5

The Shot: Cinematography

In controlling mise-en-scene, the filmmaker stages an event to be filmed. But what happens in front of the camera isn't the whole story. That event has to be captured, on a strip of film or in a digital format. The recording process opens up a new area of choice and control: cinematography.

Even if you're casually shooting a bit of video, you're making decisions about cinematography. (You might be letting the camera's automatic settings make some of them for you, but that's a decision too.) You're choosing the photographic qualities of the shot, such as exposure and frame rate. You're also choosing how to frame the shot, and whether to move the camera. And you're deciding how long the shot should run. These areas of choice are the same ones that filmmakers consider carefully. Just as nothing could be left to chance in lighting a shot like the one from *Inglourious Basterds* (4.1), so all the filmmaker's decisions about camerawork are shaped by a single concern: How will this creative choice affect the viewer?

The Photographic Image

Cinematography (literally, "writing in movement") depends to a large extent on *photography* ("writing in light"). Some filmmakers, working with 16mm or 35mm stock, have abandoned the camera to work directly on the material itself. But even the filmmaker who draws, paints, or scratches on film is creating patterns of light on celluloid. Most often, the filmmaker uses a camera to regulate how light from some object will be registered on the medium—sensitized photographic film or a video camera's computer chip. In either case, the filmmaker can select the range of tonalities, manipulate the speed of motion, and transform perspective.

The Range of Tonalities

You've probably noticed that it's rather hard to take a picture of a person lit by a sunny window. If Aunt Grace is well exposed, her garden outside the window is too bright. (The technical jargon is "blown-out.") If you expose for the garden, Aunt Grace falls into shadow. This disparity is only one example of a broader area of choice in cinematography: the control of the image's range of tones and shades. Tonality is a matter of considering how the light registers on the film. Lighting, as we've seen, is a factor in mise-en-scene, but it's intimately connected with cinematography too. In production the cinematographer is almost always the person who arranges the lighting, so he or she is in the best position to control a shot's tonality.

Contrast Let's start with one area of tonal control, the degree of contrast. **Contrast** refers to the comparative difference between the darkest and lightest

> " Both [cinematographer] Floyd [Crosby] and I wanted [*High Noon*] to look like a documentary, or a newsreel from the period of the 1880s, if film had existed at that time—which, of course, it did not. I believe that we came close to our goal by using flat lighting, a grainy texture in the printing and an unfiltered white sky."
>
> —Fred Zinnemann, director

areas of the frame. As we saw in Chapter 4, our eyes are highly sensitive to differences of color, shape, texture, and other aspects of a picture. Contrasts in the image help filmmakers to guide the viewer's eye to important parts of the frame and to give the shot an emotionally expressive quality—somber, cheerful, or whatever.

Most professional cinematography strives for a middle range of contrast: pure blacks, pure whites, and a large range in between, either grays (in black-and-white filming) or hues (in color filming). A higher-contrast image displays bright white highlights, stark black areas, and a narrow range of shades in between. A low-contrast image displays many intermediate grays or color shades with no true white or black areas **(5.1–5.6).** High-contrast images can seem stark and dramatic, whereas low-contrast ones suggest more muted emotional states.
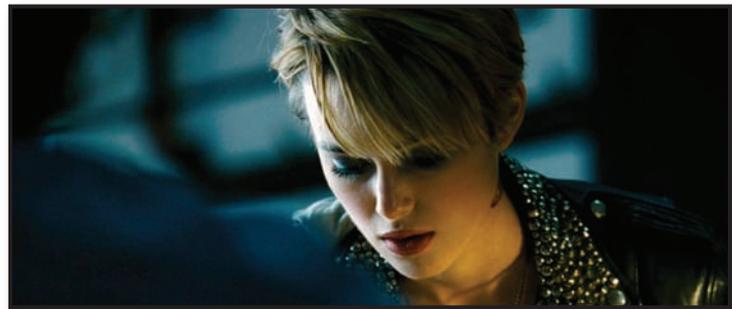
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5.1–5.6 Tonal contrast in black-and-white and color. Most black-and-white films employ a balance of grays, blacks, and whites, as in this shot from *Casablanca* (5.1). The dream sequence early in Ingmar Bergman's *Wild Strawberries* relies on high-contrast imagery, with almost no grays (5.2). Many shots in Michelangelo Antonioni's *Red Desert* have unusually low contrast, enhanced by the flat lighting and limited palette in the color design (5.3). Some contemporary films emphasize deep, rich blacks and push toward a high-contrast look, as in *Domino* (5.4). You can see the different degrees of contrast more clearly if we drain the color out of the original shots (5.5, 5.6).

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5.7–5.9 Color film and tonal range. Technicolor became famous for its sharp, saturated hues, as seen in the trolley scene of *Meet Me in St. Louis* (5.7). Soviet filmmakers used a domestically made stock that tended to lower contrast and give the image a murky greenish-blue cast. Andrei Tarkovsky stressed these qualities in the monochromatic color design of his shadowy *Stalker* (5.8). Len Lye's abstract *Rainbow Dance* exploited the English stock Gasparcolor to create pure, saturated silhouettes that split and recombine (5.9).

Many factors are used to control contrast, including lighting, filters, choice of film stock, laboratory processing, and postproduction work. Historically, photochemical filmmaking relied on photographic stocks with various degrees of sensitivity to light. Some black-and-white films gathered more light than others, and so were suited for filming news events in actual conditions. Others gave a richer, wider contrast range, and these were used for most of the studio films of the 1920s through the 1960s, where lighting could be controlled exactly. Similarly, by picking different color film stocks, cinematographers could vary the image's color contrast **(5.7–5.9).**

Exposure　A crucial way to alter the tonalities in the image is through **exposure.** Exposure regulates how much light passes through the camera lens. Often we notice exposure only when an image seems too dark (underexposed) or too bright (overexposed). We expect that filmmakers will try for a balanced exposure. Sometimes, though, that's difficult to achieve and trade-offs must be made. Filmmakers constantly face the choice between the blown-out window and the silhouetted Aunt Grace in our amateur snapshot **(5.10, 5.11).**

Sometimes a filmmaker wants unbalanced exposure. American film noir cinematography of the 1940s underexposed shadowy regions of the image in keeping

Why is *Who's Afraid of Virginia Woolf?* in black and white? "The words. The dialogue would have played differently in color."
—Ernest Lehman, screenwriter

5.10

5.11

5.10–5.11 Exposure levels. For *Kasba*, Indian director Kumar Shahani decided to expose for the shop interior in one scene and let the countryside behind blow out (5.10). In another scene he exposed for the background and created silhouetted window frames (5.11). The first shot displays the vibrant colors of the shop's wares, while the second emphasizes the difference between the market activities outside and the mysterious interior.

5.12

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5.12–5.13 Overexposure. In *Vidas Secas,* Nelson Pereira dos Santos overexposes the windows of the prison cell to sharpen the contrast between the prisoner's confinement and the world of freedom outside (5.12). *The Lord of the Rings: The Fellowship of the Ring* used digital grading to simulate photographic overexposure in the Moria sequence. In 5.13 the overexposure of the wizard's staff makes the Fellowship a bright island threatened by countless orcs in the darkness.

> 66 "[In digital cinematography] you start seeing lines on people's faces that aren't really there. I find myself using diffusion filters that I haven't used in 20 years just to be kinder to the faces of the people I'm photographing."
> —Stuart Dryburgh, cinematographer

with low-key lighting techniques. Likewise, overexposure can create expressive effects **(5.12).** In addition, images shot with correct exposure can be overexposed or underexposed in developing, printing, or digital postproduction **(5.13).**

Exposure can be affected by **filters**—slices of glass or gelatin put in front of the lens of the camera or printer to reduce certain frequencies of light reaching the film. Filters can alter the range of tonalities in radical ways. Hollywood cinematographers since the 1920s have sought to add glamour to close-ups, especially of women, by means of diffusion filters, along with gels or silks placed over light sources **(5.14).** Before modern improvements in film stocks and lighting made it practical to shoot most outdoor night scenes at night, filmmakers routinely made such scenes by using blue filters in sunlight—a technique called *day for night* **(5.15).**

Changing Tonality after Filming Filmmakers have often manipulated the image's tonalities after filming. For instance, films could be printed on stocks that yielded different tonal values. Avant-garde directors have explored unusual ways of altering images after they came from the camera **(5.16, 5.17).**


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5.14–5.15 Filters alter tonality. Studio films like *A Farewell to Arms* often employed diffusion filters, along with soft and high-key lighting, to create romantic images of women (5.14). For *The Searchers,* this scene of the protagonists spying on an Indian camp at night was shot in sunlight using day-for-night filters (5.15).

One of the most common adjustments in the silent-film era involved adding color to black-and-white images through tinting and toning. *Tinting* is accomplished by dipping the already developed film into a bath of dye. The dark areas remain black and gray, while the lighter areas pick up the color **(5.18)**. *Toning* worked in an opposite fashion. The dye was added during the developing of the positive print. As a result, darker areas are colored, while the lighter portions of the frame remain white or only faintly colored **(5.19)**. More ambitious and rare was hand-coloring, which filled certain parts of the shot with an appropriate color **(5.20)**. Later film-makers occasionally revived silent-film processes **(5.21).**

Many more adjustments of the image's tonality can be made in postproduction. For photochemically based filmmaking, the role of *grader* or *timer* was created to alter the color range of a print. The rise of digital filmmaking supplied even more tools to the expert now called the *colorist*. Once the film exists as a set of files, the adjustments can be very precise. For example, with analog color grading, any
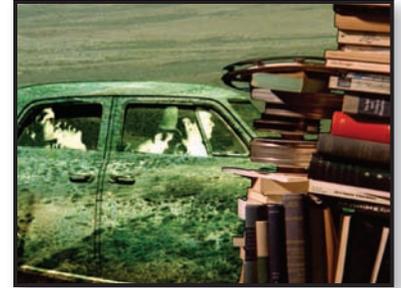
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5.16–5.17 Experimental manipulation after filming. Throughout *Power and Water*, Pat O'Neill creates spectacular imagery by use of optical printing, matte work, and other special effects (5.16). By scratching the emulsion, Stan Brakhage emphasizes the eye motif that runs through *Reflections on Black* (5.17).

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5.18–5.21 Adding color to black and white. Tinting creates a brownish color across the entire frame in the 1914 film *The Wrath of the Gods* (5.18). The color suggests the heat of an erupting volcano. In *Cenere* ("Ashes," 1916) the deep blue of the dark areas and the nearly white patches are characteristic of toning (5.19). Night scenes like this were often colored blue. Firelight was frequently red, while interiors were commonly amber. Hand-colorists used stencils laid over each frame to create vibrant imagery, as in Albert Capellani's 1906 *Aladdin, or the Wonderful Lamp* (5.20). For her experimental film *Daisies,* Vera Chytilová employs a crimson toning (5.21).

5.22 Selective digital grading. In this close-up from *The Lord of the Rings: The Fellowship of the Ring,* the oval on the actor's face indicates the area within which the colorist wants to change the lighting or the color.

> **66** I have a hard enough time making up my mind about things without going into a DI suite; I don't think I'd ever get out of there. The process creates too many options."
>
> —Paul Thomas Anderson, director, *There Will Be Blood*

change made to a shot affected the entire frame area. But digital programs allow the colorist to target specific parts of the frame **(5.22)** and maintain that adjustment even if the parts shift during the shot. Today, some cinematographers bring a colorist to the set to make decisions during shooting.

Likewise, to get a day-for-night effect, the scene will be darkened in postproduction. For the climactic night sequence in *Winter's Bone,* two women take the heroine to a pond. Some shots were taken in bright daylight, others were taken at dusk, and the close views of the women in the boat were shot at night, with lamps providing dim illumination. Through digital grading, all the shots were blended into a uniformly dark sequence. *Julie & Julia,* a romantic comedy, used the opposite technique, adding sunlight to scenes that had been shot on overcast days.

Digital postproduction has reshaped every area of technique, from mise-en-scene and cinematography to editing and sound. (See "A Closer Look," pp. 165–166.) With more opportunities, however, come more forced decisions. One editor wonders whether digital postproduction offers too many alternatives: "I still generally feel, if you don't have it [in shooting], it wasn't meant to be. You can't manipulate everything like that or we might as well all be in animation."

Speed of Motion

A gymnast's performance seen in slow motion, ordinary action accelerated to comic speed, a tennis serve stopped in a freeze-frame—our films and videos are full of such effects. We don't often reflect on the fact that they depend on a photographic power unique to cinema: control over the speed of movement seen on the screen.

The speed of the motion presented onscreen depends on two factors: the rate at which the film was shot and the rate of projection. Both **rates** are calculated in frames per second. The standard rate for film-based shooting, established when synchronized-sound movies came in at the end of the 1920s, was 24 frames per second (fps). Today's 35mm cameras commonly offer the filmmaker a choice of anything between 8 and 64 fps, with specialized cameras offering a wider range of choice. Professional HD cameras, typically standardized at around 24, 25, and 30 fps, offer a comparable menu of frame rates.

If the movement is to look accurate on the screen, the rate of shooting should correspond to the rate of projection. This is what normally happens with modern films. The main problem comes with silent films, which are sometimes shown speeded up from their original frame rates. Before the filming rate was standardized at 24 fps, films were taken at anywhere from 16 to 22 fps, and so they look jerky when screened at 24 fps. Projected at the correct speed, silent films look as smooth as movies made today.

As the silent films show, if a film is exposed at fewer frames per second than the projection rate (say, 16 or 18 frames), the screen action will look speeded up. This is the *fast-motion* effect sometimes seen in comedies. But fast motion has long been used for other purposes. In F. W. Murnau's *Nosferatu,* the vampire's coach rushes skittishly across the landscape, suggesting his supernatural power. In

A CLOSER LOOK

FROM MONSTERS TO THE MUNDANE
Computer-Generated Imagery in The Lord of the Rings

The films adapted from J. R. R. Tolkien's trilogy *The Lord of the Rings* (*The Fellowship of the Ring, The Two Towers,* and *The Return of the King*) show how computer-generated imagery (CGI) can be used for huge battle scenes, plausible monsters, and magical events. The films also illustrate how CGI shapes less spectacular, more mundane areas of production.

CGI was used at every stage of production. In pre-production, a sort of animated storyboard (a *previs,* for "previsualization") was made, consisting of *animatics,* or rough, computer-generated versions of the scenes. Each installment's previs was about as long as the finished film and coordinated the work of the huge staff involved in both digital and physical tasks.

During production of the three films, CGI helped create the mise-en-scene. Many shots digitally stitched together disparate elements, blending full-size settings, miniature sets, and matte paintings (see 5.60). A total of 68 miniature sets were built, and computer manipulation was required in each case to make them appear real or to allow camera movements through them. Computer paint programs could generate matte paintings for the sky, clouds, distant cliffs, and forests that appeared behind the miniatures.

Rings also drew on the rapidly developing capacity of CGI to create characters. The war scenes were staged with a small number of actual actors in costumes, but CGI added vast crowds of soldiers alongside them. As happens often nowadays, the *Rings* project demanded new software programs. A crucial program was Massive (for "Multiple Agent Simulation System in Virtual Environment"). Using motion-capture on a few *agents* (costumed actors), the team could build a number of different military maneuvers, assigning all of them to the thousands of crude, digitally generated figures. By giving each figure a rudimentary artificial intelligence—such as the ability to see an approaching soldier and identify it as friend or foe—Massive could generate a scene in which figures scattered or gathered in unpredictable ways **(5.23).**

The monsters encountered by the characters during their quest were more elaborately designed than the troops. A detailed three-dimensional model of each creature was captured with a scanning wand that could read into recesses and folds. A new software system, Character Mapper, captured motion from an actor and then adjusted body mass and muscles to imaginary skeletons. In the cave-troll sequence, the large, squat creature swings its limbs and flexes its muscles in a believable fashion.

The skeletal Gollum was created with a combination of motion-capture and CGI, but human actors didn't escape the CGI process. The main characters were given digital look-alikes who replaced stunt doubles, executing dangerous or difficult movements. The story demanded that full-size actors play three-feet-tall hobbits who interact with characters considerably taller than them. The size difference was often created during filming by using small doubles or by placing the hobbits farther from the camera in false-perspective sets.

