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Adventurous Film Making

J. David Beal



Adventurous Film Making

Adventurous Film Making (1980) looks at some more ambitious and interesting techniques and shows how these serve film makers in expressing their ideas. This volume spans every kind of film: travel, action, recreations of the past, visual and verbal comedy, the natural world, cartoon and puppet animation, true-life adventures, sporting events, fantasy and science fiction. It focuses on the more advanced use of equipment, and discusses all aspects of shooting and editing, and also reveals for the first time the particular methods chosen by some of the most talented and successful amateur film makers, each an acknowledged specialist in their chosen field.



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J. DAVID BEAL




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David Beal

I — *Procedures with a purpose*

THE thoughtful film maker exploits to the full the creative potential in the superb colour film material now available. Decisions have to be made again and again about colour elements in a scene. They should be in keeping with the mood of the sequence. If the mood is placid or sad, colour effects are generally best kept subdued and pastely. This may be achieved in either of two ways—by careful selection of shots to exclude bright colours, using medium shot more often than long shot; or by shooting in somewhat veiled lighting, perhaps on an overcast day or with bounced artificial lights. For a lively scene on the other hand, you may need bright, even garish colours.

It is natural for the movie maker to seek out the sunshine, and this may be valid when the subject is, say, a cheerful market scene. Splashes of vivid colour are frequently just what the sequence calls for and a natural overall warm colour cast, such as occurs in the evening, might also be welcome.

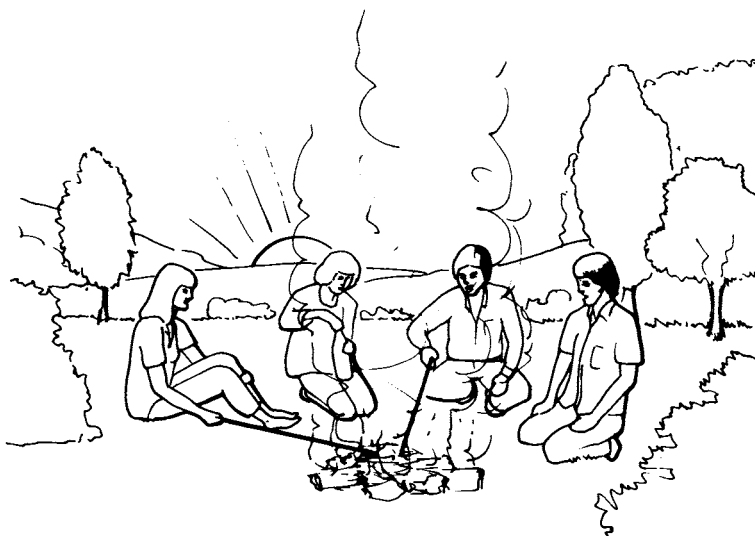
But all life is not sunny and bright, and close-ups in the shadows, of a suitable subject, have their own distinctive appeal. The creative film maker is often searching for truth, and should not accept a glossy surface impression.

The usual manual override method (using short distance or long focus for exposure determination) should be employed in certain circumstances, especially when there is high contrast in

the scene. You could be filming an Italian shoemaker at his work in a back shop, visible from the brightly lit street. The sun-bathed white doorway is the least important part of the shot, so you meter the exposure for the interior at maximum focal length, zooming out a little before shooting. A through-the-lens exposure system helps to give an accurate setting in such cases.

Shooting against the light

The really contrasty shots are those taken partly or fully against the light, or *contre-jour*. Effects produced in this way can include a carefully chosen silhouetted foreground shape,



Light and colour are subdued in this shot of campfire smoke rising gently in the evening; *contre-jour* lighting adds to the effect of the smoke.

such as the gleaming edge of a human profile, luminously transparent leaves or petals, campfire smoke rising enticingly in the evening air, the glitter of rippling water, or indeed the familiar but enchanting last stage of a sunset on the Isle of

Skye or somewhere equally romantic. In most of these cases an automatic meter system gives a good rendering, as long as shadow detail is not required.

In general, it is important to decide whether you are going to build your scenes with colour contrasts and harmony, or whether you intend to play down the colours and mould the subject elements with light and shade. This is often the factor that determines whether or not you are going to take the advice in the camera instruction book and film with the light source behind you. If you opt for *contre-jour* rather than flat lighting, it might be advisable to use it right through the sequence, or perhaps, Hitchcock-style, as a sort of visual leitmotif recurring throughout the film.

