Chapter 3:
The Shot: Cinematography

In Chapter 2, you began the process of learning about the stylistic formal system in film by becoming familiar with the first consideration involved in the shot: Mise-en-Scène. But **the shot** is about more than that which is placed inside the frame. It is also about *how* that frame – indeed, how all frames in the film – are captured so that they can be shared with an audience. On one level, the answer to the question of how frames are captured is quite simple: they're captured by the camera. Cinematography is, simply, everything related to the use of the camera. On another level, of course, the answer is complex and sophisticated – which brings us to our second major element of a film's stylistic form:

- Mise-en-Scène
- **Cinematography**
- Editing
- Sound

The word "cinematography" comes from the Greek roots *kinema*, meaning "motion," and *graphia*, meaning "to describe" or "to write." So **cinematography** translates literally as *writing or describing in motion*. This makes perfect sense when you think about what film is: a series of pictures projected in such a way that what they describe (or "write") is the illusion of motion. This understanding of what films actually are explains the name early filmmakers adopted for their creation: *moving pictures* – which of course was later shortened to the term most often used to refer to film today, *movies*.

As you learned in Chapter 1, the **cinematographer** is responsible for all aspects of the filmmaking process related to the use of the camera. These aspects include choice of materials, composition, light & color, framing, movement, and duration.

The Cinematographer's Raw Materials

At its simplest, the cinematographer's raw material comprises a series of still photographs that are recorded ("shot") and then projected at a rate sufficient to fool the human eye into thinking that it is perceiving actual motion. This rate – in film, it's generally 24 frames per second – is referred to as **critical flicker fusion**[1], and the trick that it plays on our eyes is called **persistence of vision**. The process is actually quite simple: the camera shoots the action at a rate of 24 frames every second; later, when the final product has been assembled, the frames are projected at the same rate

[1] Also known as the *phi phenomenon.*

at which they were shot, with very brief projections of black between each frame.[2] If you've ever watched a film from the 1920s or 1930s that appears jumpy and "speeded up," that's likely a result of the fact that those early films were often shot at a rate of 16 frames per second rather than 24, but they're projected at the modern rate of 24. When this happens, the action appears to be happening at a rate roughly 1.5 times its actual speed.[3]

Aside from the most basic of materials – lots and lots of photographs[4] – the cinematographer has several other basic materials to work with as well, most of them having to do with the camera itself as well as the film the camera uses.[5] Film cameras can make use of a variety of lenses, which affect the framing of the shot – and for this reason, lenses will be discussed in the framing section later in this chapter. Regardless of the specific lens used, though, cinematographers can also add to those lenses in order to affect the overall visual feel of the shot. Specifically, cinematographers employ **filters** to manipulate exposure (the amount of light allowed in through the camera's aperture) and **gels** to manipulate the color-feel of the shot. See if you can spot the differences in exposure and color achieved through filters and gels in these shots from George Roy Hill's *Butch Cassidy and the Sundance Kid*.

[2] In the early days of film, cinematographers and projectionists didn't realize that they could create a smoother persistence of vision by inserting the black frames, so those early films had a rather jumpy, flickering feel – which is why early movie fans referred to films as "flicks." True story.

[3] And in case you're curious about why filmmakers switched from shooting 16 fps to shooting 24 fps – it's because the human eye can still detect individual images at a rate of 12, 13, even 14 frames per second . . . which means that film shot at 16 fps will only *barely* achieve critical flicker fusion for some viewers.

[4] The word "photography," also from the Greek, means "writing in light" – which makes sense, right?