Cinematography also depended on CGI. For the cave-troll scene, director Peter Jackson donned a virtual-reality helmet and planned camera positions by moving around a virtual set and facing a virtual troll. The camera positions were motion-captured and reproduced in the actual filming of the sequence—which has a rough, handheld style quite different from the rest of the scenes.

In postproduction, animators erased telephone poles in location shots and helicopter blades dipping into the aerial shots of the Fellowship's voyage across mountains. Specialized programs added details, such as the ripples in the water in the Mirror of Galadriel.

Perhaps most important, digital grading altered the color of shots, giving each major location a distinctive look. Rivendell's scenes are in autumnal tones, while the early scenes in the Shire were given a yellow glow that enhanced the sunshine and green fields. The grading also utilized an innovative program that permitted adjusting the color values of individual elements within a shot. When Galadriel shows Frodo her mirror, she glows bright white, contrasting with the deep blue tones of Frodo's figure and setting **(5.24).** Thanks to digital grading, CGI techniques can do more than create crowds and creatures: They can shape the visual style of an entire film.

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5.23–5.24 Mise-en-scene and cinematography controlled by digital postproduction. Vast crowds of soldiers with individualized movements were generated by the Massive software program for *The Two Towers* (5.23). In *The Fellowship of the Ring,* selective digital color grading makes one figure bright white while the rest of the scene has a muted tone (5.24).

Godfrey Reggio's *Koyaanisqatsi,* delirious fast motion renders the hectic rhythms of urban life **(5.25).** More recent films have used fast motion to grab our attention and accelerate the pace, whisking us through a setting to the heart of the action.

The more frames per second shot (say, 48 or 64), the slower the screen action will appear. The resulting *slow-motion* effect is used notably in Dziga Vertov's *Man with a Movie Camera* to render sports events in detail, a function that continues to be

important today. The technique can also be used for expressive purposes. In Rouben Mamoulian's *Love Me Tonight,* the members of a hunt decide to ride quietly home to avoid waking the sleeping deer; their ride is filmed in slow motion to create a comic depiction of noiseless movement.

Today slow-motion footage often functions to suggest that the action takes place in a dream or fantasy. It can also be used to convey enormous power, as in a martial-arts or superhero film. Slow motion is also used for emphasis, becoming a way of dwelling on a moment of spectacle or high drama. Slow-motion scenes of a couple walking add a lyrical rhythm to Wong Kar-wai's *In the Mood for Love,* suggesting that they are unwittingly dancing with each other.

5.25 Fast motion. Cars become blurs of light in *Koyaanisqatsi.*

To enhance expressive effects, filmmakers can change the speed of motion during a shot. Often the change of speed helps create special effects. In *Die Hard* a fireball bursts up an elevator shaft toward the camera. During the filming, the fire at the bottom of the shaft was filmed at 100 fps, slowing down its progress, and then shot at faster speeds as it erupted upward, giving the impression of an accelerating explosion.

The *Die Hard* sequence creates a realistic-looking explosion, but sometimes filmmakers choose to call our attention to changes in the speed of capturing the action. Varying the frame rate during shooting is called **ramping.** Since ramping alters exposure, lighting levels on the set have to be coordinated with the frame rate. For the fight scenes in *Sherlock Holmes,* the Phantom, a specialized digital camera used to create slow motion, was ramped from 24 fps to 800 fps and then back to 24 fps. During the passage of slow motion, a burst of light kept the exposure constant.

Ramping is sometimes used as a one-off effect to emphasize a bit of action, as in the *Die Hard* and *Sherlock Holmes* scenes. But it can also function as a motif and create parallels. In an early scene of Michael Mann's *The Insider,* researcher Jeffrey Wigand leaves the tobacco company that has just fired him. As he crosses the lobby toward a revolving door, his brisk walk suddenly slows to a dreamlike drifting. The point of this striking stylistic choice becomes apparent only in the film's last shot. Lowell Bergman, the TV producer who has helped Wigand reveal that addictive substances are added to cigarettes, has been dismissed from CBS. Bergman strides across the lobby, and as he passes through the revolving door, his movement glides into extreme slow motion. The repetition of the technique compares two men who have lost their livelihoods as a result of telling the truth: two insiders who have become outsiders.

There are more extreme forms of fast and slow motion. *Time-lapse* cinematography permits us to see the sun set in seconds or a flower sprout, bud, and bloom in a minute. For this, a very low shooting speed is required—perhaps one frame per minute, hour, or even day. For *high-speed* cinematography, such as recording a bullet shattering glass, the camera may expose hundreds or thousands of frames per second. Most cameras can be used for time-lapse shooting, but high-speed cinematography requires specially designed cameras.

After filming, the filmmaker can still control the speed of movement on the screen. Until the early 1990s, the most common tool for this was the optical printer. This device rephotographs a film, copying all or part of each original frame onto another reel of film. The optical printer can reverse the action, accelerate it by skipping frames, slow the action by reprinting frames (*stretch printing*), or freeze the action by printing the same frame over and over. Today digital postproduction permits the same manipulations that were pioneered on the optical printer.

Many experimental films have played with the possibilities of altering the speed of original footage. With the help of an optical printer, Ken Jacobs's *Tom Tom the Piper's Son* (12.11) explores the images of an early silent film by pausing the shots and enlarging portions of them. More mainstream films have also exploited the freeze-frame effect. It can underscore a piece of action or a line of dialogue,
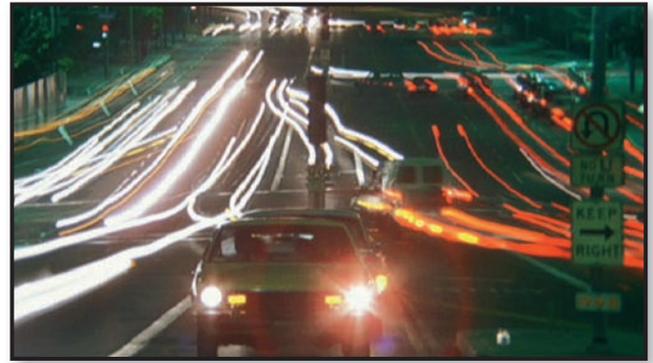
5.26 Freeze-frame for a closing shot. In *A Moment of Innocence,* the final freeze-frame lets us contemplate what the gestures imply about the young men's attitudes toward the woman. Another example of an irresolute final freeze-frame is 3.10.

or suggest a character's memory. At the end of the film a freeze-frame can linger on a situation, imprinting it on the viewer's mind. It can also suggest that the story action hasn't quite resolved **(5.26).**

Perspective

You are standing on railroad tracks, looking toward the horizon. The tracks seem to meet in the distance, and the track ties get steadily smaller as they recede. Yet you know that the tracks are really parallel, and the ties are of uniform size. What is happening?

Your eye gathers light reflected from the scene and creates an image of space and the things in it. The objects in the scene have some regular relation to one another. The tracks converge and the ties get smaller. Your vision, in other words, shows a *perspective* view of the scene: a set of spatial relations organized around a viewing point.

The **lens** of a photographic camera does roughly what your eye does. Located at a specific point, it gathers light from the scene and transmits that light onto the flat surface of the film or video chip to form an image that represents size, depth, and other dimensions of the scene. So a camera lens also creates a perspective image.

One difference between the eye and the camera, though, is that photographic lenses may be changed, and each type of lens will render perspective in different ways. If two different lenses photograph the same scene, the perspective relations in the resulting images can be drastically different. As we'll see, a wide-angle lens could exaggerate the depth you see down the track or could make the foreground trees and buildings seem to bulge. A telephoto lens could drastically reduce the depth, making the trees seem very close together and nearly the same size.

The Lens: Focal Length   Filmmakers think carefully about the perspective of an image. The main area of choice involves the **focal length** of the lens. In technical terms, the focal length is the distance from the center of the lens to the point where light rays converge to a point of focus on the film. The focal length alters the size and proportions of the things we see, as well as how much depth we perceive in the image.

We can distinguish three general sorts of lenses, based on their focal lengths and the ways they present perspective. We'll use 35mm film as our reference point, although the three types of lenses hold good for digital formats as well.

1. *The short-focal-length* (wide-angle) *lens*

In 35mm-gauge cinematography, a lens of less than 35mm in focal length is considered a wide-angle lens. It's called that because it takes in a relatively wide field of view. But in capturing the wider field, these lenses tend to distort straight lines lying near the edges of the frame, bulging them outward **(5.27–5.29).** Less obviously, a short focal-length lens exaggerates depth, making figures in the foreground seem bigger and those in the distance seem farther away **(5.30).** As a result, when figures move toward or away from the camera, a wide-angle lens makes them seem to cover ground more rapidly.

2. *The middle-focal-length* (normal) *lens*

A common length for a medium, or normal lens, in 35mm and high-end digital cinematography, is 50mm **(5.31).** This lens seeks to avoid noticeable perspective distortion. With a medium lens, horizontal and vertical lines are rendered as straight and perpendicular. (Compare the bulging effect of the wide-angle lens.) Parallel lines should recede to distant vanishing points, as in our railroad tracks example. Foreground and background should seem neither stretched apart (as with the wide-angle lens) nor squashed together (as with the telephoto lens).

> ❝I'm standing around waiting to see where the 50mm is going to be, or what size lens they're putting on, and in that unwritten book in my brain, I said, 'Don't ever let them shoot you full face, on a wide-angle lens, you'll end up looking like Dumbo.'❞
> —Tony Curtis, actor

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5.30

5.27–5.30 Wide angle and perspective. In *Don't Look Now,* as the camera swivels to follow John Baxter, the wide-angle lens makes a street lamp he passes appear to lean to the right (5.27), and then to the left (5.28). Wide-angle close shots risk distortion, as with the young woman's hand in Mikhail Kalatozov's *The Cranes Are Flying* (5.29). In *The Little Foxes,* the lens makes the characters seem relatively far from one another, even though they're within a small area of the parlor (5.30).

3. *The long-focal-length* (telephoto) *lens*

Wide-angle lenses stretch space along the frame edges, but longer lenses flatten the space along the camera axis. Cues for depth and volume are reduced. The planes seem squashed together, much as when you look through a telescope or binoculars **(5.32).** (For this reason, long lenses are also called telephoto lenses.) Long lenses take in a narrower angle of vision than wide-angle or normal lenses do. As you'd expect, the effect of movement with a long lens is the opposite of what happens with the wide angle. A person moving toward the camera takes more time to cover what seems to be a small distance.

Today long lenses are typically 100mm or greater in length. You'll often see them at work in televised sports events, since they magnify action at a distance. In a baseball game, there will invariably be shots taken from almost directly behind the pitcher, using a camera located beyond the centerfield wall. You've probably noticed that such shots make the umpire, catcher, batter, and pitcher look unnaturally close to one another. In other contexts, the effect of a very long lens can be otherworldly **(5.33).**

5.31 The medium focal-length lens. A shot made with a medium lens in *His Girl Friday.* Contrast the sense of distance among the actors seen in 5.30.

5.32

5.33

5.32–5.33 Long lenses and perspective. In 5.32, from Chen Kaige's *Life on a String,* the long lens squashes the crowd members almost to a single plane. It also makes the rapids behind the men virtually a two-dimensional backdrop. In *Koyaanisqatsi,* an airport is filmed from a great distance, and an exceptionally long focal length makes the plane seem to land on a highway (5.33).

"In *New York, New York*, we shot only with a 32mm lens, the whole movie. We tried to equate the old style of framing, the old style meaning 1946–53."
—Martin Scorsese, director

"I tend to rely on only two kinds of lenses to compose my frames: very wide angle and extreme telephoto. I use the wide angle because when I want to see something, I want to see it completely, with the most detail possible. As for the telephoto, I use it for close-ups because I find it creates a real 'encounter' with the actor. If you shoot someone's face with a 200-millimeter lens, the audience will feel like the actor is really standing in front of them. It gives presence to the shot. So I like extremes. Anything in between is of no interest to me."
—John Woo, director, *A Better Tomorrow* and *Hard Boiled*

Lens length can distinctly affect the spectator's experience. For example, expressive qualities can be suggested by lenses that distort objects or characters. A decision about lens length can make a character or object blend into the setting **(5.34–5.36)** or stand out in sharp relief **(5.37).** Filmmakers may exploit the flattening effects of the long focal-length lens to create solid masses of space as in an abstract painting **(5.38).** A director can use the distortions of lens lengths for surprise effects as well **(5.39, 5.40).**

In taking snapshots you've probably used a **zoom lens** to enlarge some part of a shot. The lens changes framing, but it also changes focal length. So the zoom not only resizes what's shown; it also changes the image's perspective. With its variable focal length, the zoom combines the wide-angle, medium, and telephoto options we've already looked at.

Fixed focal-length lenses can't change perspective relations while the camera is running, but the zoom can. Zoom lenses were originally used for documentary shooting. Most filmmakers didn't try to zoom during filming, because they worried that the rapid warping or flattening of the image would be distracting. But in the late 1950s, filmmakers began zooming while shooting.

Since then, the zoom has sometimes been used to substitute for moving the camera forward or backward. During a zoom, the camera remains stationary, while the zoom shot magnifies or demagnifies the objects filmed **(5.41–5.43).** It can also create intriguing deformations of depth and scale, as we'll see when we examine *Wavelength.*

If you're not yet convinced that the choice of focal length matters, consider Ernie Gehr's abstract experimental film *Serene Velocity.* The scene is an empty corridor. Gehr shot the setting with a zoom lens, but in a very unusual way.

[I] divided the mm range of the zoom lens in half and starting from the middle I recorded changes in mm positions. . . . The camera was not moved at all. The zoom lens was not moved during recording either. Each frame was recorded individually as a still. Four frames to each position. To give an example: I shot the first four frames at 50mm. The next four frames I shot at 55mm. And then, for a certain

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5.34–5.36 Long lenses and movement. In *Tootsie*, Dorothy becomes visible among the crowd at a considerable distance from the camera (5.34). After taking 20 steps, "she" seems only slightly closer (5.35). Finally, after taking 36 steps, Dorothy seems somewhat closer (5.36). The shot is held long enough for us to absorb Michael's makeover and to recognize that the masquerade is successful: He can merge into the crowd.
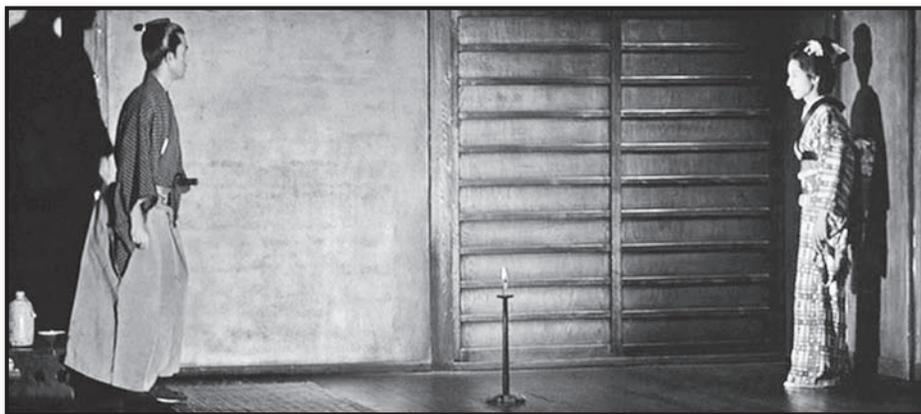
5.37

5.38

5.37–5.38 Lens length for expressive effect. In Ilya Trauberg's *China Express,* wide-angle distortion makes the man's hand more threatening (5.37). In *Eternity and a Day,* a long lens turns the beach and sea into two vertical strips behind the character (5.38).

5.39

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5.39–5.40 Focal length for surprise and suspense. In Kurosawa's *Red Beard,* when the mad patient comes into the intern's room, a long focal-length lens makes her seem close and threatening (5.39). But a cut to a more perpendicular angle shows that they're actually several feet apart and that he is not yet in danger (5.40).

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5.41–5.43 The zoom at work. The opening of *The Conversation* presents one of the most famous zoom shots in cinema. A long, slow zoom-in arouses considerable uncertainty about its target (5.41, 5.42), until it finally centers on a mime and our protagonist, surveillance technician Harry Caul (5.43). You can see how the varied focal lengths change perspective: In 5.41, the street tapers into the distance, but at longer lengths (5.42, 5.43), the pavement's grid doesn't recede.

duration, approximately 60 feet, I went back and forth, four frames at 50mm, four frames at 55mm; four frames at 50mm, four frames at 55mm; etc. . . . for about 60 feet. Then I went to 45–60 [mm] and did the same for about 60 feet. Then to 40–65, and so on.