The shadows produced in *contre-jour* shooting have their incidental—and often vital—uses. They may be sombre or even frightening. They may, in fact, provide a temporary hiding place for a menacing or evil or ghastly character, who is suddenly (or slowly) revealed when he steps out into the oblique lighting.

Use a lens hood with *contre-jour*, and make sure (by careful scrutiny through the viewfinder) that the lens elements are not reflected into the picture—unless indeed you are fond of lens reflections.

Composing the viewfinder image

Scan the viewfinder image thoughtfully before every shot, deciding on your centre of interest and placing that feature in the situation for optimum effect in the frame. As a film maker you are in a quite different position from the still photographer working with monochrome or colour prints, who can expose a general shot and attend to the final composition of the picture at leisure in the darkroom. You, the film maker, must compose once and for all in the viewfinder. You have no alternative to the pleasing 4:3 format (favoured also by generations of artists), unless you have opted for one of the widescreen systems. The latter come fully into their own

when the chosen theme, like *Baskeyfield VC* or *Escape from Hotlitz*, involves a number of vistas in long shot; and these would seem to call for 16 mm enlarged on to a really massive screen appropriate to the spectacle depicted.

Whatever the gauge or format, there is often the possibility of a 'frame within a frame'. Thus, if the centre of interest as seen in the viewfinder is inherently vertical—a giant Douglas fir dominating the woodcutter, or a tall menacing westerner striding to camera—it might be advisable to have a foreground element on one side or both, perhaps a gateway, to reduce the width of the main part of the scene.

Another creative factor, and a most useful one, is focus. A proven device for directing the viewer's attention to the centre of interest is to make its image sharper than that of nearer or more distant objects. Unfortunately, the great depth of field of 8 mm often makes this impossible. The *Citizen Kane* technique of 'deep focus' at extreme wide angle is not applicable to every shot or to every theme. It might be more appropriate to focus on a distant object, perhaps a mountain, if it is of the main subject. The depth of field should then be insufficient to keep the foreground sharp. Low light levels can help to make the focusing noticeably differential by obliging you to open the lens to a wider aperture.

The factor that must be ever-present in your mind as you compose a shot is that of movement. Your meticulously planned classic composition abruptly loses a lot of its significance when the centre of interest begins to move across the picture. And that is as it should be. Film is nothing without movement.

Points of view

Part of the attraction of film as a medium of communication arises from the constantly changing viewpoints occupied by the camera, and hence eventually by the audience. It became accepted very early in the history of cinema that a complete

change of viewpoint several times each minute, far from being jerky and disturbing, gives a remarkably smooth flow to the film. Straight cuts from one shot to the next are more prevalent these days than ever before.

A comparison with human perception shows that this is in fact the way we observe—not calmly and placidly and turning from side to side in gentle panoramic movements, but abruptly and with frequent changes of the objects observed. The real difference is that we do not jump about physically, changing our viewpoint, every few seconds, but generally make all the alterations of viewing angle from the same spot—for all the world like a film cameraman standing in one position but shooting several subjects briefly in turn.

To most of us, however, changing camera-to-subject distances, either real or apparent, are not only acceptable, but indeed an essential part of cinematic grammar. We expect, for instance, the traditional series of shots to open a sequence; long shot to establish the environment—cut to medium shot introducing characters—cut to close-up revealing subject detail. This acceptance should not prevent the film maker on occasion from reversing the order—a good way of arousing some degree of tension.

Film, of course, like any other art form, is not a representation of reality, but is a blend of tradition, contrivance and original thought. Therein lies much of its fascination.

A radical alteration of viewpoint and/or distance, between shots, is necessary for many reasons: for avoidance of the obtrusive jump cut, for clarity and detail, for involvement of the camera as participant rather than as spectator and simply for aesthetic variety. There are also artistic and thematic reasons for the camera taking up certain stances, all familiar and acceptable to audiences—high for subject inferiority, low for subject menace, half-concealed for mystery and secrecy, and so on.

The camera may symbolize mood or atmosphere simply through its position. A slant or cant to one side can be used for

depravity or menace if desired. A return to the vertical position in such cases signifies a normal state of mind, or else danger past.

