from roof-tops, offer interesting pictorial patterns, and should not be ignored, for a few such odd shots might later fit in splendidly with some other subject-matter.

Of course winter sports should not be ignored. Skating, skiing, tobogganing, and similar activities offer a wealth of material for the serious filmer. It is sometimes difficult to tie such action shots in with picturesque backgrounds, but the enthusiast can usually manage to combine the two into a most effective

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reel. Angle shots are particularly powerful, especially when shooting skaters and skiers. Low angles as a rule are most forceful and should be secured whenever possible, for they are not as common as one might suppose.

Even if no special use can be thought of for such scenes, they should be secured, for when they are needed, they are awfully difficult to get. Therefore, don't lose any opportunities to get snow and ice scenes. If they are pictorial, all the better. Snow subjects are exceedingly rare, and because no dependence can be placed upon the weather, it behooves every filmer interested in snow scenes to get them whenever possible.

Definitions of Elements in Composition

Continued from Page 536

in a mad whirl. The head falls from the body into the waste-paper basket, where most authors' brain-children find peace and rest. By cutting in close-up shots of showing only two eyes looking in the direction of the related action we never let the audience know if they are seeing a living person or if it is really a dummy. In the last fade-out we see the head with all the straw and sawdust strewn about, when suddenly the eyes close in death as a shower of other unwritten plots comes tumbling down upon the headless author until they have quite obliterated our hero, (if we ever had one.) By pasting scare-heads from local newspapers so that they spell the end, you can give a good finish to this nightmare plot.

CAST: Dummy Figure
Hands
Typewriter
Waste-paper Basket

CLOSE-UP: Hands typing out Main Title.

CLOSE-UP: Hands furiously hitting keys.

CLOSE-UP Under-shot of hands in action of typing.

(Use glass to shoot through from under side.)

DISSOLVE into CLOSE-UP of dummy's eyes.

DISSOLVE into CLUSE-UP of dummy's head.

(Cut out masking frame for shooting all shots in dummy's brain.)

CLOSE-UP (FADE IN) First action scene of wheels moving.

DISSOLVE to wheels going in opposite direction.

DISSOLVE into hands hammering with downward motion.

(Increase tempo of this action.)

CLOSE-UP: Eyes looking into direction of action.

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DISSOLVE into quick shots of people's feet, hands, and any moving object.

(Every three or four shots cut back to EYES.)

Note: Build up tempo with quick shot of the harassed brain, until the structural forms melt into one continuous action. In this shot it would be good to let smoke cover the frame and suddenly break into flames.

CUT BACK to eyes. They should have a terror-stricken look.

DE BRIE HIGH SPEED CAMERA: two 400-ft. magazines, De Brie heavy duty tripod, 2" lens. Motion Picture Camera Supply, Inc., 723 Seventh Avenue, New York City; Cable: Cinecamera. T

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CLOSE-UP of head in full frame; hold shot as head starts rocking until it falls from body.

CLOSE-UP of waste-paper basket, head falls into basket.

CLOSE-UP of eyes closing, basket is littered with saw-dust, manuscript paper falls over head and eyes, hiding completely the scene.

FADE OUT and bring in TITLE;

"THE END."

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