Onscreen, we see an image whose perspective relations pop in and out at us rhythmically—first with little difference, but gradually with greater tension between a telephoto image and a wide-angle image **(5.44).** In *Serene Velocity* Gehr engages us sheerly through formal patterning of focal lengths.

The Lens: Depth of Field and Focus   You're well aware that a photograph or a movie scene can show some things in **focus** and let other things get fuzzy. That effect is, once more, due to the lens's focal length.

Every lens has a specific **depth of field:** a range of distances within which objects can be photographed in sharp focus, given a certain exposure setting. For example, suppose you are shooting with a 50mm lens and your subject is 10 feet away. At one common exposure level, focusing the lens at 10 feet will render everything between 8½ and 12 feet away in acceptable focus. Outside that zone, either closer to the lens or farther way, objects will blur.

5.44 Formal experiment with lens length. In *Serene Velocity,* telephoto shots of a hallway are juxtaposed to wide-angle shots taken from the same spot, creating a pulsating rhythm and an abstract play of rectangular shapes.

All other things being equal, a wide-angle lens has a relatively greater depth of field than a telephoto lens. A 32mm lens focused at 10 feet yields an acceptable focal range of about 6 to 25 feet. The opening shot of *Simple Men* shows depth of field at work **(5.45).**

Depth of field isn't the same as deep space, discussed in Chapter 4. *Deep space* is a term for the way the filmmaker has staged the action on several different planes, *regardless of whether all of these planes are in focus.* In the case

5.45 Focal length in action. The opening shot of *Simple Men* focuses on the robber and the security guard in the middle ground. The yellow railing in the foreground is out of focus. In the distant background stands the female robber's partner, who is out of focus too. The lens's depth of field picked out certain zones of space in front of the camera.

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5.46–5.47 Depth of field yields selective focus. As often happens with selective focus, the main point of interest in this shot from Agnès Varda's *Vagabond* (*Sans toi ni loi*) is kept in focus, while the background is out of focus (5.46). More unusual is Léos Carax's decision in *Boy Meets Girl* to show his protagonist in the background, fascinated by the neck of the woman in the foreground (5.47).

of *Our Hospitality,* those planes usually are in sharp focus, but in other films, not every plane of deep space is in focus. In the *Simple Men* shot (5.45), we can see three planes of depth, but they aren't all in focus. Deep space is a matter of mise-en-scene, involving how the scene is arranged. Depth of field depends on the camera, with the lens determining what layers of a deep-space staging are in focus.

If depth of field controls perspective relations by determining which planes will be in focus, what choices are open to the filmmaker? He or she may opt for what is usually called *selective focus*—choosing to focus on only one plane and letting the other planes blur. As the *Simple Men* example suggests, selective focus guides the viewer's eye: We tend to pay attention to what is most clearly visible. Often this involves focusing on the main character and throwing the surroundings out of focus **(5.46).** Alternatively the director may choose to put an unexpected plane in focus and let the rest blur **(5.47).**

In Hollywood during the 1940s, partly because of the influence of *Citizen Kane,* filmmakers began using lenses of shorter focal length, along with more sensitive film stock and higher light levels, to yield a greater depth of field **(5.48).** This practice came to be called **deep focus.** Combined with deep-space staging, it became a major stylistic option in the 1940s and 1950s **(5.49).** The technique was

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5.49

5.48–5.49 The golden age of deep-focus cinematography. In the famous contract-signing scene from *Citizen Kane,* the entire depth composition is in sharp focus from one plane near the lens (Bernstein's head), through several planes in the middle ground, to the wall far in the distance (5.48). A similar example of deep-space staging combined with deep-focus cinematography is Anthony Mann's *The Tall Target* (5.49).

> ❝ If I made big-budget films, I would do what the filmmakers of twenty years ago did: use 35, 40, and 50mm [lenses] with lots of light so I could have that depth of field, because it plays upon the effect of surprise. It can give you a whole series of little tricks, little hiding places, little hooks in the image where you can hang surprises, places where they can suddenly appear, just like that, within the frame itself.❞
>
> —Benoît Jacquot, director, *A Single Girl*

On the problems of shooting in cars: "There are no new angles. They've all been done a thousand times, plus the mechanics of doing it are hideous. The camera car, the walkie-talkie, trying to keep it realistic-looking, the police motorcade that must accompany you—all of those things conspire to mar the intimacy of what you're shooting. I think they had it right in old Hollywood where they would do it in the studio with rear-screen projection."

–Alexander Payne, director of *The Descendants* and *Nebraska*

even imitated in cartoons. (See 4.146.) During the 1970s and 1980s, younger directors like Steven Spielberg and Brian De Palma revived deep-focus cinematography **(5.50).** Early HD cameras had small sensors, which kept all planes in focus **(5.51).** As larger sensors were developed, cinematographers could more easily create selective, shallow-focus images.

Selective focus automatically steers our attention to a single important part of the shot. But deep focus tends to make several areas equally visible. So the filmmaker's choice of deep focus creates another set of options for guiding our eye. Those options include sound (we tend to watch who's speaking), elements of mise-en-scene, such as lighting and staging (p. 144), and aspects of framing and composition.

Just as a zoom lens lets the filmmaker change focal length while filming, focus can be altered within a shot by **racking focus,** or *pulling focus.* This is commonly used to switch our attention between foreground and background **(5.52–5.53),** making one plane blurred and another sharp.

Special Effects The image's perspective relations can be shaped by **special effects.** The most unrealistic sort is **superimposition.** Here images are laid over one another, creating multiple perspectives within the frame. Superimpositions were originally created by double exposure either in the camera or in laboratory printing. For decades filmmakers presented dreams, visions, or memories superimposed over a character's face **(5.54).** Today, as you'd expect, superimpositions are created in digital postproduction.

Filmmakers working for American and European studios in the 1920s and 1930s devised other ways of manipulating perspective relations. Suppose you want to shoot a piece of action in the studio but persuade the viewer that it's taking place on location. The trick was to create a *composite,* in which separately photographed images are blended in a single composition.

One solution was to simply project footage of a setting onto a screen, then film actors in front of it. The whole ensemble could then be filmed from the front **(5.55).** This was called, logically enough, **rear projection** (or *process work*), and it was widely used. You'll see it in many classic Hollywood films. When people are shown inside moving vehicles, the scenery whizzes by in rear projection. To modern eyes, older forms of rear projection don't create very convincing depth cues **(5.56).**

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5.50–5.51 Deep focus in film and video. In *The Untouchables,* a conversation scene is played in the foreground while setting and distant figures are also kept in focus (5.50). This shot uses a special split-focus lens that can render extreme depth, but a comparable effect is more easily achieved in digital video, where a small chip can yield extreme depth of field. If this shot, from Agnès Varda's *The Gleaners and I,* had been made on film, either Varda's hand or the truck would have been far more out of focus (5.51).

5.52

5.53

5.52–5.53 Racking focus. In this shot from *Last Tango in Paris,* Jeanne, the bench, and the wall in the distance are in focus, while Tom in the foreground is not (5.52). After the camera racks focus, Tom becomes sharp and the background is blurred (5.53).

5.54 Superimposition. In the opening of Quentin Tarantino's *Kill Bill, Vol. 1,* the Bride sees the first victim of her revenge, and her memory of a violent struggle is superimposed over a tight framing of her eyes.

A more complicated approach to composite filming, also developed in the classical studio system, was **matte work.** A *matte* is a portion of the setting photographed on a strip of film, usually with a part of the frame empty. Through laboratory printing, the matte is joined with another strip of film containing the actors. It was common to have expert artists paint an image of the setting, and the painting was then filmed, leaving a blank space in the frame. The footage was combined with footage of action, filmed to fit the blank area. Several long shots in *The Wizard of Oz* exemplify classic matte painting (2.22).

With a matte painting, the actor can't move into the painted portions of the frame without seeming to disappear. To solve this problem, filmmakers used a *traveling matte.* Here the actor was photographed against a blank, usually blue, background. In laboratory printing, a background was prepared and a moving outline of the actor was cut out of it. Then the shot of the actor was jigsawed into the moving gap in the background footage. Traveling mattes could present persuasive images of space adventure or show cartoon characters interacting with humans **(5.57, 5.58).** Like any technique, however, traveling mattes can also generate a stylized, deliberately unrealistic image **(5.59).**

Now that filmmakers have software to do compositing, it might seem that rear projection and matte work are hopelessly outdated. But today's digital techniques
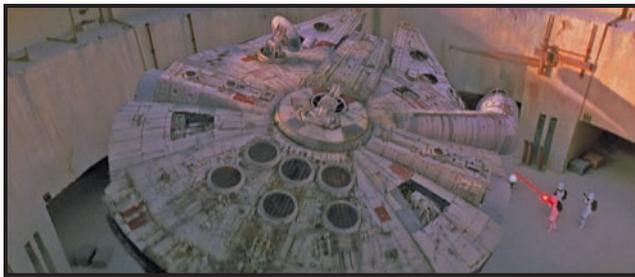
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5.55–5.56 Movies inside movies. Behind the scenes (5.55): Rear projection for *Boom Town* (1940). In Hitchcock's *Vertigo,* the seascape in the rear plane was shot separately and used as a back-projected setting for an embrace filmed under studio lighting (5.56). From the 1920s through the 1950s, rear projection was easier than taking cast and crew on location.


5.57

5.57–5.59 Traveling mattes. In *Star Wars: Episode IV—A New Hope,* the take-off of the *Millennium Falcon* was filmed as a model against a blue screen and matted into a shot of a building with imperial troopers firing upward (5.57). The animated figures in *Who Framed Roger Rabbit* were matted into live-action footage shot separately (5.58). For *Rumble Fish,* a black-and-white film, Francis Ford Coppola uses traveling mattes to color the fish in an aquarium—recalling early film's experiments with hand-coloring (5.59).

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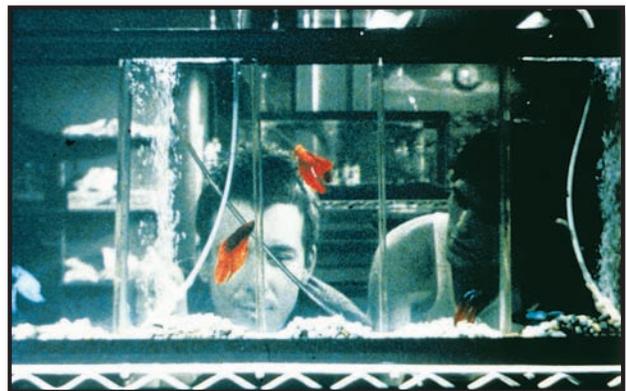
5.59

mimic the special effects created by analog cinematography and lab work. Rear projection is still used, although usually with digitally shot footage. Digital special effects still require that the action be shot in front of a screen, but now it's either blue or green. The backgrounds, often digital matte paintings, are added later, as in traditional compositing. Likewise, today's merging of several digital effects within a frame **(5.60)** resembles pre-digital practice. In *2001: A Space Odyssey, Blade*

5.60 Merging special effects. The digital composite from *The Fellowship of the Ring* integrates a partial but full-size set with an actor at the left, a miniature set in the middle ground, a matte painting of the background elements, and computer-animated waterfalls and falling leaves.

Runner, and other classic science fiction films, a single shot might include animated miniatures or models, traveling mattes to render their movements, and ray bursts added in superimposition—all against a matte-painted background.

Most filmmakers choose to present tonality, speed of motion, and perspective in realistic ways. Like other film techniques, though, photographic manipulations of the shot needn't be used for realism. For instance, most movie shots don't want to confuse you about the positions or sizes of the characters. But Chytilová's *Daisies* presents a comic optical illusion **(5.61).** Similarly, most CGI shots aim at a seamless integration that persuades us that we're seeing a realistic space. But in *The Mill & the Cross,* digital images of Brueghel's painting "The Way to Calvary" are stitched together with foreground scenes shot with actors **(5.62).** The result tricks our eye by combining painterly and filmic perspectives. Like mise-en-scene, visual perspective can be stylized, imaginative, and blatantly unrealistic if the filmmaker chooses that path. It all depends on how the stylistic choices function in the pattern of the overall film.

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CGI can create spectacle, and some critics claim that the special effects make the story unimportant. We argue the opposite and talk about a film historian who agrees in "Classical cinema lives! New evidence for old norms."

Framing

You're very aware of **framing** when you take a photo or shoot a video. You don't usually want to cut off people's heads. Like tonality, speed of motion, and perspective, framing is carefully considered by filmmakers of all sorts. It's one of the most powerful cinematographic techniques.

Framing was crucial for the first major filmmaker in history, Louis Lumière. An inventor and businessman, Lumière and his brother Auguste devised one of the first practical cinema cameras **(5.63).** The Lumière camera, the most flexible of its day, weighed only 12 pounds. This was the camera that Melies used for his cinematic trickery (p. 114), but Louis Lumière's earliest films presented simple events—workers leaving his father's factory, a game of cards, a family meal. But even at so early a stage of film history, Lumière was able to use framing to transform everyday reality into a cinematic event.

Consider one of the most famous Lumière films, *The Arrival of a Train at La Ciotat Station* (1897). Lumière might have framed the shot by setting the camera

5.61–5.62 Playing with perspective. In *Daisies,* Vera Chytilová uses setting, character position, and deep focus to make a comic point about the two women's amused deflation of men (5.61). Lech Majewski's *The Mill and the Cross* combines the flat canvas with the real locations and figures in the foreground, inviting us into a world that is half-painting, half three-dimensional landscape (5.62).

5.62

perpendicular to the platform, letting the train enter the frame from the right. Instead, Lumière stationed the camera at an oblique angle. The result is a dynamic composition, with the train arriving from the distance on a diagonal **(5.64).** If the scene had been shot perpendicularly, we would have seen only a string of passengers' backs climbing aboard. Lumière's oblique angle lets us see people's expressions and watch the ways they walk. There is also deep space: Some figures move into the foreground and others can be glimpsed in the distance.

Simple as it is, this single-shot film, less than a minute long, shows that camera position shapes the way we perceive the filmed event. The same thing happens on a more intimate scale with another Lumière short, *Baby's Meal* (1895). A long shot would have situated the family in its garden, perhaps showing off their wealth. Instead, Lumière framed the figures at a medium distance, which emphasizes the family's gestures and facial expressions **(5.65).** The frame's sizing of the event has guided our understanding of the event itself.

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5.63–5.65 Louis Lumière, early master of framing. In an era in which a camera might be the size of an office desk, the Lumière camera was portable and could be set up on a tripod quickly (5.63). For *The Arrival of a Train at La Ciotat Station,* Lumière's diagonal framing supplied a dynamic composition and considerable depth (5.64). For *Baby's Meal* (5.65), the framing is more frontal and intimate, excluding the garden in order to concentrate on the family.

A CLOSER LOOK

Virtual Perspective: 3D

Hold your index finger in front of your face. Close one eye, then open it and close the other. The finger shifts noticeably. That difference between each eye's perspective, aided by some brain work, helps you detect depth and volume in the world. But the ordinary camera lens presents a monocular—single-eyed—perspective on things. The result is a flat image, having only the dimensions of width and height. Since the beginning of cinema, some filmmakers have thought that if you could shoot scenes in ways that imitated the gap between our eyes, you could fool the viewer's brain into seeing convincing depth.

Filmmakers have created 3D imagery by shooting with two cameras, or with a single camera that has two lenses, or with a single lens that uses a beam-splitter to send the images to different cameras **(5.66).** In any case, what gets projected, as you know if you've ever peeped over your 3D glasses in the theater, is an image with two superimposed pictures. When you look through the glasses again, the two images merge.

For reasons still not fully understood, current 3D imagery typically lacks the volume and solidity of the real world. Nonetheless, we can still respond strongly to 3D moving pictures. When something thrusts out of the frame toward us, or when something glides into depth, the kinetic impact can be irresistible **(5.67).** Even movement into depth can be startling **(5.68).**

Stereoscopic filmmaking goes back to the beginnings of cinema, and it has never completely gone away. The first wave of theatrically successful 3D films came in the early 1950s, using two projectors and glasses with filters (red and green, or polarizing). Some people had trouble seeing the 3D effect and got headaches. The trend soon faded. Occasional 3D films, mostly in the exploitation

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5.67–5.68 In your face and under the screen. The streaming wakes of the lightcycles float out into the auditorium in *Tron: Legacy* (5.67). At the climax of *House of Wax* (1953) the mad scientist's assistant pops up from the foreground (5.68). In 3D projection, he seems to rise up from the front row of the audience.

