

tint, or half shadow, and the rest may go black. This postulate we may use as a medium. Varying the proportions will control the effects we may be creating.

The Handling of Quality Elements

In dealing with shadow as an element of our scene, we must recognize the fact that in interior motion pictures we build our scene from a completely unlighted back ground. This is an opposite method to that employed in most of the graphic arts. It resembles wood cuts and their manufacture; we carve out of blackness with our spotlights those parts of the scene from which we derive an exposure.

Procedure

1. Acquiring a pleasing design for the scene demands that first we visualize a two dimensional plan. We mean by this that modeling, or the three dimensional aspect, must be ignored when studying the light and dark scheme. This is accomplished by use of a dark glass, or half closing eyes. In this manner the mezzotints fade, and we are conscious solely of the black and hot patches.

2. Close-ups demand that we use fewer elements. A longshot permits more complexity of the component elements.

3. The use of the wide angle lens and the longshot require that the entire scene be more completely lit, and the darker patches broken up and raised in tone value. We must do this in order that the blacks will not be heavy and break up the unity of the scene as a whole.

Suggestions for Employing Tone or Quality Elements to Promote the Emotional Aspect of the Scene

1. Unity

One postulate in rendering a scene in motion pictures is that the scene must conform to the scenes already shot and those which will be shot. Moreover, the individual elements of the particular shot must bear a distinct relationship toward each other. Whatever the action, however the grouping of the actors, whatever the background, these diverse elements must be unified into a coherent rhythmic whole. If two masses or groups divide the scene and the interest, the spectator is confused. If a large number of masses of light and shadow are present, the result is to confuse and irritate.

2. Rhythm

Rhythm may be introduced into a scene in a number of ways. Agitating a tree which produces a shadow, moving an object such as a hanging lamp so that it appears to be swinging in the breeze makes the scene live. Life may be introduced into the scene in even a static manner. Sharp contrast, suggested movement, the use of *line*, which we shall take up later—all tend to promote vitality.

3. The Deft Touch

This next condition for promoting emotion is difficult to define. Subtle indication of the object of interest... characterization of the single important feature of the object is sometimes all that is required. It is that feeling gained by the escape, say, of bald statement. It implies sacrifice of immediate force and contrast to gain an impression. The introduction, perhaps, of a component not

too clearly defined. A net over a certain portion of the camera lens might do it. Perhaps we might employ the vignette for only a portion of the scene. Rembrandt used this aid extensively. Leaving something to the imagination, he found, gave his pictures a quality few artists were able to duplicate in painting.

4. Repose

Another element which promotes emotion is that of *repose*. The word suggests good taste. It suggests the removal of too sharp contrast. It demands that the scene fulfill its function, and purvey its ordained effect; not flamboyantly by the simulated projection of violent color and mass or turbulent line, but nicely, and in the mannerly way.

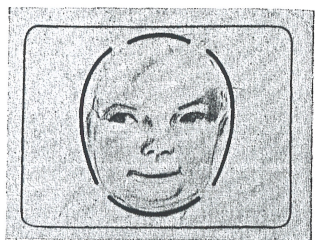
The Nature of Line in Photographing Motion Pictures

"The simplest possible conception of a picture is an arrangement of lines cutting into a rectangular space, in such a way as to make it interesting," says Arthur Hammond in his book on pictorial composition. Our motion picture scene, though devoid of lines such as are used in drawing, etching, et cetera, is nevertheless, governed by the principles of linear form. These affect all presentation whether it be with brush, pencil or camera.

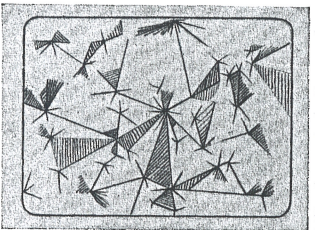
We do not presume to suggest that there should be obvious, unbroken lines running through our composition. Rather, that there should be lines made of points of interest and centers of attraction. Such breaks as are necessary may be skipped by the eye in such a way that they provide variety and interest. In much the same manner that we group our masses of light and dark, so do we arrange the objects and accents in our picture in such a way that the eye may follow the contours along the path we desire it to pursue in observing the scene.