The slanting camera may be used for other purposes. A tall spire looks much more splendid if shot at 30° from the perpendicular. A shot of an intrepid mountaineer clinging to a cliff face is more exciting if the camera is canted sideways slightly, and indeed the camera can cheat and make a 60° slope seem vertical. A road seen from the side can in the same way be made to appear much steeper than it is. Like all optical contrivances, however, the slanting shot should not be over-used.

An important factor in adding interest and variety to a film is the use of the 'opposing shot'—that is, a shot taken from the position of the subject of the previous shot. The opening sequence of the classic Swedish documentary *Rhythm of a City*, for instance, shows seabirds wheeling over Stockholm, alternating with aerial bird's-eye shots of the streets below. The entire film is an object-lesson in the intelligent use of changing camera viewpoints. To take a fictional example, a fugitive is seen stumbling and staggering through the forest, glancing back despairingly; cut to police with dogs in hot pursuit, then back to fugitive, and so on. Of course, the standard use of the opposing shot in the cinema and in television drama is in dialogue scenes, where a conversation between two characters is filmed with alternate cuts from one to the other—but not so regularly as to become obvious and tedious.

Wide-angle and telephoto shots

Much of the effectiveness of a shot depends on the width of scene taken in by the camera, and here the ubiquitous zoom lens comes into its own. The true function of this invaluable device is to allow the camera operator to determine and set the extent of the shot before he starts shooting. It makes up for the cinematographer's inability to enlarge sections of a scene afterwards in the darkroom in the manner of the still photographer.

The zoom lens is a great saver of time and shoe-leather. The long-focus end (generally referred to as telephoto) enlarges distant objects, whereas the short-focus end (wide-angle) allows the filming of extensive areas. These obvious uses, however, by no means exhaust the creative possibilities.

Wide-angle, say 7 or 8 mm, provides remarkable depth of field, especially on 8 mm formats, enabling you to focus equally sharply on a ringing telephone near the camera, dominating the scene, and a man entering the door at the far end of the room. Any movement by a subject toward or away from the camera is greatly exaggerated by a wide-angle setting: this is ideal for chase sequences, the approaching train, shots from the front or rear window of a speeding car, and so on. But it is useful too as a steadier of movement, say in a shot from an Alpine chairlift, or in a shot of a water-skier from the stern of the towing speedboat. It is also generally better to use wide-angle when panning to reduce the effect of camera shake.

Short focus exaggerates perspective. Its notorious distortion of the human face must be avoided at all costs if you are to remain on speaking terms with your subject afterwards; noses and ears especially assume repulsive proportions. But then, this might be exactly what you want.

Telephoto, on the other hand, compliments the subject by underplaying his nose and generally toning-down defects of that nature. This setting has additional advantages which make it vital to every thoughtful film maker. Owing to its very limited depth of field, a setting of, say, 48 or 56 mm enables you to select whichever plane of sharpness you desire to emphasize. Unwanted backgrounds are easily blurred in this way, and this may greatly clarify the scene. This property of long focus makes it obligatory for use when focusing.

The dramatic effect of telephoto is most useful too. A jostling crowd at a demonstration looks much more exciting when shot at long range with the resulting compression of perspective. You can use telephoto, of course, to get details of an inaccessible

pinnacle, to film a timid creature like a woodpecker or a deer, or to observe the social scene unobtrusively—perhaps filming two Greeks discussing politics over a glass of ouzo at a table on the opposite side of the street. When filming children I find myself using telephoto repeatedly. Some steadying device is essential, be it merely a tree or a railing.



To be really unobtrusive, it is often advisable to use the long focus setting and take up a distant position. Here the two old men sip their drinks, unaware that they are being filmed. The cameraman leans against a wall for steadiness as camera shake is a danger at a telephoto setting.

Movement of the subject

In photography you capture an instant in time for subsequent contemplation at leisure; in cinematography you record and edit a series of interrelated movements for subsequent viewing as a programmed sequence. The two media are so different, even irreconcilable, that some believe the temperament of a film maker can have nothing in common with that of a still photographer. Movement is fundamental

to the film medium, and every beginner is urged in manuals, articles and books to 'let the subject move'. But this rule, like many in cinematography, is made to be broken. Movement on film may be very slight. The faint stirring of a leaf or of a pool's surface can be an admirable subject for filming, perhaps as a deliberate contrast to turbulent scenes in a previous sequence. There is even a place in a film for shots devoid of motion altogether.