5.66 A 3D camera rig. James Cameron looks into a video viewfinder as he operates the camera system he helped invent for *Avatar.*

realm, were made in the years that followed. The introduction of Imax in 1985 revived the format for upscale audiences. The system used a high-resolution 70mm format, and the detail in the image helped minimize visual problems suffered by viewers. Most of the 3D Imax films were short documentaries, however, and projection utilized a complex dual-film system that commercial theaters could not afford to adopt.

The broadest resurgence of the format began in 2005, when the first digital 3D systems were installed and Disney released *Chicken Little.* Although the Imax dual-projection system could be employed for blockbuster releases like *The Dark Knight,* most theaters would need digital projection for 3D. The stereoscopic

A CLOSER LOOK

format helped studios convince theater chains to go digital. The fact that 3D screenings commanded higher ticket prices was also a persuasive factor.

Pushed by enthusiasts of the technology, notably James Cameron and DreamWorks Animation producer Jeffrey Katzenberg, thousands of 3D-capable theaters were equipped. Hollywood increased production of 3D films, usually animation and entries in the action, science fiction, and fantasy genres. More sophisticated glasses using various kinds of optical technology emerged, although exhibitors did not embrace a single standard.

The reemergence of 3D, although motivated by business concerns, created more artistic decisions for filmmakers. One option, popular at the outset, was to maximize deep focus. If all planes were clear and sharp, the 3D effect would be stronger. Maintaining such extreme depth of field was much easier in animation than in live-action filming. But uniformity of focus wasn't really necessary, and soon filmmakers returned to using shallower depth of field to guide the spectator's eye. *Coraline* experimented with soft foregrounds and shallow focus. Soon shallow focus became common in 3D films **(5.69).**

Filmmakers faced another choice. How should the depth be organized? Should 3D visuals burst out into the auditorium? Or should the frame be more like a window, inviting us into the realm beyond? Technically, the decision depends on setting the lenses' *convergence point.*

Again, if you hold your finger close to your face, your eyeballs pivot slightly inward to focus on it. Similarly, a 3D camera's lenses usually don't point directly forward along parallel lines. They are turned slightly inward, so their lines of sight converge, and like our eyes they can pivot at various angles. At the point where the lenses' fields of view converge, the two images will be perfectly aligned, with no ghostly doubling. If you take off your 3D glasses during a film, you will see objects onscreen that aren't doubled. These mark the convergence point, which defines the screen plane—essentially the "window" through which we look into the depth of the shot.

If the convergence point is set a short distance in front of the camera, say 5 feet, any action taking place beyond that distance will appear to recede into depth behind the screen. But if the cameras' lenses are set at a more distant convergence point, well into the depth of the space being filmed, that defines the screen plane as farther back. As a result, anything in front of the convergence point will seem to push out toward the viewer. The effect is sometimes called a "pop-out."

The 1950s 3D movies exploited the pop-out option. Viewers were attacked by spears, arrows, lions, and even paddle balls. This effect was perceived as tacky and clichéd, and it helped hasten the end of the cycle. Aggressive 3D was revived to camp effect in the Paul Morrissey/Andy Warhol film *Flesh for Frankenstein* (1974), in which a spear jabs Dr. Frankenstein's inner organs toward the viewer's face.

The window-view alternative proved more popular in the digital era. Cinematographer Claudio Miranda, who shot *Tron: Legacy* in 3D, describes how this approach "makes the screen appear like a box you're looking into, and keeps things from leaping out unnaturally. Additionally, we went against the 'rule' of deep-focus depth-of-field for 3D and let our backgrounds go really soft, which helps guide the eye along with depth cues." The filmmaker could accentuate the depth in the screen world by pulling back through space, letting new elements glide into the foreground.

Some films released in 3D have been shot in 2D (35mm or digital) and then converted with postproduction software. Although some viewers complained that the conversions weren't vivid enough, many directors and cinematographers felt that originating a film in 3D limited their choices. The production is time consuming, and the cameras are bulky.

Lighting raises particular problems. Sometimes the highlights on a face or object will be different for each eye. In addition, the audience sees the image as darker than it really is. "You are watching the movie through sunglasses, essentially," says one cinematographer. As a result, putting filters on the camera lens reduces the illumination even more.

3D, like other areas of cinematography, opens up opportunities, but it also forces new decisions. The filmmaker must still choose according to larger purposes, and every choice may affect the form and style of the finished film.

5.69 Out-of-focus 3D backgrounds. In *The Life of Pi,* the hero is in the foreground, in sharp focus. Behind him, a crowd of meerkats watches curiously. Compare 5.46 and 5.47.

Lumière's simple craftsmanship reminds us that the act of framing has many implications. The size and shape of the frame matter. For another, the frame defines onscreen and offscreen space. Framing also creates a vantage point, and that has a certain distance, angle, and height. And, in cinema, framing can move in relation to what it films. We'll look more closely at all these creative possibilities.

Frame Dimensions and Shape

Painters and still photographers can display images of any shape—ovals, triangles, diamond-shaped panels. Filmmakers are limited to a rectangle. But filmmakers can decide the width of that rectangle, and in some cases they can change the shape of the image inside it.

Aspect Ratios   The ratio of frame width to frame height is called the **aspect ratio.** For example, an image that is twice as wide as it is high is said to be in a 2:1 ratio. Thomas Edison, Lumière, and other early film inventors set the proportions at approximately four by three, yielding an aspect ratio of 1.33:1. In the silent era, there wasn't complete uniformity about this, and some filmmakers chose to experiment with ratios. Experiments with *widescreen* formats began quite early. Abel Gance shot and projected sequences of *Napoleon* (1927) in what he called *triptychs* **(5.70).** In contrast, the Soviet director Sergei Eisenstein argued for a square frame, which would make compositions along horizontal, vertical, and diagonal directions equally feasible. A 2014 feature, *Mommy*, put Eisenstein's idea into practice.

Synchronized sound technology in the late 1920s demanded more standardized aspect ratios. Adding the sound track to the film strip required adjusting the shape of the image. At first, some films were printed in an almost square format, usually about 1.17:1 **(5.71).** But in the early 1930s, the Hollywood Academy of Motion Picture Arts and Sciences established the so-called **Academy ratio** of 1.37:1. This modified the classic 1.33:1 format to allow room for a soundtrack **(5.72).** The Academy ratio of 1.37:1 was widely employed throughout the world until the mid-1950s, when a 1.85:1 ratio became one norm. Since then, a great many widescreen ratios have appeared in 35mm and digital filmmaking; the most common ones are reviewed in **5.73–5.77.**

The simplest way to create a widescreen image is by **masking** it at some stage in production or exhibition **(5.78).** This masking is usually called a *hard matte*. Alternatively, many contemporary films are shot full-frame (that is, between 1.37:1 and 1.17:1) in the expectation that they will be masked when the film is shown in theaters or transferred to video. Sometimes the full-frame option results in lights or sound equipment being visible on the film strip **(5.79).** Another way to create a widescreen image is by using an **anamorphic** process. Here a special lens squeezes the image horizontally, either during filming or in printing. The projectionist uses a comparable lens to unsqueeze the image during projection **(5.80, 5.81).**

5.70 **Early widescreen.** A panoramic view from *Napoleon* joins images shot with three cameras. Gance used the effect to show a single huge expanse or to put different images side by side.

5.71 Aspect ratio 1.17:1—early sound films. The frame from *Public Enemy* shows the squarish ratio of some early sound films.

5.72 Aspect ratio 1.37:1—Academy ratio. The frame from *The Rules of the Game* shows the standardized ratio used until the mid-1950s.

5.73 Aspect ratio 1.85:1—common North American ratio. The example here is from *Me and You and Everyone We Know.*

5.75 Aspect ratio 1.75:1—common European ratio. This ratio fits widescreen television monitors (16 × 9) and many digital-video formats. Shown here is *Last Tango in Paris.*

5.76 Aspect ratio 2.35:1—anamorphic widescreen. This frame from *The Valiant Ones* shows the ratio standardized in the 1950s for the CinemaScope anamorphic process.

5.77 Aspect ratio 2.2:1—70mm widescreen. *Ghostbusters* displays the ratio that was chiefly used for 70mm presentation.

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The Grand Budapest Hotel employs several aspect ratios. We consider the consequences of this for the director's style in "Wes Anderson takes the 4:3 challenge."

◀ **5.74** Aspect ratio 1.66:1—common European ratio. Also found in digital video productions, this ratio is shown here in a frame from *Une chambre en ville.*

5.78–5.79 Masking before and during projection. Agnès Varda's *Vagabond* was masked during filming or printing (5.78). The full-frame image from Martin Scorsese's *Raging Bull* (5.79) includes a microphone at the top edge. This would not be seen in the theater, because the top and bottom of the frame would be masked in the projector. The colored lines in our illustration show a projection framing at 1.85:1.

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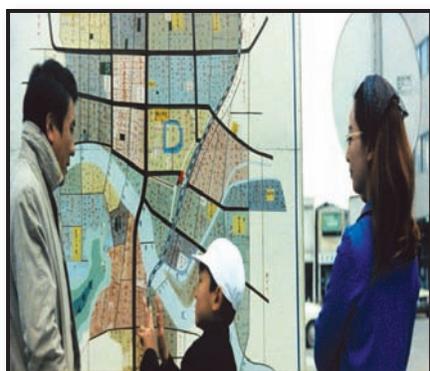
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5.80–5.81 Anamorphic widescreen. A frame from Nagisa Oshima's anamorphic film *Boy,* as squeezed on the original film strip (5.80). The same frame, unsqueezed as it would be in projection (5.81). The anamorphic aspect ratio established by CinemaScope was 2.35:1 until the 1970s; for technical reasons, it was adjusted to 2.40:1. This is the aspect ratio of Panavision, today's most frequently used anamorphic system.

CREATIVE DECISIONS

Using Widescreen Framing

The practiced filmmaker knows that widescreen cinema, either masked or anamorphic, creates a different visual impact than the 1.37 ratio. The screen becomes a band or strip, emphasizing horizontal compositions. By offering more image area, a widescreen format offers bigger challenges about guiding attention than does the 1.37 ratio. How do you compose for it? Can you achieve the tight packing you can get in the narrower frame?

As you'd expect, filmmakers initially thought the format ideal for the sweep and spectacle of Westerns, travelogues, musicals, and historical epics. But what about ordinary dramatic conversations and more intimate encounters? A common solution today is to fill the frame with a face (p. 46). This choice will in turn require the director to cut up the scene more, as we'll see in the next chapter. For more distant shots, the director is likely to put the important information off center, so that the viewer can concentrate on that **(5.82, 5.83).**

The wide formats challenge ambitious directors to design more screen-filling compositions. Those can't be as compact as the deep-focus compositions of the 1940s (5.48, 5.49), but they can achieve pictorial force. For example, the wide

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We trace the artistic options available in early CinemaScope in "Scoping things out: A new video lecture." For an Asian comparison, there's "Another Shaw production: Anamorphic adventures in Hong Kong."

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The subtleties of emphasis that can be achieved with anamorphic widescreen framings are discussed in "Gradation of emphasis, starring Glenn Ford."

5.82–5.83 Spacing out the wide frame. Souleymare Cissé's *Yeelen* frames its hero in a slightly off-center position (5.82), a common choice in widescreen compositions. More extreme is the confrontation in John McTiernan's *Die Hard,* with the points of interest thrust to the left half of the frame (5.83). Off-center framings like these suggest action taking place offscreen, with the empty areas shaping our expectations about the next shot (see 6.19–6.20).

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5.84–5.85 Widescreen for dense composition. Akira Kurosawa's *Sanjuro* uses the anamorphic process of Tohoscope, a Japanese equivalent of CinemaScope, to create a dense deep-focus composition (5.84). The busy scene from *Chunhyang* (5.85) fills the frame with bustle and glances. Director Im Kwon-Taek guides our attention around the wide frame according to who is speaking, who is facing us, and who reacts to the speaker.

format may build up significant depth, even in a confined setting **(5.84).** Or the director may multiply points of interest within the frame. This requires care in staging and timing the actors' performances **(5.85).**

Masks and Multiple Images   The rectangular frame hasn't prevented some filmmakers from embedding other image shapes in it. This has usually been done by attaching **masks** over either the camera's or the printer's lens to block the

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5.86–5.88 Changing compositional shape. In *La Roue,* Gance employs a variety of circular and oval masks (5.86). In one shot of Griffith's *Intolerance,* most of the frame is boldly blocked out to leave only a thin vertical slice, emphasizing the soldier's fall from the rampart (5.87). Orson Welles used an iris to close a scene in *The Magnificent Ambersons* (5.88). The old-fashioned device adds a nostalgic note to the sequence, the last moment of shared happiness among the characters.

passage of light. Masks were quite common in the silent cinema **(5.86, 5.87).** A moving circular mask that opens to reveal or closes to conceal a scene is called an **iris.** A number of directors in the sound cinema have revived the use of irises and masks **(5.88).**

We also should mention experiments with *multiple-frame,* or *split-screen,* imagery. In this process, two or more images, each with its own frame dimensions and shape, appear within the larger frame. Gance's *Napoleon* tried it on an epic scale (5.70), but it was used earlier, often to present scenes of telephone conversations. Modern filmmakers have turned to multiple-frame imagery to build suspense; we gain a godlike omniscience as we watch different story actions at exactly the same moment **(5.89).** The technique can be used subjectively as well **(5.90).**

Choices about aspect ratio and embedded imagery shape the spectator's experience in important ways. Graphic factors such as masses, edges, and movement gain their impact in relation to frame width. Just as important, frame size and shape guide the spectator's eye. The filmmaker can concentrate our attention through masking or composition, or shift our attention across the frame by creating different points of interest. The same possibilities exist with multiple-frame imagery, which must be carefully coordinated either to focus the viewer's attention or to send it ricocheting from one image to another.

Onscreen and Offscreen Space

Whatever its shape, the frame limits the image with a boundary. Our eyes have a very wide field of view, somewhat over 180 degrees, but a camera lens shows a much smaller slice of the world. Is this a disadvantage?

No. The frame shapes our experience, calling attention to what the filmmaker wants us to see. Every act of framing, as Lumière intuitively realized, creates relationships among the things we see. In Figure 5.64, the train forms a diagonal, and the people move toward us. Framing the scene differently would have created different visual patterns, different relationships between the train and the travelers. Moreover,
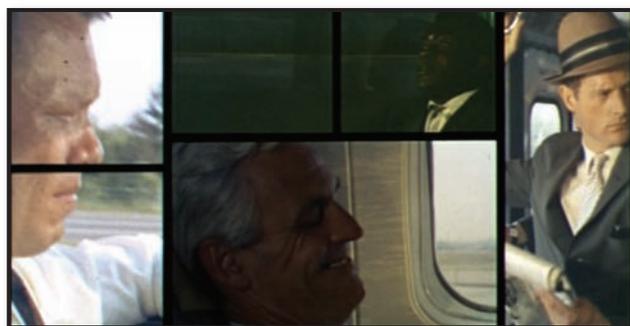
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5.89–5.90 Multiple-frame imagery. Split-screen shots often present two or more events taking place at the same time. The opening sequence of *The Thomas Crown Affair* (1968) shows men converging to commit a robbery (5.89). In *127 Hours,* the hero is trapped in a remote canyon, and Danny Boyle uses multiple frames to convey his perceptions and imaginings (5.90).

the fact that the frame carves out only a little from the overall visual field means that filmmakers can creatively exploit the space *offscreen,* the areas not shown inside the frame.

As viewers we help the filmmaker with this task, because we know that what's in the frame is part of a continuous world. If the camera moves away from a person to show someone else, we assume that the first person is still there, outside the frame. Even in an abstract film, we can't resist the sense that the shapes and patterns that burst into the frame come from somewhere. So the filmmaker can imply the presence of things out of frame. You can have a character look or gesture at something offscreen. As we'll see in Chapter 7, sound can offer potent clues about offscreen space. And something from offscreen can come into the frame.