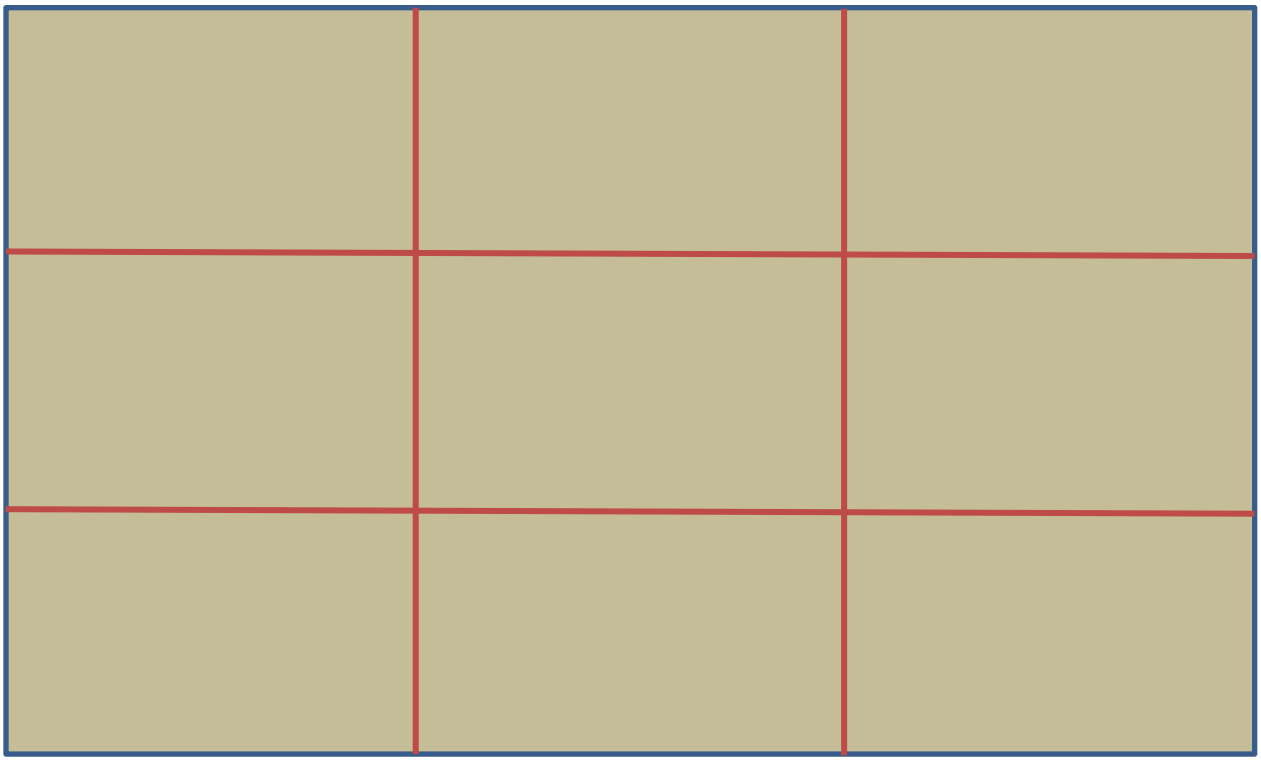
[5] In general in this chapter, we're talking about actual film-camera cinematography – you know, celluloid. Today more and more films are shot using digital video, which means that some of what we're discussing in this section (exposure, filters, etc.) doesn't really apply, at least not in the shooting stage. The effects achieved by various lenses and film stocks are achieved, in digitally-shot films, in the computer.

Beyond the above elements that are applied to the lens, the choice of film is another important consideration for the cinematographer. **Film stocks** (types of actual, physical film) are classified in the most basic of ways (**color** vs. **black and white**, for example) as well as in more sophisticated ways, such as their responsivity – or speed – which is determined by its sensitivity to light. **Film speed** determines the range of light conditions (night, natural sunlight, various artificial sources) under which the film can be used effectively. The photos below demonstrate the use of different film stocks within a single film – Christopher Nolan's *Memento*.

A final consideration in the selection of film stocks is the **gauge** of the film – in layman's terms, this is the width of the actual film. In general, the wider the gauge, the richer the image. Early films were shot with 8 or 16 millimeter gauge, while most Hollywood feature films of the last several decades have been shot in 35 mm. Some films – particularly the big, visually-striking epics of the 1960s such as David Lean's *Lawrence of Arabia* and Stanley Kubrick's *2001: A Space Odyssey*, are shot in 70 mm. Since 2002, an additional option for filmmakers who want to make big films with the greatest possible image resolution is the film format known as IMAX.