An establishing shot depicting a wide desert landscape may be motionless and might be held for as long as ten seconds, if it is in keeping with the mood of the film. Soon, however, the audience will become restive, expecting motion of some kind, even if it is only caused by the stirring of a gentle breeze.

There are successful films that contain no subject movement from start to finish—a denial, some might say, of the whole purpose of film. An excellent film has been made on the theme of postage stamps, wherein all the movement was made by the camera itself or by adjustment of its lens. While this is undeniably exceptional, it is a valid use of the film medium, applicable also to Super 8 audio-visual self-instruction units in education as a simple and inexpensive alternative to slide-tape sequences.

Artistic and architectural masterpieces are suitable static subjects for movie film. The camera plays the part of the interested spectator, moving lovingly along walls and up stairs, coming gently to linger where necessary to investigate a detail of statue or picture, and placing the whole subject in its setting. Tasteful and appropriate sound—though not necessarily speech—would seem to be necessary.

However, the major part of almost every film contains purposeful and natural movement, faithfully recorded and projected afterwards at identical speed. The filming of lethargic creatures like tortoises, and of somnolent or sleeping human beings, raises few problems. The usual procedure is to keep cutting away to a concurrent event or to a spectator's face, before returning to the slow mover at a later stage, thus

acceptably speeding up the action.

For swift subject movement, problems of a different sort are raised. By the time you have set the focus and aimed, the aeroplane is out of sight, unless you have been very quick on the uptake. Here you see the wisdom of keeping your camera set ready to shoot.

A fast-moving vehicle is generally best captured approaching or receding, not in side view, and the focus should be set to be sharp at the point where the frame will be filled with the moving subject. From the side, however, it is possible to get a clear shot of, say, a passing express train, by moving the camera to keep pace with it, and ignoring the inevitable blurring of the background.

With athletic events and car or motorcycle races, there are places around the course where the best shots are to be obtained. These occur generally at corners, where experienced film and television cameramen often take up a stance. The camera should be panned with the subject held just approaching the centre of the viewfinder, so that it does not appear to be 'leaving the picture'.

Using different filming speeds

An invaluable property of the film medium becomes apparent when a swift-moving vehicle, person, animal or bird is slowed right down by a familiar trick of the movie camera. Here cinematography is unique—the smooth, flickerless slow-motion film sequence is poles apart from the juddering 'action replay' of televised sport.

The 24 fps speed, available on many Super 8 cameras as an alternative to 18 fps, is really only a gesture towards genuine slow motion when used in conjunction with a subsequent projection speed of 18 fps. However, it does have its uses. It adds a certain amount of dignity or deliberation or even grace to a character's movements. It is worth using in shots of trains or views through a car windscreen. More important, it reduces evidence of camera shake and, because each frame

is exposed more briefly, the image is slightly sharper. It also improves the smoothness of a zoom, a pan or a tilt.

For genuine slow motion, you need a camera that can run at something like 36 or even 54 fps. With this facility the camera operator can begin to experiment with the creative 'stretching' of time. The camera can help the study of movement in an athlete or a bird or a machine. The purpose need not be scientific. Slow motion simulates a dreamlike mood, as we all know from those interminable but undeniably captivating shots of a girl in a wispy garment cavorting about on the seashore or in the forest.

When small-scale working models of vehicles are used to represent reality, slow motion is obligatory. A miniature vehicle in motion must be filmed at a correct scale speed. This will be discussed in a later chapter.

In contrast to this, a slow running speed, such as 9 fps, has creative uses that are not generally appreciated. The one that leaps to mind, the comic speeding-up of action, seems to many film makers now to be pretty undesirable. It is based on a fallacious belief that silent comedies like those involving the Keystone Kops used fast motion, or 'undercranking', whereas the effect often shown to us can actually be blamed on the fact that films intended to be projected at a low speed are rushed through our projectors at 24 fps.

Fast motion is, however, useful in other ways. It adds excitement to an accident sequence, or to shots of leaping flames, rushing water, turbulent stormclouds or windswept cornfields. It was repeatedly used for filming the tireless crocodiles in the old Tarzan frolics. In each case it is a device to be used with discretion; a breathless chase over a hill is not necessarily more exciting when filmed with a slow-running camera—it is all too likely that it will just look ridiculous. Brief and contrasting medium and close shots, tightly cut at the editing stage, are the answer here.