We're most aware of offscreen space when it creates suspense or surprise. A shadow from an unknown person outside the frame may slide across the shot and build up our expectations of a threat. Likewise, moments when a monster bursts into the frame are conventional in horror films, as we've seen in the 3D *House of Wax* (5.68). But any genre can employ incursions from offscreen. During a party scene in *Jezebel,* the heroine is the main focus of attention until a man's hand comes abruptly into the frame **(5.91–5.94).** Director William Wyler has used the selective powers of the frame to exclude something of great importance and then introduce it with startling effect. More systematically, D. W. Griffith's *Musketeers of Pig Alley* makes use of sudden intrusions into the frame as a motif developing across the whole film **(5.95, 5.96).**

These examples exploit areas lying beyond the four frame edges. There's also offscreen space behind parts of the setting, as when we see a mysterious door and hear sounds from inside it. The filmmaker can activate yet another offscreen zone, that of the camera and the area around it. In a thriller, a moving camera may represent the optical viewpoint of a stalker who isn't shown directly. The zone around the camera is used more imaginatively in Abbas Kiarostami's *Through the*

5.91–5.94 Offscreen space revealed. In *Jezebel,* the heroine, Julie, greets some friends in medium shot (5.91). Suddenly a fist holding a glass appears in the left foreground (5.92). Julie notices and comes forward flirtatiously (5.93), and the camera retreats slightly to frame her with the man who toasted her (5.94). It's an attention-getting way to introduce Julie's new suitor.


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5.95–5.96 Offscreen space as motif. *The Musketeers of Pig Alley*: A gangster is trying to slip a drug into the heroine's drink. We're not aware that her friend, the Snapper Kid, is watching until a plume of his cigarette smoke wafts into the frame (5.95). At the film's end, when the Snapper Kid receives a payoff, a mysterious hand thrusts into the frame to offer him money (5.96).

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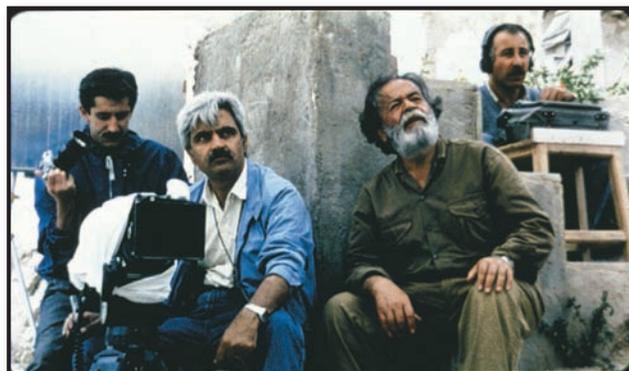
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5.97–5.99 The space behind the camera. In *Through the Olive Trees,* we watch as the actors redo the scene (5.97). Eventually, shots begin to show the director and his crew behind the camera (5.98). After several repetitions, the director walks in from behind the camera and tries to resolve the problem (5.99).

Olive Trees. A film crew is shooting a scene, and we watch through the lens of the camera **(5.97–5.99).** As the conflicts between two young actors spoil take after take, we watch tensely, knowing that behind the camera the crew is getting more and more frustrated. Filmmakers are well aware that we need only a few hints to start imagining things taking place outside the frame.

Camera Position: Angle, Level, Height, and Distance of Framing

When Louis Lumière decided to frame the train from an oblique angle and to present his family at breakfast in a fairly close setup (5.64, 5.65), he was doing what everyone with a camera does. He made decisions about camera position. In an animated film, there may not be an actual camera used in production, as with

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5.100–5.102 Types of camera angle. A straight-on angle in *The Chronicle of Anna Magdalena Bach* (5.100). In this shot from *Family Plot* (5.101), a high-angle framing shows an investigator trailing a suspect as she leaves a funeral. A low-angle view places sailors and a machine gun against the sky in *They Were Expendable* (5.102).

drawing on film or software-based animation. Even in animation, though, the framing implies that the shot is viewed from a certain spot in space.

Angle   The frame positions us at some *angle* on the subject. The filmmaker faces a huge number of choices here, but we can say roughly that the framing can present a straight-on angle, a high angle, or the low angle. You're familiar with these from taking photos and videos **(5.100–5.102).**

Level   The frame can be more or less level—that is, parallel to the horizon. If the framing is tipped to one side or the other, it's said to be **canted.** Canted framing (also called a "Dutch angle") is relatively rare, although a few films make heavy use of it, such as Orson Welles's *Mr. Arkadin,* Carol Reed's *The Third Man,* and Wong Kar-wai's *Fallen Angels* **(5.103).** It can create rather disruptive effects **(5.104).**

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5.103–5.104 The tipped camera. A canted framing in *Fallen Angels* (5.103). In Christopher Maclaine's *The End,* a canted framing makes a steep street in the foreground appear level and tips the houses in the background (5.104).

Height   We may not think as much about camera height as we do angle and horizontal balance, but it's another area of choice for the filmmaker. Height is related to camera angle, since some angles demand that you position the camera higher or lower than the subject. But if the angle is kept straight in, crouching to take a snapshot creates a different composition than taking it from eye level. For instance, the Japanese filmmaker Yasujiro Ozu films from a low height but uses a straight-on angle (4.155, 6.142–6.145). This choice gives his shots a distinctive visual style.

Distance   The framing of the image stations us relatively close to the subject or farther away. This aspect of framing is usually called *camera distance.* The terms for camera distance are approximate, and they're usually derived from the scale of human bodies in the shot. Our examples are all from *The Third Man.*

In the **extreme long shot,** the human figure is lost or tiny **(5.105).** This is the framing for landscapes, bird's-eye views of cities, and other vistas. In the **long shot,** figures are more prominent, but the background still dominates **(5.106).** Shots in which the human figure is framed from about the knees up are called **medium long shots (5.107).** These are common, since they permit a nice balance of figure and surroundings.

The **medium shot** frames the human body from the waist up **(5.108).** Gesture and expression now become more visible. The **medium close-up** frames the body from the chest up **(5.109).** The **close-up** is traditionally the shot showing just the head, hands, feet, or a small object. It emphasizes facial expression, the details of a gesture, or a significant object **(5.110).** The **extreme close-up** singles out a portion of the face or isolates and magnifies an object **(5.111).**

5.105 Extreme long shot

5.106 Long shot

5.107 Medium long shot

5.108 Medium shot

5.109 Medium close-up

5.110 Close-up

5.111 Extreme close-up

5.112 Shot scale versus camera position. In *La Passion de Jeanne d'Arc,* the framing is that of a rather long shot even though Jeanne's head is all we see of her. If the framing were simply adjusted downward, her whole body would be visible, along with much of the castle.

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Even a simple framing can subtly shape the viewer's response, as we argue in "Where did the two-shot go? Here."

Note that the size of the photographed material within the frame is as important as any real camera distance. From the same camera distance, you could film a long shot of a person or a close-up of King Kong's elbow. We would not call the shot in **5.112** (from *La Passion de Jeanne d'Arc*) a close-up just because only Jeanne's head appears in the frame. In judging camera distance, the relative scale of the view determines how we label the shot.

Categories of framing are obviously matters of degree. No precise cutoff point distinguishes between a long shot and an extreme long shot. Filmmakers and film researchers find these terms useful, and they're usually clear enough for descriptive purposes.

Functions of Framing   Sometimes we're tempted to assign absolute meanings to angles, distances, and other qualities of framing. Does filming from a low angle automatically present a character as powerful? Does framing from a high angle always render the character as dwarfed and defeated? Verbal analogies are especially seductive. Does a canted frame mean that "the world is out of kilter"?

Making and watching movies would be a lot simpler if framings carried such hard-and-fast meanings. But the individual films would lose their uniqueness and richness. In fact, framings don't carry absolute or general meanings. In *some* films, angles and distance imply the meanings mentioned above, but in other films—probably most films—they don't. To rely on formulas is to forget that meaning and effect always stem from the film's overall form and the immediate context.

For instance, at many points in *Citizen Kane,* low-angle shots of Kane do suggest his looming power. Interestingly, however, the film's lowest camera positions occur at the point of Kane's most humiliating defeat—his miscarried gubernatorial campaign **(5.113).** Here the low angle functions to isolate Kane and Leland. Similarly, the world is hardly out of kilter in the shot from Eisenstein's *October* shown in **5.114.** The canted frame dynamizes the effort of pushing the cannon. If the cliché about high-angle framings were correct, **5.115,** a shot from *North by Northwest,* would express the powerlessness of Van Damm and Leonard. In fact, the angle of Hitchcock's shot wittily prophesies how they plan to carry out a murder.

These three examples indicate that we can't reduce the richness of cinema to a few recipes. We must, as usual, look for the *functions* the technique performs in the particular *context* of the total film.

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5.113–5.115 Context controls framing. In *Citizen Kane,* the protagonist is seen from below during his greatest defeat. By setting the figures against the ceiling and an abandoned campaign headquarters, the low angle suggests that Kane is increasingly isolated (5.113). A canted framing, as in Eisenstein's *October,* can create a dynamic composition and suggest a powerful force moving against gravity (5.114). In *North by Northwest*, as Van Damm reflects on pushing his mistress out of a plane, and the camera rises above him, he says, "I think that this is a matter best disposed of from a great height" (5.115).

Camera Position in a Shot from The Social Network

One of the most important matters a director decides is the placement of the camera. "There's only one right spot for the camera in each shot," the adage goes, "and it's my job to find it."

Consider a shot from *The Social Network*. Throughout the film Mark Zuckerberg has been characterized as a driven hacker. We've seen that his scowling face can seem aggressive, especially in contrast to that of his friend Eduardo (4.94–4.97). Mark's rare smiles are somewhat twisted and self-regarding. But at the moment when he has just auditioned new programmers for Facebook, he seems to wear a grin of genuine joy.

Instead of supplying a close-up of this expression, though, director David Fincher frames Mark in long shot **(5.116).** This is consistent with the narrational weight of the scene, as our range of knowledge has been restricted to Eduardo's. But the camera position also cools down any admiration we might be feeling for Mark. A closer view might have made him more sympathetic.

❝ I don't like close-ups unless you can get a kick out of them, unless you need them. If you can get away with attitudes and positions that show the feeling of the scene, I think you're better off using the close-up only for absolute punctuation—that's the reason you do it. And you save it—not like TV where they do everything in close-up."
—Howard Hawks, director, *His Girl Friday*

5.116 **Camera distance and sympathy.** There are plenty of close shots of Mark elsewhere in *The Social Network*. Yet at his moment of triumph, the framing (from Eduardo's optical point of view) plays down an expression that could humanize him a bit. Perhaps the somber lighting, not shared with the background characters, even gives his smile a sinister edge.

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For filmmakers working with narrative form, camera placement is central to visual storytelling. A framing can stress a narratively important detail **(5.117, 5.118).** Camera distance specifies where characters are and how they respond to each other. Orchestrated by editing, as we'll see in the next chapter, distances and angles form patterns that guide us in building up the story.

Framing also can put us in a character's place. In Chapter 3, we saw that a film's narration may present story information with some psychological depth (p. 90). One option is perceptual subjectivity, the attempt to render what a character sees or hears. A shot's distance and angle may prompt us to take it as seen through a character's eyes, creating a *point-of-view* (*POV*) shot **(5.119, 5.120).** (See also p. 90.)

5.117–5.118 Camera distance as emphasis. The tears of Henriette in *A Day in the Country* are visible in extreme close-up (5.117). In *Day for Night,* a close framing emphasizes how carefully the film director arranges an actor's hands (5.118).

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5.119–5.120 Subjective framings. In *Fury,* the hero in his jail cell is seen through the bars from a slightly low angle (5.119). The next shot, a high angle through the window toward the street outside, shows us what he sees, from his point of view (5.120).

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5.121 Camera angle as a motif. In *The Maltese Falcon,* Kasper Gutman is frequently photographed from a low angle, emphasizing his obesity.

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One way to add visual interest is to shoot straight into the rear plane of the setting, as we explain in "Shot-consciousness" and "VIFF 2013 finale: The bold and the beautiful, sometimes together."

Framings may serve the narrative in yet other ways. Across an entire film, the repetitions of certain framings may associate themselves with a character or situation. That is, framings may become motifs unifying the film **(5.121).** Alternatively, certain framings in a film may stand out by virtue of their rarity. In a film composed primarily of long shots and medium shots, an extreme close-up will have considerable force. The early scenes of Ridley Scott's *Alien* present few shots depicting any character's point of view. But when Kane approaches the alien egg, we see close views of it as if through his eyes, and the creature leaps straight out at us. The POV shot provides a sudden shock and marks a major turning point in the plot.

Apart from their narrative significance, framings can add a visual interest of their own. Close-ups can give hands and feet a weight they wouldn't have if we were just attending to dialogue and facial expression **(5.122).** Long shots can permit us to explore vistas. Much of the visual delight of Westerns, of David Lynch's *The Straight Story,* and other films rendering landscapes arises from long shots that make huge spaces manifest **(5.123).** By including a range of information, the long-shot framing encourages us to search for details or discover abstract patterns **(5.124).**

In both narrative and nonnarrative films, our eye also enjoys the formal play presented by unusual angles on familiar objects **(5.125, 5.126).** "By reproducing the object from an unusual and striking angle," writes Rudolf Arnheim, "the artist forces the spectator to take a keener interest, which goes beyond mere noticing or acceptance. The object thus photographed sometimes gains in reality, and the impression it makes is livelier and more arresting."

The filmmaker may find ways to use framing for comic effect. You'll recall that in *Our Hospitality* Keaton stages many gags in depth. Now we can see that well-chosen camera angles and distances are also vital to the gags' success. If you turn back to p. 156, you'll notice that the railroad scene shown in 4.175 couldn't

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5.122–5.124 Camera distance for intricacy and scope. The close shots of thieves' surreptitious gestures have a narrative function in Robert Bresson's *Pickpocket,* but they also create a dazzling ballet of fingers and wrists (5.122). Helicopter shots in *Lessons of Darkness* give the desolate burning oilfields of Kuwait an eerie, horrifying grandeur (5.123). In Hou Hsiao-hsien's *Summer at Grandpa's,* the boy from the city visits his disgraced uncle, and the neighborhood is presented as a welter of rooftops sheltering a spot of bright red (5.124).

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5.125–5.126 Seeing differently. René Clair in *Entr'acte* frames a ballerina from straight below, transforming the figure into a pulsating flower (5.125). In *La Passion de Jeanne d'Arc,* the upside-down framings are not motivated as a character's point of view; they build up to the frenzy of the soldiers' massacre of the crowd witnessing Jeanne's death (5.126).

be as effective if it were filmed from the side and in extreme long shot. That way, we wouldn't clearly see that the two parts of the train are on parallel tracks. And we wouldn't see the engineer's unconcerned posture, which indicates his failure to realize what has happened. Like Lumière at the train station, Keaton chose depth staging and a diagonal camera position. The result creates a composition that highlights certain relations between things.

Similarly, offscreen space is vital to the gag shown in 4.184–4.186. Here Keaton lays out the comedy in time rather than space. Willie tugs on the rope.

5.127 Framing creates a visual joke. In *Play Time,* M. Hulot reacts with a start when he notices that a guard locking a door seems suddenly to have sprouted horns—the door handles.

Then an unseen effect of that tug becomes visible as the Canfield son hurtles past and disappears. Finally, Willie reacts and is dragged down into the abyss below the frameline. Keaton could have framed this moment in a different way—say, from a low angle that showed both Willie and the Canfield boy in the same frame. But that would have sacrificed the suspense of waiting for Canfield to plummet through the shot. Throughout *Our Hospitality* our reaction to Keaton's humor depends on his careful combination of mise-en-scene and framing.

In Tati's *Play Time,* mise-en-scene and camera position cooperate to create pictorial jokes. In **5.127,** a visual pun issues from the precisely chosen camera angle and distance, as well as from the mise-en-scene: the man's stooping posture and the door handles make him look like a goat. Tati maintained the approach of silent comedy within the sound cinema. As with other filmmakers, his choice of framing was governed by imagining how it would affect the viewer.

The Mobile Frame

Cinema isn't the only visual medium that employs framing. Photographs, paintings, and comic-book panels have aspect ratios, imply things happening outside the frame, and present an implied vantage point on the scene. But there is one resource of framing that is specific to films, either photochemical or digital. In cinema, the frame can *move* with respect to what it shows us.