Composition

Composition is one element of cinematography that might feel at first as if it were an aspect of mise-en-scène – after all, it's essentially about what's seen in the shot. But whereas mise-en-scène is about the *what* of the shot (what are we seeing?), cinematographic composition is about the *where* and the *how* of the shot – where do elements appear within the frame, and how, aside from the original recorded shot, is the content composed? One general rule when a cinematographer is composing the shot is the **rule of thirds**, which values ***asymmetry over symmetry***. Imagine that the shot is divided into sectors by delineating both the height and the width of the frame into thirds like the diagram below. The cinematographer will make the effort to compose each shot in such a way that the focal point (in a shot with a single focal point) appears somewhere other than the center rectangle – in other words, that the focal point appears in the right-hand third of the frame or the left-hand third of the frame – or, if it's in the center rather than left or right, it will appear in the upper third or the lower third of the frame. In a shot with more than one focal point, the cinematographer will make the effort to place both elements in such a way that their weight tends toward left or right, top or bottom, rather than anchoring the center of the shot.



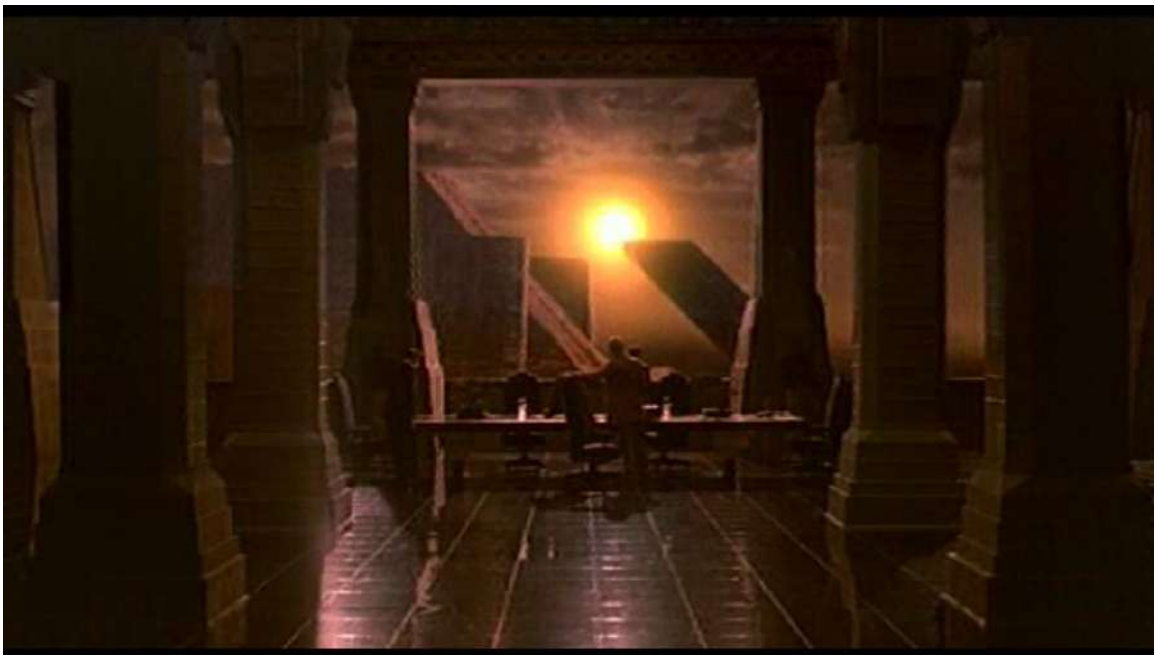
In the shot below, from Francis Ford Coppola's *Godfather II,* the focal point – the face of Michael Corleone (Al Pacino) is almost dead-center on the horizontal (left-right) axis, but is in the upper third of the vertical axis, thus following the rule of thirds.

In the next shot, from the same film, there are many figures but arguably two focal points: the face of Michael (Al Pacino) and the back of the head of Fredo (John Cazale). Both focal points are placed in the upper right quarter of the frame – the center and right segments on the horizontal axis, and the upper and center segments on the vertical axis. The secondary figures to the left and the far right help to offset the weight of the dual focal point, but they aren't significant enough to truly balance the composition – which means that the shot still achieves asymmetry by obeying the rule of thirds.

The rule of thirds is the *where* aspect of cinematographic composition. The *how* aspect – how the content is composed, beyond the original recorded material – involves several techniques. The first of these is the **glass shot**, in which the action is shot through a pane of glass that has been painted black in areas where a created background will be spliced in later. The shot below, from *The Wizard of Oz*, involves glass shot technology for the Munchkinland backgrounds.