It should be noted that a slow filming speed involves the probability of camera shake unless a firm tripod is used. It also



A fast-motion setting, for example 9 fps, is often used to speed up an exciting situation. Care should be taken not to make the scene merely ludicrous.

results in a 'softer' or less crisp rendering of detail in the moving subjects because each image receives a longer exposure. This again calls for a good tripod and a cable release, or better, magnetic remote control.

The longer exposure provided by slow running speeds is useful for dimly lit scenes. It is an essential component of the Super 8 XL camera system. Care should be taken that only slow-moving objects appear in these fast-motion shots.

Movement of the camera

The static subject is not the only one that calls for a mobile camera. There are many other situations in which a moving viewpoint adds greatly to the depth and realism of a sequence. But camera movement should never become too noticeable. Like many other cinematic devices—colour, titles, special effects, a musical sound track—it must never call attention to itself at the expense of the film's theme.

The obvious way of moving a camera while shooting is to hold it in the hand. The problem is to avoid camera shake. It is perfectly possible for many 'old hands' at the game of film making, such as Archie Reid, to produce entire films, sharp and crisp from start to finish, without any steadying influence except a clear head and a deep breath before shooting.

There is a trend these days toward the hand-held shot for its own sake: a trend which seems to be aiming at a positive unsteadiness 'for the sake of truth'. However, most film makers try to avoid making audiences queasy—and hence the sound advice to find a leaning place for your shoulder or elbows before shooting. You certainly cannot be expected to carry a tripod everywhere, especially when the aim is to be unobtrusive; and there are various well-known aids to camera steadiness, such as the monopod, the car-pod, the shoulder or chest support, or the looped piece of string fixed to the camera base and held under your foot. However, for many purposes, especially including ultra-close shots, filming at long-focus settings, animation of all kinds, time-lapse sequences and remote control, the tripod is almost obligatory.

Purposeful camera movements may be carried out with the hand-held camera, or else with the aid of a tripod fitted with a smoothly working pan-and-tilt head and a rising centre column.

The most favoured camera movement is probably the panoramic shot or pan, and the fact that nearly every beginner overuses it and abuses it to the point of nausea should not obscure the fact that, properly used, it is a most effective procedure. Panning enables the viewer to relate a character to his environment or to other characters, in a way that may otherwise be possible only with an extreme long shot. An obvious example is where a sinister individual is lurking at a corner, in wait for the unsuspecting girl about to cross from the other side of the street. A slow pan from one to the other gives the audience knowledge not possessed by the heroine, and this provides suspense.

The vertical camera movement, or tilt, also has the function of gradually revealing visual information. You could be watching a girl waiting outside a building, and a tilt shot could eventually show a watcher or sniper at an upper window, looking down at her.

Sooner or later the film maker will wish to move the camera more radically while shooting, so that it leaves its base altogether, either to follow a moving character or to take up a fresh position. These tracking shots are desirable in certain circumstances, and must be carried out as smoothly as possible.

It might be deemed necessary for the camera to move forward into the scene, to provide detail or to eliminate irrelevant surroundings of the main subjects, or perhaps to concentrate the viewer's attention on one individual making his way through a crowd. A backward movement effectively allows space for subsequent action, or brings in additional factors pertinent to the story. A 'crab' or sideways travelling movement brings the viewers gently round to a more advantageous viewpoint, perhaps also introducing a significant foreground element, with a pleasing three dimensional change of perspective and proportions. A 'crane' shot can be the most satisfactory way of bringing the whole setting into view, as devotees of *High Noon* well know. The mechanics involved in devising the necessary hoisting apparatus will have to be left to the ingenuity of the individual.

A sort of camera tracking excursion can form a highly effective internal montage shot, perhaps at the start of a sequence, with the viewer exploring facets of the filmed environment in a very personal and pleasing way. The shot must of course be carefully planned and meticulously rehearsed. Various dolly devices, ranging from an old pram to a home-made trolley, can be used, but many lone workers will decide on the hand-held camera and their own feet for transport. In the latter case, it is desirable to cultivate what Lenny Lipton calls a 'gliding shuffle'.