In cinematography, *mobile framing* allows the filmmaker to change the camera angle, level, height, or distance *during* the shot. Just as important, the movement of the frame often persuades us that we're moving too.

Types of Mobile Framing   We usually refer to the ability of the frame to be mobile as *camera movement.* In live-action filming, mobile framing is usually achieved by moving the camera physically during production. There are several kinds of camera movement, each with a specific effect onscreen.

The **pan** (short for *panorama*) movement swivels the camera on a vertical axis. The camera as a whole does not move to a new position. Onscreen, the pan scans space horizontally, as if the camera is "turning its head" right or left **(5.128, 5.129).** The **tilt** movement rotates the camera on a horizontal axis. It is as if the camera's head were swiveling up or down. Onscreen, the tilt movement yields the impression of unrolling a space from top to bottom or bottom to top **(5.130, 5.131).**

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5.128–5.131 Panning and tilting the camera. During a shot in Dreyer's *Ordet,* the camera pans right to keep the figures in frame as they cross a room (5.128, 5.129). François Truffaut's *The Bride Wore Black* begins with a tilt down a church spire to the church door (5.130, 5.131).

In the **tracking** or **dolly shot,** the camera as a whole changes position, traveling in any direction along the ground—forward, backward, diagonally, in circles, or from side to side **(5.132, 5.133).** In the **crane shot,** the camera moves above ground level. Typically, it rises or descends, often thanks to a mechanical arm that lifts and lowers it. A crane shot may move vertically, like an elevator **(5.134, 5.135),** or at some angle forward or back **(5.136, 5.137).** Variations of the crane shot are helicopter and airplane shots as well as shots captured by drone aircraft.

Sometimes the camera movement we see is simulated—that is, no camera actually moved in production. The main examples are seen in animation. With cel animation, which photographs one frame at a time, the actual camera stays in one

> ❝ I realized that if I could just get to the really good scripts, I could approach it the way I approach literature—why the camera moves this way because of this motif— and then it became fascinating."
> —Jodie Foster, director, *Little Man Tate*

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5.132–5.133 The camera moves through space. During this lateral tracking shot in Erich von Stroheim's *Greed,* the camera moves rightward along with the two characters (5.132, 5.133). Note how the figures remain in the same basic relationship to the frame as they stroll along a sidewalk, while the front of the house that they hope to buy remains visible behind them.

5.134–5.137 Craning down, craning up. In *Ivan the Terrible,* from a high-angle view of Anastasia's bier (5.134), the camera descends to end on a straight-on framing of Ivan slumped at its base (5.135). At the end of Karel Reisz's *Morgan!* the camera cranes diagonally up and back to reveal that the hero's apparently innocuous flower garden proclaims his Communist sympathies (5.136, 5.137).
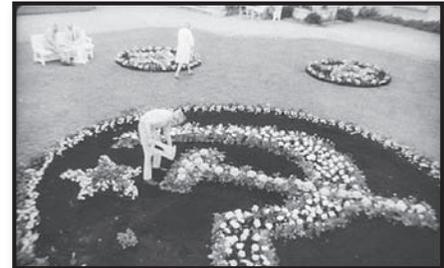

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5.138–5.140 Frame mobility without a moving camera. In *Peter Pan* cel animation imitates a pan shot.

> ❝ It's a compulsion of mine to move the camera, and I now know why. It enhances three-dimensionality. It puts you in the space, and if you move the camera the audience becomes aware of the space."
>
> —George Miller, director, *The Road Warrior*

position. With computer animation, there is no camera to speak of: Its vantage point is constructed through software. Nonetheless, an animation shot can mimic a camera movement (**5.138–5.140**).

Movement and Machinery   For many decades, camera movements in live-action production depended on putting the camera on a **dolly,** a heavy cart. The dolly can usually move on its own wheels, but it is often mounted on rails, hence the term *tracking* (**5.141**). Tracking shots are also made with cranes, even if the camera position doesn't rise or fall as in the usual crane shot. Suspended from a jib arm, the camera can glide over rough terrain. *The Thin Red Line* employed a 72-foot crane arm that let the camera slither over hills of tall grass during battle scenes. "The whole idea of using that crane was to not make it feel like a crane," says cinematographer John Toll. "We wanted it to look like the most continuous, smooth dolly that had ever been built."

Body-mounted camera units are common as well. These devices allow the camera operator to steer the camera while walking (see 1.21). Servo mechanisms adjust for imbalances and jerkiness, so the camera seems to glide or float. The prototype of the body-worn camera stabilizer is the Steadicam, initially used on

5.141 Tracking on rails. The camera crew must push the dolly on the tracks to capture the shot. (Compare 1.36.) The 360° tracking shot has become a common technique in modern cinema. The shot, being prepared for *The Departed,* was omitted from the final film.

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5.142–5.143 Steadicam tracking shot. In Martin Scorsese's *Raging Bull,* the Steadicam follows the protagonist out of his dressing room and through a crowd up to the boxing ring.

Bound for Glory, Rocky, and *The Shining.* Now many consumer video cameras have comparable image-stabilization systems.

A body-worn camera can go places that a dolly can't. The operator can smoothly follow actors climbing stairs, riding vehicles, and walking great distances **(5.142, 5.143).** Some directors have taken advantage of the Steadicam to create lengthy shots moving through many locales, as in the opening scenes of Brian De Palma's *Bonfire of the Vanities* and Paul Thomas Anderson's *Boogie Nights.*

Sometimes the filmmaker does not want smooth camera movements and prefers a bumpy image. Commonly, this sort of shot is created by the **handheld camera.** Instead of anchoring the camera on some support like a dolly or a stabilizer, the operator simply walks with the camera braced on the shoulder. This sort of camera movement became common in the late 1950s, with the growth of the *cinéma vérité* documentary trend **(5.144, 5.145).**

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5.144–5.145 The handheld camera and documentary. Don Pennebaker hand-holds the camera while filming his *Keep on Rockin'* (5.144). For the documentary *Primary,* a cameraman lifted the camera above his head and followed John F. Kennedy through a milling crowd (5.145).

5.146 Other camera supports. In *Leviathan*, a light GoPro camera, lashed to a pole, plunges into the sea and turns upward, yielding an eerie vision of gulls coming to feed on the netted fish.

Lightweight digital cameras allow cinematographers to create unusual camera mounts. For the race scenes of *Secretariat*, a miniature camera was attached to the end of a broomstick. GoPro cameras are usually used for sports recording, but in the poetic documentary *Leviathan* they convey unusual views of life on a commercial fishing boat. Some cameras were attached to the fishermen's helmets, while others were thrust into nets and under the sea. The result is an intimate view of the power and danger of nature **(5.146).**

The Zoom and the Mobile Frame   We've already seen that a zoom lens provides a continuous range of focal lengths. When the camera operator zooms during filming, the result is a mobile framing—even though the camera stays in one spot (5.41–5.43). Some viewers have trouble distinguishing a zoom-in from a forward tracking shot, or a zoom-out from a reverse tracking shot. But filmmakers know very well that there are major differences. The choice that the director and the cinematographer make can subtly shape how the viewer responds.

The zoom lens reduces or blows up some portion of the image. Although a tracking shot and a crane shot also enlarge or reduce areas of the frame, this is not all that they do. In the genuine camera movement, static objects in different planes pass one another at different rates. We see different sides of objects, and backgrounds gain volume and depth **(5.147, 5.148).** By contrast, a zoom enlargement doesn't alter the aspects or positions of the objects we see. Our vantage point is the same at the end of the shot as at the beginning **(5.149, 5.150).** When the camera moves, we sense our own movement through the space. In a zoom, a bit of the space gets steadily magnified or demagnified.

We've pinpointed these sorts of mobile framings as isolated options. But filmmakers frequently combine them within a single shot. The camera may track

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5.147–5.150 Tracking shot versus zoom. In Alain Resnais's *La Guerre est finie*, a tracking shot gives the objects considerable volume (5.147, 5.148). The wall has lost none of its solidity, and objects pass as if we were walking toward the sign. In Theo Angelopoulos's *Ulysses' Gaze,* a zoom shot simply blows up one area of the shot (5.149–5.150), as if we were adjusting a telescope. As the zoom occurs, the space looks flatter—the mark of a long-lens, or telephoto, framing.

and pan at the same time or crane up while zooming out. In *Vertigo,* an especially tricky combination track-*out* and zoom-*in* plastically distorts the shot's perspective and conveys the protagonist's dizziness. The device reappears in Spielberg's *Jaws,* when Sheriff Brody at the beach suddenly realizes that the shark has attacked a child. Simultaneously tracking and zooming in opposite directions has become common in modern Hollywood filmmaking to express a character's sense of confusion or astonishment (what director Sam Raimi calls the "warp-o cam"). The combinations are endless.

Frame Mobility: Functions   Camera movements have held an appeal for filmmakers and audiences since the beginnings of cinema. Some of the earliest films made by Lumière cameramen were shots from trains or Venetian gondolas, and even today these films have a mesmeric power. Why?

For one thing, camera movements can increase information about the space of the image. Pan and tilt shots present new areas of the setting, and tracking shots and crane shots supply continually changing perspectives on it. As the camera shifts its point of view, objects or figures are usually revealed, so frame mobility can create a flow of new information for the viewer. Camera movement can as well make objects seem sharper and more vivid than in stationary framings. Certain camera movements give bodies greater solidity. This is apparently one reason modern directors like to circle around the action (5.141), as in the opening scene of *Reservoir Dogs.*

What's more, we tend to see camera movement as a substitute for *our* movement. When we see a forward tracking shot, we feel that we're approaching something or backing away. A crane shot that pulls away from something at ground level makes us feel a little weightless. We aren't completely fooled, of course. We never forget that we're watching a film in a theater. But camera movement provides several convincing cues for movement through space. Indeed, so powerful are these cues that filmmakers often make camera movements subjective—motivated narratively to represent what a moving character sees. Camera movement can be a powerful cue for a point-of-view shot.

When we walk through the world, our eyes see a somewhat bouncy view, but our optical system compensates for the jerkiness and creates a sense of stable motion. This sense of smooth movement can be captured by a traveling shot made with a dolly, a jib arm, or a Steadicam. Sometimes, however, handheld shots are used to suggest subjective point of view **(5.151).** Alternatively, the handheld shot can simply create a sense of anxious movement, as if the action were glimpsed on the fly **(5.152).**

5.151

5.152

5.151–5.152 Handheld impressions. In Samuel Fuller's *The Naked Kiss,* a handheld POV shot heightens the impact of a fight (5.151). As the protagonist of *julien donkey-boy* walks, we don't get a POV shot, but Harmony Korine's bouncy, mini-DV cameras follow him shuffling through his neighborhood (5.152). The handheld camera's jerky pace complements the explosions of color created by printing video up to 35mm.

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5.155

5.153–5.155 Reframing. In *His Girl Friday,* director Howard Hawks strives to balance his compositions through reframing. When Hildy crosses from the left (5.153) to sit on the desk, the camera pans right to reframe her (5.154). This reframing is more noticeable than the next one: As Walter swivels his chair to face her, the camera reframes very slightly leftward (5.155).

> ❝ I kept wondering, 'Can people talk this much in a feature film and anybody care?' And so I had to go through every moment in those dialogue scenes and look for the little events I would treat as large events. Like the ringing of a phone or the blinds being opened. . . . I had to treat those as fairly major events and have the moves of the camera be motivated by them, so that it would be organic to the scene yet still visually interesting."
>
> —John Patrick Shanley, writer and director, *Doubt*

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One common function of tracking shots is to follow actors in conversation, as we discuss in "Walk the talk."

Frame Mobility and Space   We can get a little more specific about the purposes and effects of mobile framings if we consider some functions they have—in relation to cinematic space and time, in relation to the overall form of the film.

Camera movement creates an interplay of onscreen and offscreen space. If you track the camera in, you exclude more space from the shot (5.147, 5.148). If you track back, as in our example from *Jezebel* (5.91–5.94), you reveal some space that was previously offscreen. The mobile frame also continually affects the angle, level, height, or distance of the framing. A crane-up may change the angle from a low one to a high one; a track-in may change the shot scale from long shot to close-up.

As usual, one choice leads to others. For instance, just as filmmakers must decide how to motivate story actions or whether to motivate lighting sources, they must consider whether to motivate camera movement. Should you make the frame's changing space depend on the movement in the shot? Usually, the answer is yes. A panning movement may keep a racing car centered, a tracking shot may follow a character from room to room, or a crane shot may pursue a rising balloon.

Sometimes the camera movement is quite minimal, as with **reframing.** If a character moves in relation to another character, often the frame will slightly pan or tilt to adjust to the movement **(5.153–5.155).** Because reframing movements are usually slight and motivated by the figures' movement, we seldom notice them.

The framing can move independently of the figures too. Sometimes the camera drifts away from the characters to reveal something of narrative importance; the mobile frame is motivated not by figure movement but by the demands of the narration. In Jean Renoir's *Crime of M. Lange,* the protagonist sits at his desk writing Wild West stories, but the camera pans away to show cowboy gear cluttering his room, establishing that Lange lives in a fantasy world. Similarly, an independent camera movement can point out an overlooked clue, a sign that comments on the action, or an imminent threat. The camera can thus be relatively unrestricted in its range of knowledge, as in 5.136–5.137 when it reveals Morgan's hammer-and-sickle flower bed.

Filmmakers are especially fond of solo camera movements at the beginning of a scene or the entire film. A tracking shot can establish a locale and then smoothly let the characters enter the space **(5.156–5.159).** A camera movement can even foreshadow action to come. In the opening scene of *The Milk of Sorrow,* Fausta, a woman who is terrified of the world outside her home, tends her dying mother. Cinematographer Natasha Braier describes the purpose of a tracking shot **(5.160, 5.161)** early in the film: "The whole idea of this shot was to represent

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5.156–5.159 Camera movement independent of the figures. At the start of Otto Preminger's *Laura,* the camera glides through Waldo Lydecker's sitting room (5.156, 5.157), establishing him as a man of wealth and refinement, before revealing the detective McPherson (5.158). The framing then becomes motivated by figure movement, with the camera following McPherson's drift to a wall of masks (5.159).

5.158

5.159
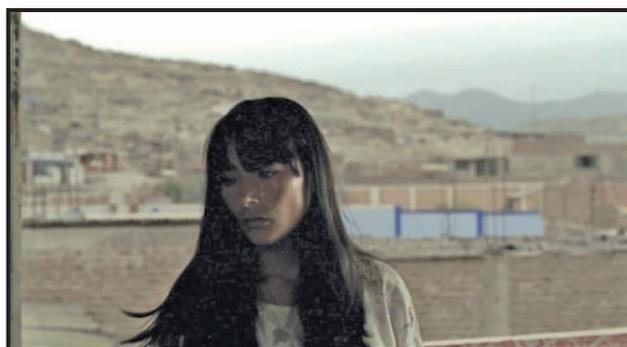
5.160

5.161

5.160–5.161 Camera movement anticipates story action. In the opening scene of *The Milk of Sorrow,* an initial framing shows the protagonist in the room where she has spent so much time (5.160). A slow track forward nearly eliminates the window frame, framing her against the outside world that she will now have to confront (5.161).

what is going to happen in the film. At the beginning of the story, Fausta is living with her mother in a hermetic world, and now that her mother is dead, she will have to venture outside, and because of the way we frame her at the end of that shot, she actually appears to be outside."

Whether dependent on figure movement or independent of it, the mobile frame can profoundly affect how we perceive the space of the action. Different sorts of camera movements create different treatments of space. In *Last Year at Marienbad,* Resnais often tracks down corridors and through doorways, turning a fashionable resort hotel into a maze. For *Young and Innocent,* Hitchcock (a virtuoso of camera movement) devised a shot that moves from a high-angle long shot of a ballroom over the heads of the dancers to an extreme close-up of a drummer's blinking

eyes. In such films as *The Red and the White,* Miklós Jancsó specialized in lengthy camera movements that roam among groups of people moving across a plain. His shots use all of the resources of tracking, panning, craning, zooming, and racking focus to sculpt plastic, ever-changing spatial relations.

When we see any mobile framing, we can ask: What particular trajectory does the camera pursue? How does it function to reveal or conceal offscreen space? Does the frame mobility depend on figure movement or is it independent, drawing our attention to other things?