Another early method of composing the multi-sourced shot is **superimposition**: recording two separate shots live and then combining the two shots by laying them atop one another (superimposing them) and fading both just enough so that both images can clearly be seen, as in this shot from *Citizen Kane*.

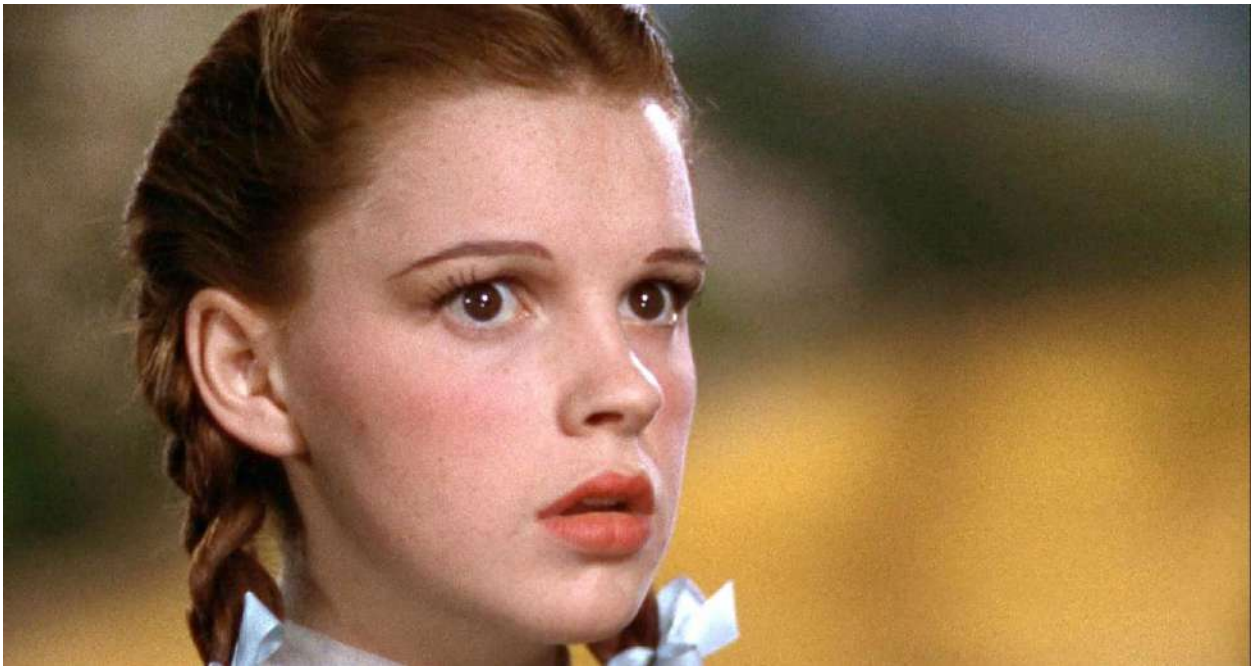
A more modern version of the glass shot is known as **matte compositing** – essentially the same technique, but instead of shooting through painted glass, the filmmakers combine live footage with computer-generated segments of the shot to create a unified whole, as in this shot – with live interior and CGI view out the window – from Ridley Scott's *Blade Runner*.



Yet another variation on the glass shot or matte compositing is **projection compositing** – which you may have heard referred to as blue-screen or green-screen shooting. In projection compositing, live action (or a model sequence) is shot in front of a monochromatic screen (typically blue or green) and then previously recorded or CGI footage replaces the entire screen area, thus creating a seamless melding of the two separate shots, as in this model-projection composite from *Blade Runner*.

A final area of consideration in composing the shot is **focal emphasis**. What is in the shot and how it's comprised is one thing – another thing is which element(s) within the shot are brought to our attention through decisions the cinematographer makes about focus: what is seen sharply compared to what is blurred. The eye is drawn toward the sharply-focused elements rather than those that are out of focus. In creating focal emphasis, the first thing the cinematographer considers is the camera's depth of field, the degree of focus available within a specific camera. A camera with a high depth of field can focus sharply on several planes at once, while a camera with a low depth of field can focus only on a few foreground planes with sharp definition. One of the reasons that *Citizen Kane* is considered a masterpiece of filmmaking is the very high depth of field in the cameras used by cinematographer Gregg Toland, as exemplified in this **deep-focus shot** (also presented under deep-space composition in Chapter 2).