The Pyramid

The pyramid is one of the most frequently used of fundamental forms. It is the secret of most stable and compact designs. In closeups the head forms the apex to the shoulders. The apex of the triangle is often placed *below* the base by the introduction of some smaller feature of interest. This serves as a link to tie the masses together, so that the triangle becomes a quadrilateral. The master Raphael used the quadrilateral or diamond shaped plan extensively. Carried to an extreme the quadrilateral form becomes round or oval. We then



lack the firm lines that make for power. Few firm, stable designs are found that do not use the pyramid as their basic form.



Straight Lines

Straight lines suggest dignity, manliness, vitality, security. Points and angles derived from them suggest excitement or frenzy. If straight lines are used to excess, harshness and irritation are the result.



Curved Lines

Curved lines express flowing beauty. These are recommended for fine pictorial structure. Hogarth, in his book, "Line of Beauty," contends that the most perfect line is a curve which resembles

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The Zoomar Lens

By Frank G. Back, M.E., Sc.D.

(Research and Development Laboratory, New York)

THE Zoomar varifocal lens was first demonstrated in public at the Spring Convention of the S.M.P.E. in May, 1946, and has since then been accepted by the motion picture profession. During the short time it has been in use it has proved a valuable tool in the field of scientific educational, industrial, and commercial film production.

Though the Zoomar is a result of long and painstaking research, the final development has been greatly speeded up by the recent war. By developing various instruments for the armed forces, which in one way or another involved varifocal optical systems, valuable experience was gained. The Varifocal Viewfinder PH-532/UF for example, designed for the combat cameras of the U.S.A. Signal Corps, used for the first time the principle of a single barrel linear movement to produce a change of magnification. The same principle is also employed in the Zoomar lens. This principle, which distinguishes itself from every other varifocal optical system produced so far, guarantees perfect functioning of the instrument regardless of the inevitable wear of the mechanical parts.

At the present time the Zoomar lens for 16 mm. cameras is in production and on the market. The Zoomar lens

for 35 mm. film is still in the laboratory stage but will be available very soon.

The technical data of the 16 mm. Zoomar Lens are:

Length 12". Width 3 1/2". Height 1 1/2". Weight 1 1/4 lbs.

Aperture Range: f:2.9 to f:22.

Range: Interchangeable Wide-Angle Front-Lens. Zoom Range: 17 mm. to 53 mm. Distance Range: 4 ft. to inf. (Close-up Attachment for Wide-Angle Front-Lens permits shooting at any specified distance down to 1 inch, covering an area as small as a postage stamp. Lens can be zoomed as usual.)

Interchangeable Tele - Front - Lens Zoom Range: 35 mm. to 106 mm. Distance Range: 14 ft. to inf.

Field Coverage: Difference in field area in any one continuous shot—9 times. Difference in field area in compound zoom shot using both front lenses —36 times.

The technical data of the 35 mm. Zoomar Lens are:

Length 24". Width 6". Height 2 3/4". Weight approximately 9 lbs. Aperture Range: f:4.5 to f:32.

Range: Interchangeable Wide-Angle Front-Lens. Zoom Range: 40 mm. to

120 mm. Distance Range: 8 ft. to inf. (Close-up Attachment for Wide-Angle Front-Lens permits shooting at any specified distance down to 2 inches, covering an area as small as a postage stamp. Lens can be zoomed as usual.

Interchangeable Tele - Front - Lens. Zoom Range: 80 mm. to 240 mm. Distance Range: 30 ft. to inf.

Field Coverage: Difference in field area in any one continuous shot—9 times. Difference in field area in compound zoom shot using both front lenses —36 times.

The general situations under which the Zoomar lens may be used successfully are scenes necessitating a transition from a total view to a medium plane, or from a medium shot to a close-up. In all these situations, where formerly a trucking shot was required, practically the same effect can be achieved with the varifocal lens.

Any scene of a dialogue between two or more persons, in which the cameraman plans to start with a total view of the situation and then concentrate on one of the persons, can be produced with greater speed and less expense by using the Zoomar lens. The usual procedure can be reversed and the scene can start with a close-up of one speaking person and then the picture may quickly extend into a medium shot, bringing the rest of the company within the frame.