Frame Mobility and Time   Mobile framing involves time as well as space, and filmmakers have realized that our sense of duration and rhythm is affected by the mobile frame. Since a camera movement consumes time on screen, it can create an arc of expectation and fulfillment. If the camera pans quickly from an event, we may be prompted to wonder what has happened. If the camera abruptly tracks back to show us something in the foreground that we had not expected, as in our earlier *Jezebel* example (5.91–5.94), we're taken by surprise. If the camera slowly moves in on a detail, gradually enlarging it but delaying the fulfillment of our expectations, the camera movement has contributed to suspense. In the pan shot across M. Lange's study mentioned earlier, Renoir makes us wonder why the camera strays from the main character and then answers the question by revealing Lange's fascination with cowboys.

The velocity of frame mobility is important too. A zoom or a camera movement may be relatively slow or fast. Richard Lester's *A Hard Day's Night* and *Help!* started a fad in the 1960s for very fast zoom-ins and -outs. In comparison, one of the most impressive early camera movements, D. W. Griffith's monumental crane shot in Belshazzar's feast in *Intolerance,* gains majesty and suspense through its inexorably slow descent toward the immense Babylonian set (4.12).

Sometimes the speed of the mobile framing functions rhythmically, as in musical films. During the "Broadway Rhythm" number in *Singin' in the Rain,* the camera cranes quickly back from Gene Kelly several times, and the speed of the movement is timed to accentuate the lyrics.

Frame velocity can also create expressive qualities—a camera movement can be fluid, staccato, hesitant, and so forth. *Cloverfield* is presented as an amateur video record of a monster's attack on Manhattan. At many points, the operator whips the camera around to capture a shocking incident, and our anxiety is intensified by the sudden speed of the panning movement **(5.162, 5.163).** By choosing the duration and speed of camera movements, the filmmaker can pace our understanding of the plot action.

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5.162–5.163 Speed of camera movement accentuates shock. In *Cloverfield* the video camera records an explosion in the street, and a whip pan to the right blurs the action (5.162). When the framing becomes stable again, we realize that the blurry movement was trying to follow the head of the Statue of Liberty rolling down the street (5.163).

Larger Patterns of Frame Mobility   While shaping time and space, mobile framings can become motifs across a film. In Carl Dreyer's *Day of Wrath,* the camera circles a shadowy chamber, surveying church officials who torture an old woman accused of being a witch. She tells her inquisitor that his death is imminent. Later in the film, her accuser lies on his deathbed, and a similar camera movement recalls her curse.

We see a more long-range motif in Hitchcock's *Psycho,* which begins and ends with a forward movement of the frame. During the film's first three shots, the camera pans right and zooms in on a nondescript building **(5.164).**
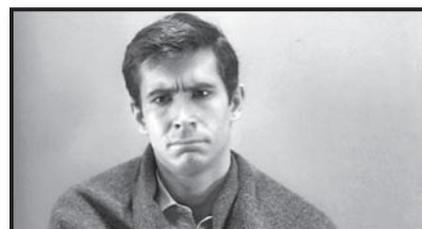
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5.164–5.169 Camera movement as a motif. The opening of *Psycho*: The camera pans right and zooms in on a building in a city-scape (5.164). The camera moves toward a window to reveal the heroine and her boyfriend sharing a lunchtime tryst (5.165–5.167). The film's next-to-last shot begins at a distance from Norman (5.168) and moves in so that we see his expression as we hear his thoughts (5.169).

Camera movements carry us under a window blind and into the darkness of a cheap hotel room **(5.165–5.167).** The camera's movement inward, the penetration of an interior, is repeated throughout the film, often motivated as a subjective point of view when various characters move deeper and deeper into Norman Bates's mansion. The next-to-last shot of the film shows Norman sitting against a blank white wall, while we hear his interior monologue **(5.168).** The camera again moves forward into a close-up of his face **(5.169).** This shot is the climax of the forward movement initiated at the start of the film; the film has traced a movement into Norman's mind. Another film that relies heavily on a pattern of forward, penetrating movements is *Citizen Kane,* which depicts the same drive toward the revelation of a character's secret.

The filmmaker can develop other sorts of patterns. In Michael Snow's ↔ (usually called *Back and Forth*), the constant panning to and fro across a classroom, Ping-Pong fashion, determines the basic formal pattern of the film. It comes as a surprise when, near the very end, the movement suddenly becomes a repeated tilting up and down. As with lighting, color, and other techniques, cinematographic choices can develop in the course of the movie.

CREATIVE DECISIONS

Mobile Framing and Film Form in Grand Illusion *and* Wavelength

Two quite different films let us sum up ways in which the director can integrate the mobile frame into an overall form. One film uses the mobile frame in order to strengthen and support the plot's presentation of the story. The other film explores frame mobility in its own right and makes storytelling secondary—in fact, nearly nonexistent.

Jean Renoir's *Grand Illusion* is a war film in which we almost never see the war. Heroic charges and doomed battalions, the staple of the genre, are absent. World War I remains obstinately offscreen. Instead, Renoir concentrates on life in a German prisoner-of-war camp to suggest how relations between nations and social
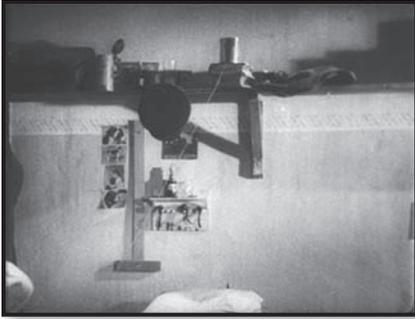
5.170 A can used as a warning signal is sitting on a shelf.

5.171 It's pulled over, but it lands on a pillow and so makes no sound.

5.172 The camera pans left to reveal that the characters haven't noticed it.

5.170–5.172 *Grand Illusion*: Unrestricted narration.

classes are affected by war. The prisoners Maréchal and Boeldieu are both French; Rauffenstein is a German officer. Yet the aristocrat Boeldieu has more in common with Rauffenstein than with the mechanic Maréchal.

The film's plot traces the death of the Boeldieu-Rauffenstein upper class and the precarious survival of Maréchal and his pal Rosenthal. They escape the camp and take refuge in Elsa's farm, where they enjoy an interlude of peace. Eventually, however, they must flee across the border, back to France and presumably back to the war.

Within this plot, Renoir has given camera movement several functions, all directly supportive of the narrative. As we might expect, the camera will often follow the figures to keep our attention on them. The camera tracks with Maréchal and Rosenthal walking together after their escape; it tracks back when the prisoners are drawn to the window by the sound of marching Germans below. But the camera movements *independent* of character action make the film more unusual.

When the camera moves on its own in *Grand Illusion,* we are conscious of it actively interpreting the action, creating suspense or giving us information that the characters don't have. In one scene, a prisoner is digging in an escape tunnel and tugs a string signaling that he needs to be pulled out **(5.170).** An independent camera movement builds suspense by showing that the other characters have missed the signal and do not realize that he is suffocating **(5.171, 5.172).** Here camera movement creates a somewhat unrestricted narration.

The independent camera movements in *Grand Illusion* sometimes become motifs. For example, camera movements repeatedly link characters with details of their environment. Often a sequence begins with a close-up of some detail, and the camera draws back to anchor this detail in its larger context **(5.173, 5.174).** More complicated is the scene of the Christmas celebration at Elsa's that begins with a close-up of the crèche and tracks back to show, in several stages, the interplay of reactions among the characters.

Such camera movements are not simply decoration; beginning on a scenic detail before moving to the larger context makes story points economically. The opening detail not only establishes a new locale but highlights a thematic point, as with the squirrel cage. So does a track-in to a detail at the *end* of a scene, as when after Boeldieu's death, Rauffenstein cuts the geranium, the one flower in the prison **(5.175, 5.176).** Other directors would have emphasized the detail by cutting to a close-up, but Renoir keeps the film's style consistent by using a camera movement.

Characters are tied to their environment by even more ambitious moving-camera shots. These stress important narrative parallels. For example, tracking shots compare actions in two officers' bars—one French **(5.177–5.179),** one German **(5.180–5.182).** Through his camera movements, Renoir indicates a similarity between the two warring sides, blurring their national differences and stressing common desires.

5.173–5.176 Tracking shots and details of setting in *Grand Illusion* ▶

5.173 Renoir begins the scene by framing a close-up of a caged squirrel.

5.174 Creating a narrative parallel, the camera tracks back to reveal Boeldieu and Maréchal discussing their escape plans.

5.177–5.182 Parallel camera movements in *Grand Illusion* ▼

5.175 As Rauffenstein moves to the geranium in the window . . .

5.176 . . . Renoir tracks in to a close shot of the flower as he cuts it. Earlier Boeldieu had admired the geranium.

5.177 In the first scene, as Maréchal leaves the French officers' bar . . .
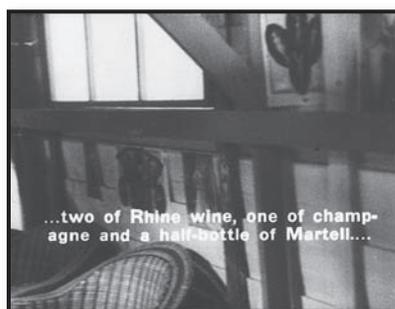

5.178 . . . Renoir pans and tracks left from the door to reveal pin-ups (just coming into the frame at the right) . . .

5.179 . . . and a poster.

5.180 One scene later, in the German officers' bar, a similar camera movement, this time toward the right, leaves the characters . . .

5.181 . . . and explores on its own . . .

5.182 . . . discovering some similar decorations.

5.183 One of the most elaborate camera movements in the film starts on a crucifix.

5.184 The camera tilts down to a military portrait on an altar, underlining the irony of a chapel commandeered as an officer's quarters.

5.185 The camera tracks past whips, spurs, and swords . . .

5.186 . . . to an orderly who is preparing Rauffenstein's gloves.

5.187 The orderly then walks away from the camera to close a window before returning . . .

5.188 . . . to the foreground. The camera pans left and tracks back to reveal . . .

5.189 . . . a tidy table . . .

5.190 . . . at which Rauffenstein is revealed to be sitting, ready for breakfast. For aristocratic warriors, the comforts of home aren't interrupted by war.

5.183–5.190 Prison camp: Military elegance in *Grand Illusion.*

Or consider how two moments of camera movement compare the war of the aristocrats and the war of the lower-class people. We are introduced to Rauffenstein's new position as commander of a POW camp through a lengthy tracking shot **(5.183–5.190).** During this movement, Renoir presents, wordlessly, the military mystique of grace on the battlefield that characterizes the aristocrat's war. Late in the film, however, a parallel shot criticizes this one **(5.191–5.193).** Elsa's war has none of Rauffenstein's glory, and our sense of that is conveyed chiefly through a parallel created by the repeated camera movement. Moreover, these camera movements work together with mise-en-scene, as the narrative

parallel is reinforced by the subtle use of objects as motifs—the crucifixes in 5.183 and 5.193, the photographs in 5.184 and 5.191, and the tables that end both shots.

Moving the camera independently also links characters with one another. Again and again in the POW camp, the camera shifts to join one man to his comrades, spatially indicating their shared condition. As the prisoners ransack the collection of women's clothes, one man decides to dress up in them. When he appears in drag, a stillness falls over the men. Renoir tracks silently over the prisoners' faces, each one registering a reticent longing for a world they have left behind.

A more elaborate linking movement occurs in the scene of the prison vaudeville show, when the men learn that the French have recaptured a city. Renoir presents the shot as a celebration of spatial unity, with the camera moving among the men as they begin defiantly to sing the "Marseillaise" **(5.194–5.200).** This complex camera movement circulates freely among the prisoners, suggesting their patriotic courage and unified defiance of their captors.

In Elsa's cottage as well, camera movement links characters. After feeding a cow, Maréchal enters the house, and a pan with him reveals Elsa scrubbing the floor. The culmination of the linking movements comes near the film's end, when Renoir pans from the Germans on one side of the border **(5.201)** to the distant French escapees on the other **(5.202, 5.203).** Even on this scale, Renoir's camera refuses to honor national divisions.

The French film critic André Bazin remarked: "Jean Renoir found a way to reveal the hidden meaning of people and things without destroying the unity that is natural to them." Renoir's precisely choreographed camera movements go beyond simply enabling us to grasp the story. By providing information at a certain pace, by placing emphasis and by making comparisons, the mobile frame in *Grand Illusion* becomes as important as the mise-en-scene.

Michael Snow's experimental film *Wavelength* gives the mobile frame a different role. Instead of helping us construct a story, the camera style blocks that effort. Instead Snow asks us to concentrate our attention on how frame mobility creates patterns in its own right. Like Gehr's *Serene Velocity* (p. 172), the film becomes an experiment in cinematography.

The film begins with a long-shot framing of a loft apartment, facing one wall and window **(5.204).** The camera zooms in abruptly a short distance and then holds that framing. It zooms in a bit more and then holds that **(5.205).** And so it goes throughout the film's 45-minute length. By the end, a photograph of ocean waves on the distant wall fills the frame in close-up.

Wavelength is structured primarily around a single kind of frame mobility, the zoom-in. The film's progression concentrates on how changing lens lengths transforms the space of the loft. The sudden zooms create frequent abrupt shifts of perspective. In excluding parts of the room, the zoom-in also magnifies and flattens what we see; every change of focal length gives us a new set of spatial relations. As the film goes on, the zoom pushes more and more space offscreen. The sound track, for the most part, reinforces the basic formal development by emitting a single humming tone that rises consistently in pitch as the zoom magnifies the space.

Within *Wavelength*'s overall form, though, there are two contrasting patterns. The first is a series of filtered tints that play across the image as abstract fields of color. These tints often work against the depth represented in the shot of the loft. A second pattern suggests a sketchy narrative. At various intervals, characters enter the loft and talk, listen to the radio, make phone calls, and perform other ordinary actions. There's even a mysterious death: A body is glimpsed on the floor **(5.206).** But these events remain unexplained in cause-effect terms and inconclusive (although at the film's end we do hear a sound that resembles a police siren). Furthermore, none of these actions swerves the mobile framing from its predetermined course. The jerkily shifting and halting zoom continues, even when it frames out important narrative information. *Wavelength* pulls in bits and pieces of narrative action, but they remain secondary; they're less important than the progression of the zoom.

5.191 This shot, set inside Elsa's farmhouse, also begins on an object, a photograph of her dead husband.

5.192 The camera tracks left past Elsa, who remarks, "Now the table is too large."

5.193 The camera continues, revealing the kitchen table, where her daughter sits alone. The chairs upended on the table reinforce the solitude of Elsa's life in the midst of war.

5.191–5.193 Farmhouse: War's cost in *Grand Illusion.*

5.194 As the lead "female" singer whips off his wig and requests the "Marseillaise" from the musicians . . .

5.195 . . . the camera moves right and the singer turns toward the audience.

5.196 The camera tracks farther right as others onstage sing along.

5.197 A tilt down shows two worried German guards in the foreground.

5.198 A track back to the left reveals a row of French prisoners in the audience on their feet, singing.

5.199 The camera tracks forward past them to the musicians and singer again . . .

5.200 . . . then pans quickly left to reveal the assembled prisoners again, this time declaring their patriotism directly to the camera.

5.194–5.200 *Grand Illusion*: Camera movement as prisoner solidarity.

As an experimental film, *Wavelength*'s use of frame mobility arouses, delays, and gratifies unusual expectations. The fragmentary plot briefly arouses curiosity (What are the people up to? What has led to the man's death, if he does die?) and surprise (the apparent murder). But in general, a story-centered suspense is replaced by a *stylistic* suspense. The zoom is the only sign of development, so we're curious about what it will eventually reveal.

Yet the revelation is delayed by the colored tints, the bits of plot, and the spasmodic qualities of the zoom itself. When the zoom finally reveals its target, our stylistic anticipations find fulfillment. The film's title stands revealed as a multiple pun, referring not only to the steadily rising pitch of the sound track but also to the distance that the zoom had to cross in order to reveal the photo—a "wave length."