A **shallow-focus shot**, on the other hand, is one in which only the foreground is in sharp focus while the background is blurred, as seen in this shot from *The Wizard of Oz*:



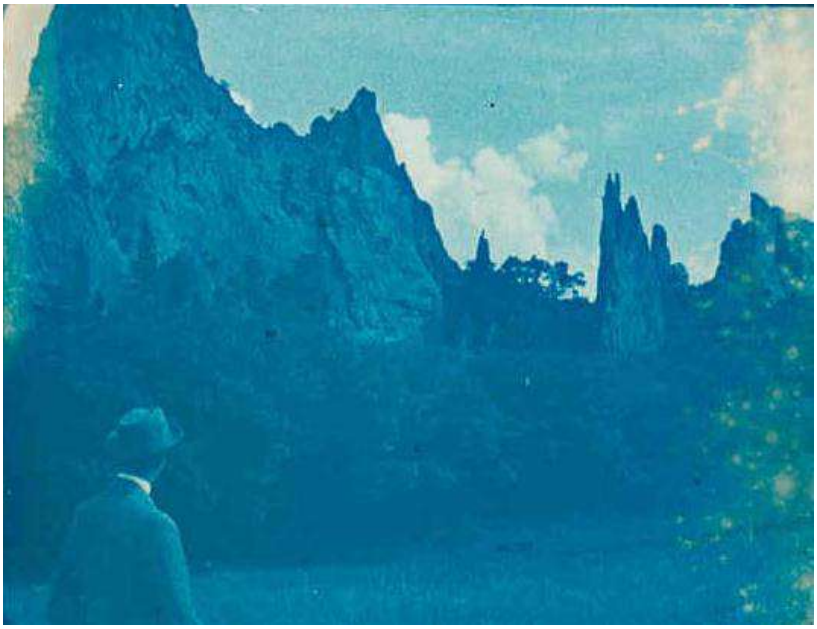
Cinematographers also have the option of **racking focus** within a shot – pulling focus from foreground to background, shifting from a shallow-focus to a deep-focus shot (or vice-versa) while the camera is running. This shot from Sam Raimi's *Spiderman*, for example, racks between shallow-focus and deep-focus, alternately emphasizing the spider web and the figures below.

Light and Color

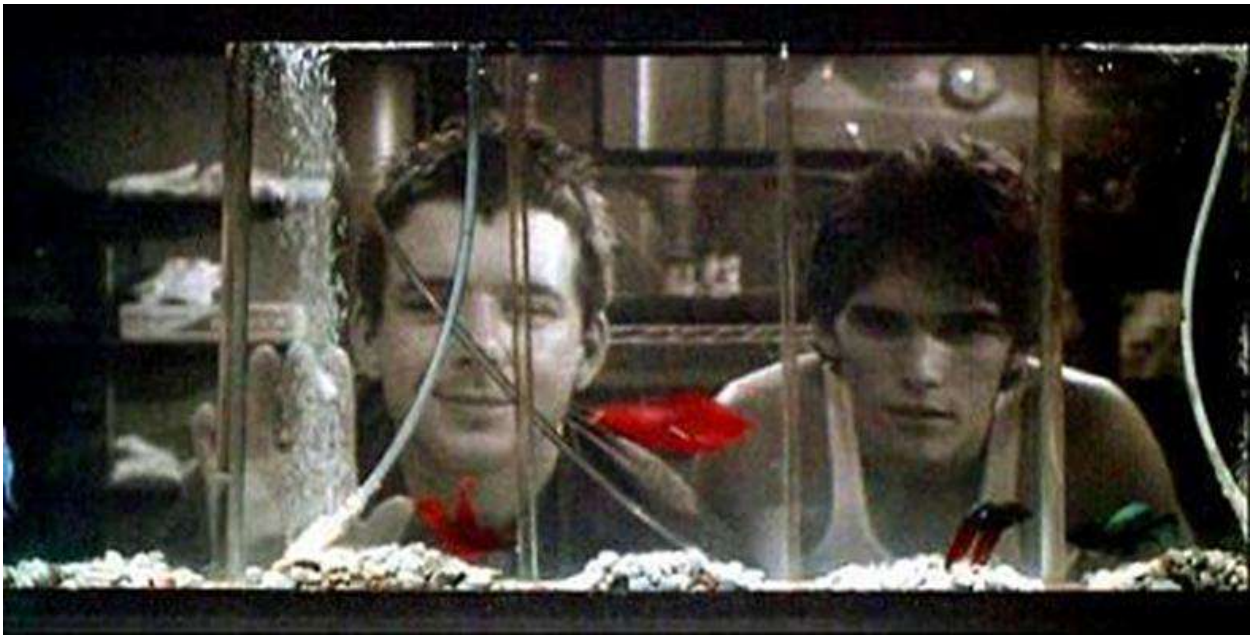
We discussed light and color in Chapter 2 because some aspects of light and color are elements of mise-en-scène – they are a function of what is *placed in the scene*. But other aspects of light and color are functions of cinematography because they are about the camera and the film. In Chapter 1, you learned about color timers and color graders, the technicians who adjust the film's consistency of color, brightness and contrast (the relationship between light and dark areas of the shot).