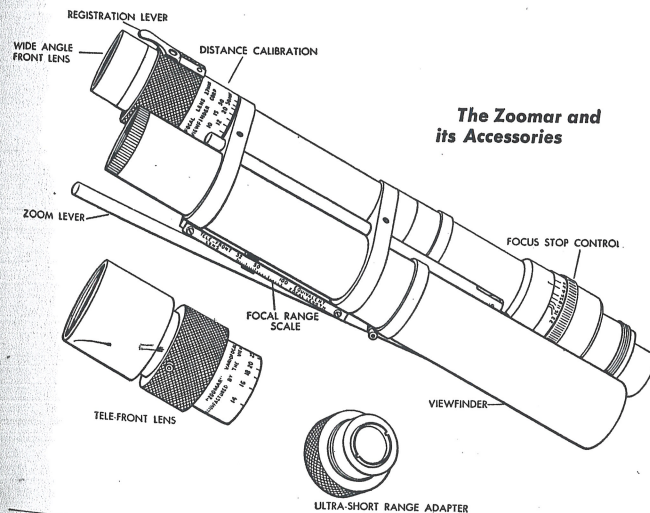
In many cases the use of two or more cameras can be eliminated and an effect similar to cross-cutting can be achieved with the Zoomar lens without the costly loss of valuable studio time by alternating telescopic view and wide-angle shots.

This becomes especially important in the production of musical pictures where the necessity of continuous and uninterrupted shooting of each scene is even greater.

Many of the difficulties of the parallel editing of picture and sound of a musical film sequence—be it playing of a classical string quartette, modern dance music or even of a composition for large orchestra—can be eliminated by shooting the scene with the Zoomar lens.

Striking effects can be achieved by combining the zoom shots with panning. The employment of both a crane (or a dolly) and the Zoomar lens should make it possible to render any shorter composition in one continuous shot,

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The Zoomar and its Accessories

Current Assignments of A. S. C. Members

As this issue of AMERICAN CINEMATOGRAPHER goes to press, members of the A. S. C. were engaged as Directors of Photography in the Hollywood studios as follows:

Columbia

Charles Lawton, Jr., "The Lady From Shanghai," with Rita Hayworth, Orson Welles, Glenn Anders.

Edward Cronjager, "Three Were Throughbred," (Technicolor) with Robert Young, Willard Parker, Marguerite Chapman, Akim Tamiroff.

Burnett Guffey, "Assigned to Treasury," with Dick Powell, Signe Hasso, Maylia, Ludwig Donath, Vladimir Sokoloff.

Henry Freulich, "Major Denning's Trust Estate," with Gloria Henry, Paul Campbell, Harry Davenport, Mark Dennis.

Eagle-Lion

L. W. O'Connell, "Repeat Performance," with Louis Hayward, Joan Leslie, Richard Basehart, Tom Conway, Benay Venuta.

Metro-Goldwyn-Mayer

Hal Rosson, "The Hucksters," with Clark Gable, Deborah Kerr, Sydney Greenstreet, Keenan Wynn, Ava Gardner, Adolphe Menjou, Edward Arnold.

Charles Rosher, "Song of the Thin Man" with William Powell, Myrna Loy, Keenan Wynn, Jayne Meadows, Leon Ames, Patricia Morison.

Monogram

Paul Ivano, "The Gangster," (King Bros.-Allied Artists), with Barry Sullivan, Belita, Joan Loring, Akim Tamiroff, Henry Morgan, Pifi Dorsay.

Paramount

Leo Tover, "I Walk Alone," (Hal Wallis Prod.) with Elizabeth Scott, Burt Lancaster, Kirk Douglas, Wendell Corey, Kristine Miller, George Rigaud.

Ernest Laszlo, "The Road to Rio," with Bing Crosby, Bob Hope, Dorothy Lamour, Gale Songergaard, Frank Faylen, Joseph Vitale.

Fred Jackson, Jr., "Albuquerque," (Clarion Prod.-Pine Thomas) (Cinecolor) with Randolph Scott, Barbara Britton, George (Gabby) Hayes, Russell Hayden, Lon Chaney.

PRC

Jackson Rose, "Stepchild," with Brenda Joyce, Donald Woods, Terry Austin, Gregory Marshall.

Jack Greenhalgh, "Too Many Winners," with Hugh Beaumont, Trudy Marshall.

Republic

John Alton, "The Trespasser," with Dale Evans, Janet Martin, Warren Douglas, Adele Mara, Douglas Fowley, Grant Withers.

RKO

Frank Redman, "If You Knew Susie," with Eddie Cantor, Joan Davis, Allyn Joslyn, Sheldon Leonard, Douglas Fowley, Sig Ruman.