The favourite dolly is a car, which can be used in innumer-

able ways. The camera operator could be seated on the roof rack (if practicable), or crouched in the open boot or trunk at the rear (perhaps with the car moving in reverse), or hanging out of a window with camera aimed at a front wheel or at a wing mirror. The car can be part of the shot, or alternatively may be only a means to an end, a smooth and slow-moving substitute for a custom-made dolly.

Some kind of camera support will help to minimize jolts and if shots are to be taken from the car's interior, it is as well to use 24 fps and short focus with 8 mm filming. The aperture could be fixed at a good predetermined average setting, to prevent lighting fluctuation caused by the meter's delayed reaction to trees and buildings flashing past.

Tracking or travelling shots from boats, trains, elevators, even bicycles, are often most effective. Some of the most pleasing of all are those taken from chairlifts or cablecars; there is something special about these, owing to the smoothness



Shooting from a chairlift is nearly always a success, especially when it is not too far above the ground. Movement is smooth, and the scene is usually highly attractive.

of the travel, and also to the fact that the ground is not too far away and probably colourful and pleasing.

Most film makers are aware that physical tracking into a scene gives a rather different effect from increasing the focal length, or zooming, while shooting. Tracking alters perspective in the same way as is evident when you walk toward a subject; zooming in merely magnifies without changing relative proportions at all—an effect unique to the camera. Thus zooming should be used only when it is likely that audiences would accept it as a structural device appropriate to the theme.

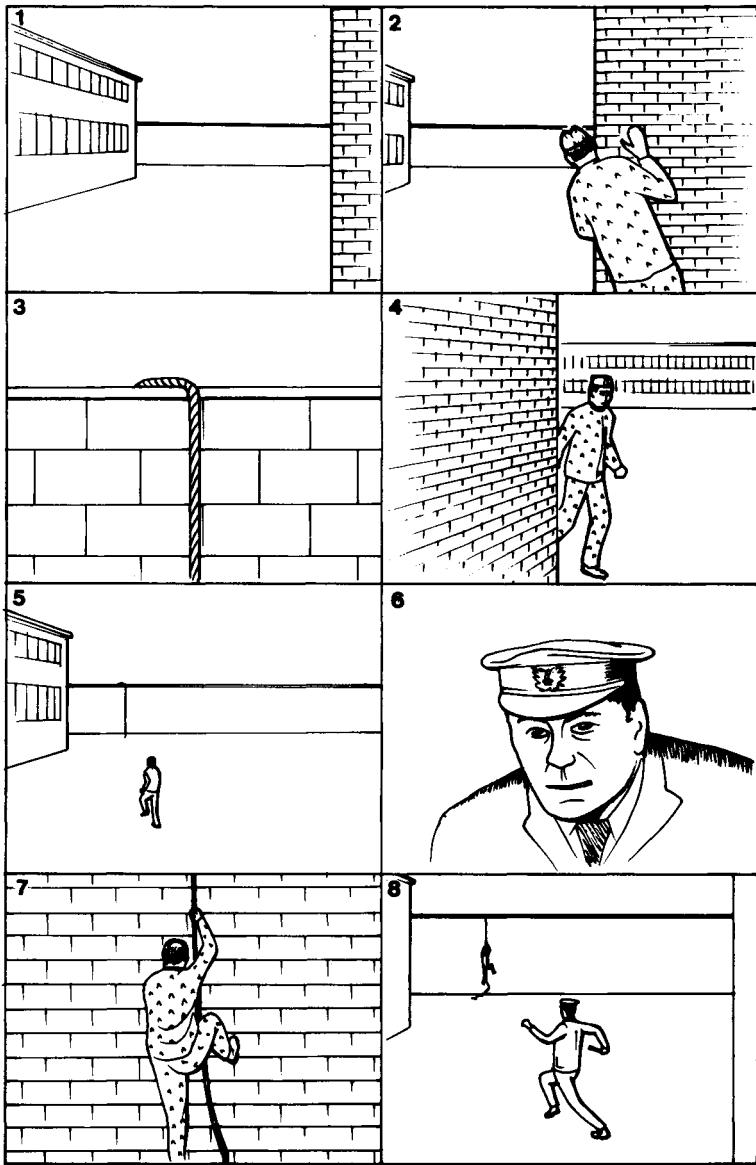
Zooming has many special uses which can be discovered by experiment. A moving vehicle or athlete can be retained in full view by hand manipulation of the zoom control. In a thriller, a man is perhaps staggering toward the camera: zooming out keeps the man occupying the same proportion of the frame, while the corridor along which he is moving changes its relationship to him in a slightly unreal way.