Sometimes, though, a cinematographer will want to achieve an effect involving color that has not been captured through the images actually shot live. The three general types of color effect are tinting, toning, and hand-coloring. **Tinting** involves dipping developed film into dye so that light areas of the developed image take on the color of the dye, as seen in this shot from F.W. Murnau's *Nosferatu*:

Toning, on the other hand, involves developing the film in dye, which colors the dark areas instead of the light areas, as seen in this shot from a very early film whose title and director have escaped your humble author:



Finally, **hand-coloring** – which is used rarely because of how painstaking and time-consuming it is – involves hand-painting individual elements within the frame, as seen in the shot below from Francis Ford Coppola's *Rumble Fish*.[6]



[6] The contemporary version of hand-coloring involves computerized selection and modification of elements within the shot, used to beautiful effect in Gary Ross' *Pleasantville.*

Framing the Shot: Size, Shape and Screen Space

The cinematographer has many decisions to make regarding the size and shape of the frame. One of the first decisions made involves the focal length of the camera lens used in capturing the shot. There are three standard focal lengths: normal, wide-angle, and telephoto. A fourth lens, the zoom, allows the camera operator to shift among these lengths while shooting. The **normal lens** captures an image that appears very similar to what the human eye sees, and the resulting shot has straight edges, as seen in this image from *Casablanca*:

A **wide-angle lens** is capable of capturing a somewhat greater width than a normal lens, which results in a shot with distorted edges – note how this shot from *Citizen Kane*, shot with a wide-angle lens, seems to curve outward at the right and left edges:

The **telephoto lens**, which is used rather rarely and typically for landscape shots, is capable of capturing great distances. This results in a flattening of planes, which makes the objects within this shot appear to be much closer together than they really are, as seen in this still photo, which collapses a great deal of distance in the San Francisco Bay:

Aside from the lens, the other major decision to be made in selecting the camera and film that will best capture the desired size and shape of the shot is the film's **aspect ratio** – the proportional relationship between the shot's width and height. A huge variety of aspect ratios are possible, but the most common are **4:3** (a.k.a. 1.33:1), the standard 20th century television format and the preferred format of early films; and **16:9** (a.k.a. 1.78:1), the standard HDTV format and the preferred format of films since the 1960s. Other aspect ratios exist as well, typically wider than those mentioned already. A representative sample of aspect ratios is presented below.

4:3 (1.33:1)
John Huston's *The Maltese Falcon*

16:9 (1.78:1)
Kenneth Branagh's *Much Ado About Nothing*

11:5 (2.20:1)
David Lean's *Lawrence of Arabia*

12:5 (2.39:1)
Michael Cimino's *The Deer Hunter*

Framing the Shot: Onscreen/Offscreen Space

Another relevant consideration in framing the shot is what's *not* viewable. Everything that the viewer sees in the shot is referred to as **onscreen space** . But often, a significant part of our filmgoing experience is an awareness of offscreen space – that is, an awareness of what is happening outside the viewable frame. There are **six zones of offscreen space**: above the frame, below the frame, to the left of the frame, to the right of the frame, in front of the frame (i.e. behind the camera) and behind the frame (i.e. behind the background). After viewing Charlie Chaplin's *City Lights*, take a look at the shot below and think about the scene it's from: how many of the six zones of offscreen space are you aware of for this shot?