5.201 The Germans realize that Maréchal and Rosenthal have crossed over into Switzerland.

5.202 Renoir pans to the right across the invisible border . . .
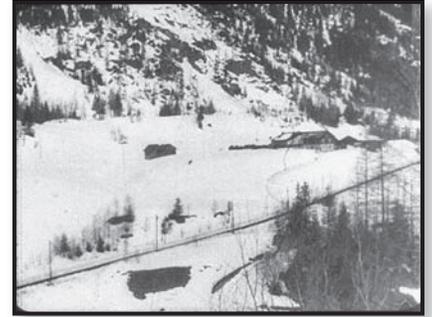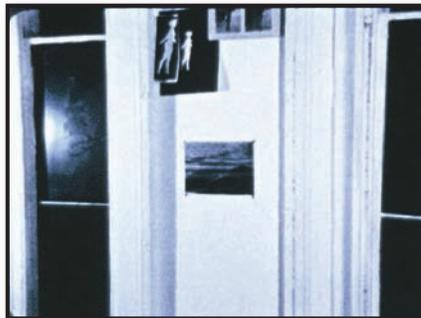
5.203 . . . to reveal the two escapees, tiny dots in the huge landscape.

5.201–5.203 Border crossing in *Grand Illusion*.

5.204

5.205

5.206

5.204–5.206 The spasmodic space of *Wavelength.* Early in the film, much of the apartment is visible (5.204). Near the end, the abrupt zoom-ins have made the distant wall visible (5.205). A fallen body can be glimpsed at the bottom of the frame, but the zoom-ins will soon eliminate it from the frame (5.206).

This revelation is secondary to the experience of watching the halting zoom change the space of the room, and watching a stylistic pattern curb our narrative appetite.

Grand Illusion and *Wavelength* illustrate, in different ways, how frame mobility can shape our perception of a film's space and time. Renoir motivated his style of frame mobility by narrative form, while Snow made the technique the principal formal concern, motivating other aspects of the film.

Duration of the Image: The Long Take

Throughout this chapter, we've seen that the decisions that filmmakers make about cinematography affect both space and time. The range of photographic tonalities, the shot's perspective relations, and the position of the camera are largely matters of space. But other possibilities, like speed of motion and mobile framing, have consequences for time too. The last area of choice and control we consider involves time in an especially intriguing way.

One popular YouTube genre is the so-called lipdub, in which a group of performers, usually students, lip-sync a pop song. Usually these videos feature lengthy camera movements within a single shot. There is a certain pride in choreographing all the "singers" with the moving camera in the two or three minutes that the song takes. Cutting would be easier, but there'd be less sense of virtuosity, less of a wow factor.

The lipdub phenomenon reflects one constant factor across the history of film art: the idea that there's something to be gained by letting a shot run long. But how

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We connect the video genre of the lipdub to traditions of long-take filming in "2-4-6-8, whose lipdub do we appreciate?"

5.207

5.208

5.207–5.208 Compressing screen duration within a single shot. A shot in *The Only Son* moves from night (5.207) to morning (5.208).

long, and why? Jean-Luc Godard asks the question explicitly. "The only great problem with cinema seems to me, more and more with each film, when and why to start a shot and when and why to end it." What guides a director in deciding how long to let a shot last?

Real Time Is . . . What?

When people talk about filming something in "real time," they often imply that the shot is recording actual duration. Usually it is. If we film a runner taking three seconds to clear a hurdle, our projected film will typically consume three seconds. But the film-maker can choose to override real duration. As we've already seen, screen duration can be manipulated through slow or fast motion. Less obviously, narrative films don't always let us equate screen duration with story duration, even within a single shot.

As Chapter 3 pointed out (p. 80), story duration usually differs from plot duration, and both are affected by film techniques that shape screen time. You can compress story duration within a single shot. Here's an example from Yasujiro Ozu's *The Only Son*.

It is well past midnight, and we have just seen a family awake and talking. The shot shows a dim corner of the family's apartment, but eventually the light changes. By the end of the shot, morning has come **(5.207, 5.208)**. This transitional shot consumes about a minute of screen time, but that plainly isn't the "real time" of the story action. The story action takes at least five hours. Thanks to cues of lighting, setting, and sound, the sustained shot has condensed a story duration of several hours into a minute or so on the screen.

Other films use tracking movements to compress longer passages of time in a continuous shot. This sort of condensation has become easier with digital postproduction **(5.209, 5.210)**. The final shot of *Signs* moves away from an autumn view through a window and through a room, to reveal a winter landscape outside another window. Months of story time have passed during the tracking movement.

Functions of the Long Take

We can ask Godard's question a different way: How long should a shot last? Shot durations have varied somewhat over history. Early cinema (1895–1905) tended to rely on fairly lengthy shots, since each film often consisted of only one shot. With the emergence of continuity editing in the period 1905–1916, shots became shorter. From the late 1910s to the early 1920s, an American film would have an average shot length of about 5 seconds. After the coming of sound, the average stretched to about 10 seconds. But in the mid-1930s, directors in several countries began to experiment with very lengthy shots. The intricate camera movements in *Grand Illusion,* from 1935, are good examples. Renoir and his peers showed that unusually lengthy shots—**long takes,** as they're called—represented a powerful creative resource.

A *long take* is not the same as a *long shot,* which refers to the apparent distance between camera and object. As we saw in examining film production (pp. 22–23),

5.209

5.210

5.209–5.210 Camera movement through the seasons. In Roger Michell's *Notting Hill,* the protagonist's walk through the Portobello street market moves through autumn (5.209), then winter (5.210). Eventually the shot ends with spring.

a *take* is one run of the camera that records a single shot. To prevent ambiguity, we call a protracted shot a long take rather than a long shot.

In the films of Jean Renoir, Kenji Mizoguchi, Orson Welles, Carl Dreyer, Miklós Jancsó, Hou Hsiao-hsien, and Bèla Tarr, a shot may go on for several minutes. One shot in Andy Warhol's *My Hustler* runs for about 30 minutes and constitutes much of the film's second half **(5.211)**. It would be impossible to appreciate the artistry of these films without considering what the long take contributes to form and style.

Usually, we can regard the long take as an alternative to a series of shots. The director may choose between presenting a scene in long takes and presenting it in several shorter shots. When an entire scene is rendered in only one shot, the long take is sometimes called a *sequence shot,* a translation of the French term *plan-séquence.* In any film, most filmmakers mix edited scenes with scenes handled in long takes. This allows the filmmaker to bring out specific values in particular scenes, or to associate certain aspects of narrative or nonnarrative form with the different stylistic options.

A vivid instance occurs in Steve McQueen's *Hunger,* based on a hunger strike in a prison in Northern Ireland. Most of the scenes, including violent confrontations between prisoners and guards, consist of several shots. At this point, Bobby Sands, the main character, seems only one prisoner among many. Roughly halfway through the film, the plot starts to focus on him and we begin to understand his motives and plans. The key scene begins with a shot lasting nearly 18 minutes, a balanced view of Sands and an old friend who visits him **(5.212)**. There is no camera movement. The effect is to rivet the viewer on the character's dialogue during a turning point in the action.

Alternatively, the filmmaker may decide to build the entire film out of long takes. Hitchcock's *Rope* is famous for containing only 11 shots, most running between 4 and 10 minutes. Similarly, each scene in *Winterwind, Red Psalm,* and other films by Miklós Jancsó consists of a single shot. In such cases, the long take becomes a large-scale part of a film.

In a long-take movie, editing can have great force. After a seven- or eight-minute shot, an elliptical cut can prove quite disorienting. Gus van Sant's *Elephant* traces events around a high school shooting rampage, and it presents most scenes in very long takes following students through the hallways. Moreover, *Elephant*'s plot doesn't present the events in chronological order. The narration flashes back to show other school days, the boys' lives at home, and their preparations for the killings. So when a cut interrupts a long take, the audience must reflect for a moment to determine how the new shot fits into story chronology. The effect of the editing is unusually harsh, because the cuts tend to break the smooth rhythm of the sustained traveling shots **(5.213–5.215)**.

Could a feature-length movie consist of one long take? Many directors have dreamed of it, but the lengths of film reels were a constraint. A 35mm camera reel typically runs for only 11 minutes, so Hitchcock sought to hide some of *Rope*'s obligatory cuts. Extended 16mm reels of the type Warhol used in *My Hustler* (5.211) can run up to 30 minutes. With digital video, however, it is possible to shoot for hours on a single tape or file, and the Russian director Aleksander Sokurov seized this opportunity in *Russian Ark.* The film consists of a single shot nearly 90 minutes long, as the camera follows over 2,000 actors in period costume through St. Petersburg's immense Winter Palace. *Russian Ark* takes us through several eras of Russian history, culminating in a stupendous ballroom dance and a crowd drifting off into a wintry night **(5.216–5.218)**.

Thanks to digital postproduction, a long take can be even longer. Software can blend shots undetectably, so that *Birdman; Or, The Unexpected Virtue of Ignorance* could present an apparently continuous shot that lasts over 100 minutes on the screen.
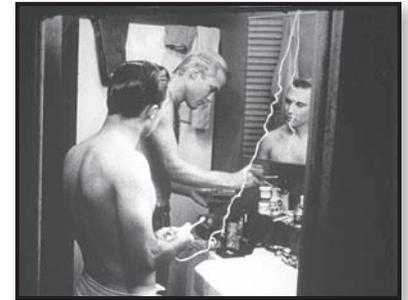
5.211 The long take and narrative form. A long take in *My Hustler* captures the seductive exchange of two gay men as they groom themselves in a bathroom.

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Both *There Will Be Blood* and *The Most Beautiful* contain subtle staging in two unmoving long takes. We compare them in "Hands (and faces) across the table."

5.212 The long take to mark a turning point. Backlighting and a lengthy, static shot in *Hunger* place us at a distance from Bobby Sands and his visitor. The director's stylistic choice allows us to concentrate on their words, which provide important exposition about the planned hunger strike.

5.213

5.214

5.215

5.213–5.215 Discontinuous editing interrupts a long take. In a shot lasting two minutes, the camera follows Michelle into the library, where she starts reshelving books (5.123). Many of the long takes in *Elephant* frame the walking characters from behind. This conceals their facial expressions from us and emphasizes the school environment. Michelle turns as we hear a rifle being cocked (5.214). We expect a reverse shot to reveal the shooter. Instead, we get a flashback to earlier that day when the two boys showered together before going to school on their deadly mission (5.215).

5.216

5.217

5.216–5.218 *Russian Ark* and the long take. In *Russian Ark,* one episode takes place in the palace theater, with Catherine the Great pronouncing the rehearsal satisfactory (5.216). An hour or so later, still within the same shot, hundreds of aristocrats and officers descend a staircase toward the impending devastation of the Russian Revolution (5.217). Crew members moved through the Hermitage Museum, filming with a digital camera mounted on a Steadicam (5.218). Sokurov rehearsed *Russian Ark* for several months and completed the take used in the film on the fourth try. Today, a shot like this could be assembled out of several takes blended in postproduction, as in *Snake Eyes* or *Birdman.*

5.218

The Long Take and the Mobile Frame

The static long take in *Hunger* is unusual; most long takes, like those in *Elephant, Russian Ark,* and *Birdman* (and in DIY lipdubs), rely on camera movement. Panning, tracking, craning, or zooming can be used to present continually changing vantage points that are comparable in some ways to the shifts of view supplied by editing.

5.219 The long take begins with Omocha and the businessman seated. The camera follows her as . . .

5.220 . . . she moves to the opposite end of the room . . .

5.221 . . . and sits at a small table facing him.

5.222 A second phase of the shot begins as she begins to appeal to his sympathy and he moves to the table . . .

5.223 . . . and sits down to console her.

5.224 Finally, the camera moves into a tighter shot as she sits beside him and he succumbs to her advances.

5.219–5.224 *Sisters of Gion*: The long take marks stages of the action.

Very often, frame mobility breaks the long-take shot into smaller units. In Mizoguchi's *Sisters of Gion,* one long take shows a young woman, Omocha, luring a businessman into becoming her patron **(5.219–5.224).** Though there is no cutting, the camera and figure movements demarcate important stages of the scene's action.

As in this example, long takes tend to be framed in medium or long shots rather than close-ups. The camera takes us through a fairly dense visual field, and the spectator has more opportunity to scan the shot for particular points of interest. This is recognized by Steven Spielberg, a director who has occasionally exploited lengthy takes:

> I'd love to see directors start trusting the audience to be the film editor with their eyes, the way you are sometimes with a stage play, where the audience selects who they would choose to look at while a scene is being played. . . . There's so much cutting and so many close-ups being shot today I think directly as an influence from television.

As we saw in the previous chapter, the arrangement of the mise-en-scene can guide our scanning of the frame. Accordingly, a director may choose to put editing aside and let a gradually unfolding long take steer us from one information-packed frame to another. This is what happens in *Sisters of Gion*, as the camera movement follows Omocha's seduction of the businessman.

The example from *Sisters of Gion* illustrates another important feature of the long take. Mizoguchi's shot reveals a complete internal logic—a beginning, middle, and end. As part of a film, the long take can have its own formal pattern, its own development, its own trajectory and shape. Suspense may develop; we start to ask how the shot will continue and when it will end.

The classic example of how the long take can constitute a formal pattern in its own right is the opening sequence of Welles's *Touch of Evil* **(5.225–5.236).** This opening shot makes plain some basic features of the long take. It offers an

Mizoguchi, a master of staging, became famous for his elegant long takes. We consider his style in "Mizoguchi: Secrets of the exquisite image."

5.225 The opening shot begins with a close-up of a hand setting the timer of a bomb.

5.226 The camera tracks immediately right to follow first the shadow . . .

5.227 . . . and then the figure of an unknown assassin planting the bomb in a car.

5.228 The camera then cranes up to a high angle as the assassin flees and the victims arrive and set out in the car.

5.229 As the camera rounds the corner, it rejoins the car. A reverse tracking shot keeps it in frame.

5.230 The car passes Vargas and his wife, Susan, and the camera starts to follow them, losing the car and tracking diagonally backward with the couple through the crowd.

5.231 The camera tracks backward until both the occupants of the car and Susan and Vargas meet again.

5.232 The camera remains in one place to let the brief scene with the border guard play out.

5.233 After tracking left with the car, the camera catches up with Susan and Vargas and tracks forward toward them . . .

5.234 . . . bringing them into medium shot as they begin to kiss.

5.235 Their embrace is interrupted by the offscreen sound of an explosion, and they turn to look leftward.

5.236 The next shot zooms in to show the car in flames.

5.225–5.236 *Touch of Evil*: The virtuoso moving long take.

alternative to building the sequence out of many shots, and it stresses the cut that finally comes (occurring at the sound of the explosion of the car).

The shot has its own internal pattern of development. We expect that the bomb shown at the beginning will explode at some point, and we wait for that explosion through the long take. The shot establishes the geography of the scene, the border between Mexico and the United States. The camera movement, alternately picking up the car and the walking couple, weaves together two lines of narrative cause and effect that intersect at the border station. Vargas and Susan are thus drawn into the action involving the bombing. Our expectation is fulfilled when the end of the shot coincides with the explosion (offscreen) of the bomb. The shot has guided our response by taking us through a suspenseful development.

The long take can present, in a single chunk of time, a complex pattern of events moving toward a goal, and this ability shows that shot duration can be as important to the image as photographic qualities and framing are.

SUMMARY

The film shot is a complex unit. By controlling mise-en-scene, the filmmaker fills the image with material, arranging setting, lighting, costume, and staging within the formal context of the total film. Similarly, the shot is shaped by the cinematographic options we've been examining.

Those options bear on photographic qualities: tonality, speed of motion, and the varieties of perspective created by lens lengths, depth of field, and special effects. The filmmaker can also reckon in the aspect ratio and decide how the image is framed. Other creative choices involve varying camera placement—the angle, level, height, and distance at which we see the subject. The filmmaker can decide to move the frame in a host of ways, and can choose to exploit the long take with or without camera movement.

The array of choices is dazzling, and as with mise-en-scene, decision making is at the center of film artistry. Forced to choose one way or another, the filmmaker pursues options that will give the viewer a specific experience—and perhaps also challenge the filmmaker's skills. In turn, the choices that are made can coalesce into a pattern, the style of that particular film.

You can sensitize yourself to cinematographic options in much the same way that you worked on mise-en-scene. Trace the progress of a single technique, such as camera distance, through an entire scene. Notice when a shot begins and ends, observing how a long take may function to shape the film's form. Watch for camera movements, especially those that follow the action (since those are usually the hardest to notice). Once you notice cinematographic qualities, you can move to an understanding of their various functions within the sequence and the film as a whole.

Film art offers still other possibilities for choice and control. Chapter 4 and this chapter focused on the shot. The filmmaker may also juxtapose one shot with another through editing, and that's the subject of Chapter 6.