Zooming can be swift, giving a really startling close-up 'shock'. Generally speaking, however, it should be slow. Artistic zooming can be so slow as to be imperceptible, giving a very gradual change of emphasis. The emotionally involved heroine is in medium shot; the manual zoom brings us creeping in toward her, and the limited depth of field at the eventual telephoto end puts the irrelevant background out of focus. Here the zoom lens has another advantage over a comparable tracking shot; the final telephoto close-up happens to give the best rendering of facial characteristics.

The creative subtlety of zooming, in short, involves exploiting to the full the distinctive properties of long and short focal lengths.

When to edit

The editing of a film starts when you begin to write a script, continues throughout the shooting, and ends when you finally switch off the projector after your final viewing of the edited



This storyboard is part of the kind of sequence which demands prior planning at the scripting stage. However, alterations in detail or in order can be made later—during filming, or even during the final bench edit.

film. Consciously or unconsciously, you are editing all the time.

When during scripting you decide what type of shot should logically follow the close-up of the gravestone, you are editing. When, as you peer through the viewfinder, you decide that it would be an improvement to bring in at this juncture a shot of the escaping convict's hands slipping off the top of the wall, you are editing. And when you take the scissors and cut at mid-point the long shot of the fugitive running down the lane, so that you can splice in a shot of the dazed warder in the prison yard scrambling to his feet, you are certainly editing.

The aim of most films (admittedly not all) is to relate some kind of story as lucidly as possible. To achieve this with sufficient coherence, you have to make a whole series of decisions during the film making process concerning how you are to relate each shot to the ones preceding it and succeeding it. At what point in the project these decisions are to be made depends entirely on the methods of the individual film maker.

There are many who plan every shot in full detail in advance on paper, perhaps using the storyboard method of illustrating each shot, so that no doubts exist at the shooting stage. Some take a large number of relevant shots, out of which later on the editing table a coherent sequence will be selected and fitted together.

Other film makers favour the idea of editing in camera—of filming an event, either planned or spontaneous, in such a way that an absolute minimum of physical cutting is necessary. There are examples of complete and perfectly coherent films, on original stock, without a single splice from start to finish. This constitutes a challenge and a discipline, but is by no means an impossible task. There are certain prerequisites to this kind of film, including a limited area of action and a straight-forward storyline.

However, in the great majority of cases a certain amount of cutting and rearranging has to take place, invariably to the benefit of the film. My own holiday films are edited in camera as much as possible. I avoid jump cuts and link my shots into

sequences as I go along, simply because it is no more difficult than haphazard shooting, and very much more interesting—as well as reducing work at the editing table later. But any of my ventures into fiction have to be scripted, with shots taken according to convenience of location and availability of personnel.

It is not surprising that the actual viewing/cutting/splicing process is very much simpler with a tightly scripted fiction film than with a film composed of a large quantity of more or less relevant shots. With the former it is merely a case of cutting the rushes into shots, or into sets of shots that happened to be filmed in their final order. These lengths of film are hung up or coiled in the usual fashion and then, one by one, spliced together according to the script.

It is a different matter with the kind of film which is shot more or less haphazardly. In this case first the material can be spliced on to one reel as a rough cut for convenience, and then a numbered editing script can be written out. The actual editing consists of making and noting down dozens of decisions, based on this script, about the rearranging of shots and sequences. The film is now cut up and then spliced together according to the order indicated in the notes.

Cement or tape

The physical process of splicing can become a matter of earnest controversy among film makers. Until recently, cement was king, and the user of tape would be regarded in club circles almost as a *persona non grata* among his colleagues—experienced workers whose loyalty to the excellent bevel cement splicing method was generally unbounded.

There are now signs of a distinct and widespread change of heart. The strength, transparency and durability of the new splicing tapes, and the meticulous accuracy of some of the new splicers, have been such that many film makers (including the two who collaborated in producing this book) have finally, after much heartsearching, given up cement splicing and