Robert de Grasse, "Indian Summer," with Alexander Knox, Ann Sothorn, George Tobias, Myrna Dell, Florence Bates, Sharyn Moffett.

Harry Wild and W. Howard Greene, "Tycoon," (Technicolor) with John Wayne, Laraine Day, Sir Cedric Hardwicke, Anthony Quinn.

Gregg Toland, "The Bishop's Wife," (Samuel Goldwyn Prod.) with Cary Grant, Loretta Young, David Niven, Monty Woolley, Marsha Anne Northrop.

Selznick

Lee Garmes, "The Paradine Case," with Gregory Peck, Ann Todd, Charles Laughton, Charles Coburn, Ethel Barrymore, Louis Jourdan, Joan Tetzl, Leo G. Carroll, Colin Hunter, Valli, Lester Matthews.

Twentieth Century-Fox

Leon Shamroy, "Forever Amber," (Technicolor) with Linda Darnell, Cornell Wilde, Richard Greene, Glenn Langan, George Sanders, Leo G. Carroll, Margot Grahame.

Charles Clarke, "Miracle on 34th Street," with John Payne, Maureen O'Hara, Porter Hall, Philip Tonge, James Seay, Edmund Gwenn, Gene Lockhart, William Frawley.

Joseph LaShelle and Arthur Arling, "Captain from Castile," (Technicolor) with Tyrone Power, Jean Peters, Cesar Romero, Lee J. Cobb, John Sutton, Antonio Moreno, Thomas Gomez, Alan Mowbray.

Charles Lang, "The Ghost and Mrs. Muir," with Gene Tierney, Rex Harrison, Edna Best, Robert Coote, Natalie Wood, Isobel Elsom, Victoria Horne.

United Artists

Karl Struss, "Heaven Only Knows," (Nero Films) with Robert Cummings, Brian Donlevy, Jorja Curtright, Marjorie Reynolds, Bill Goodwin, John Littel, Stuart Erwin.

Franz Planer, "Vendetta," (California Pictures) with Domergue, George Dolenz, Hillary Brooke, Nigel Bruce.

James Wong Howe, "Body and Soul," (Enterprise) with John Garfield, Lilli Palmer, Hazel Brooks, Ann Revere, William Conrad.

Universal-International

Stanley Cortez, "Secret Beyond the Door," (Diana Prod.) with Joan Bennett, Michael Redgrave, Natalie Schafer, Rosa Rey.

William Daniels, "Brute Force," (Mark Hellinger Prod.) with Burt Lancaster, Hume Cronyn, Charles Bickford, Sam Levene, Jeff Corey, Ann Blyth, Ella Raines, Yvonne De Carlo.

Warners

Ernest Haller, "The Unfaithful," with Ann Sheridan, Zachary Scott, Lew Ayres, Steven Geray, Eve Arden, Peggy Knudsen, John Hoyt.

Woody Bredell, "The Unsuspected," (Michael Curtiz Prod.) with Joan Caulfield, Claude Rains, Audrey Totter, Constance Bennett, Michael North, Hurd Hatfield.

Karl Freund, "Wallflower," with Joyce Reynolds, Robert Hutton, Janis Paige, Edward Arnold, Barbara Brown, Don McGuire.

Lenten Films Available Through United World

United World Films, which recently acquired the Bell & Howell Filmosound library for distribution of 8 and 16 mm. films, reminds that a number of special Lenten subjects are available for bookings through its offices.

List includes: "Journey Into Faith," "First Easter," "Crown of Thorns," "Jesus of Nazareth," "Passion Play"; and the "I Am the Way" series of 13 silent subjects edited from "The King of Kings."

The Zoomer Lens

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which later could be matched to the sound track without the need of special editing. The Zoomar lens has proved extremely useful in other fields also.

It is easy to imagine the difficulties of a cameraman covering a session of the United Nations Assembly, or any other formal meeting, from the press and film gallery. Very often, long sequences of one speaker are required and with only one camera available, the exchange of lenses on a turret-camera head is not rapid enough to assure an uninterrupted flow of pictures of the speaker.

A variable focus lens fitted to the camera will guarantee an absolutely continuous picture flow and achieve the vividness and variety of closer and wider shots which up to now were only a cameraman's dream. The same goes for the filming of any official functions, such as the inauguration of a president, the celebrating of High Mass in a cathedral, or of any scene where the solemnity of the occasion makes it impossible for the cameraman to weave around for closer or wider shots. In such situations, one cameraman has the possibility of filming from one fixed position, both the main celebrities of the event and the public as the use of the Zoomar lens makes it unnecessary for him to change the position of his camera.

While filming great sports events the newsreel cameraman may find himself in a similar situation. The exchange of lenses or the turning of the turret head of the camera often requires refocusing or resetting of the stop, which means considerable loss of time. A football or a fast tennis game can be filmed in a more vivid, more interesting, and more satisfactory way if the Zoomar lens is used. Thus one focusing gives a sharp definition of the picture for any position of the focal lever and no changing of the stop is necessary because the relative aperture remains unchanged throughout the zoom.

In spite of its versatility the Zoomar lens was by no means designed to replace the other camera lenses now in use. Its main purpose is to serve in situations where other lenses or other technical means would fail; or where their performance would be inferior to that of a varifocal lens. A cameraman specializing in the travelogue field will encounter many such situations. Filming historical buildings he will want to show architectural details such as the interestingly sculptured capitals of columns, antique clocks, weather vanes on interestingly sculptured columns of capitals, antique clocks, weather vanes on church steeples, or gargoyles, etc., but for obvious reasons it would be impossible to make such close-ups. Abrupt

transition from an ordinary overall view to a telephoto shot would make the whole thing confusing as these details are generally too small to be detected on overall shots. The gradual transition by a zoom shot not only guides the attention of the spectator to that particular detail, but it also shows him where this detail is located. A 36 times enlargement of a detail will generally be sufficient even if the building to be filmed is across a river, or situated upon an inaccessible hill top.

The same problem arises in educational pictures of all kinds. It is a standard practice to draw attention to important details by close-ups. But such a close-up tells only half the story if it does not show how this detail fits into the whole.

In industrial pictures another factor has to be considered. The customer who commissions these pictures usually does not wish to incur the additional expense of stopping the work in his factory and having the workers pose for the cameraman. The latter, therefore, usually has to work while work at the plant is in full swing and is thereby greatly handicapped in his movements. It is certainly a boon if he can zoom from long shots to close-ups of machinery and processes without getting too close to the workers, endangering himself, or obstructing the flow of work.

In the production of geological and other nature films, situations may occur in which it would be desirable to show the inside of a crater, the bottom of the Grand Canyon or similar inaccessible spots. The Zoomar lens, with its telescopic extension, makes it possible to render in large size any desired close-up of a geological formation.

The spectator of such scenes will permanently keep in mind the exact location of such a detail and will be conscious of its proportions, its correct size and its relationship to the whole phenomenon.

The Zoomar offers nearly unlimited possibilities in the field of trick-shots and special effects. A rapid zoom taken from a high roof top with a camera tilted downward gives the impression as if the cameraman were falling from great heights, an effect which can hardly be achieved otherwise. On one occasion the script required a pilot's view of a dive bomber going into a dive. The shot was first taken from an actual aircraft, the cameraman sitting beside the pilot. These pictures proved to be a complete flop because during all the tries the cameraman either "blacked out" completely or got so excited that he forgot to operate his camera properly and at the right time. Finally, the shot was taken from the top of a high stationary structure and the dive simulated by co-ordinated tilting of the camera and operating of the zoom lever;

the result could not be distinguished from the real thing.

The foregoing example shows a deviation from one of the basic rules of orthodox camera technique, namely, that every camera movement has to be slow and steady; this rule was broken to simulate the impression of falling, diving and so on. But the unorthodox, rapid, even hasty zoom itself is a powerful tool to express dynamic definite emotions like fear, terror, anxiety, etc., especially in the field of the modern artistic films. These films try not so much to give a photographically faithful record of actual happenings but to convey the mood and impressions of the protagonists.

In animation and cartoon work the Zoomar lens will be greatly appreciated for the many shortcuts which it offers.

The same problems which confront the motion picture cameraman are also encountered in another field which is still in its infancy; television. Here, the situation is aggravated by the fact that the video equipment is much clumsier than the motion picture camera and cannot be as easily moved around. Everything previously said about motion picture work, especially newsreel and documentary reporting applies to an even greater extent to telecasting. A varifocal lens similar to the motion picture Zoomar but adapted to the special needs and conditions of television work is now in preparation.

Thus, when video takes its rightful place beside stage, screen, and radio it will have the necessary tools not only electronically but also optically to live up to any situation which may arise.

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