Framing the Shot: Vantage Point – the Distance of the Shot

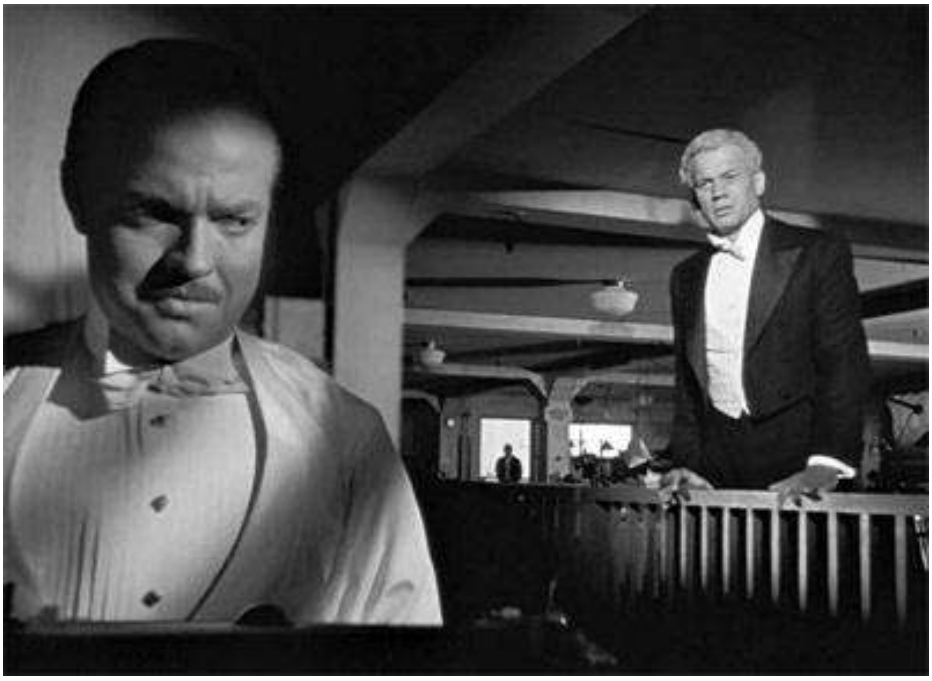
Camera distance refers to the relative distance between the camera and the focal point of the shot. There are seven gradations of camera distance: extreme long shot, long shot, medium-long shot, medium shot, medium close-up, close-up, and extreme close-up. These distances are defined based on how much is viewable of the most common focal point in film: the human figure. The following examples of various distance shots come from *Citizen Kane*.

In the **extreme long shot**, we are viewing a landscape (real or imagined), and any human figures in the shot will be seen at a great distance:

The **long shot** captures the human figure from head to toe:

The **medium-long shot** (a.k.a. the full shot or the *Plan Americain*) captures the human figure from the knees up. Note that this shot is masquerading as a long shot, but only because we focus on the figure at center, which is actually a reflection in a mirror. The image of the man himself, not in reflection, is the knees-up version at the far left:

The **medium shot** captures the human figure from the waist up. Note that the human figure in question in this shot is Kane, in the foreground, although Leland, in the background, is also framed similarly because his lower body is covered by the railing:



The **medium close-up** captures the human figure from the shoulders up:

The **close-up** captures the entire head of the human figure:

And the **extreme close-up** captures an individual feature smaller than the head (an eye, a mouth – or, in the case of this crucial shot, a hand):

Framing the Shot: Vantage Point – the Angle of the Shot

Aside from the distance that the camera is placed from its focal point, the cinematographer also considers the **angle** from which the camera records the action. The angle of the camera helps to place the viewer in the cinematographer's desired position in order to create a sense of perspective. Many shots in film are **point-of-view shots**, meaning that what the viewer sees is essentially what a character in the film is seeing, as in this shot from *Casablanca*, which shows us what Rick is seeing:

The most common angle from which the camera records is the **head-on angle**, in which the camera "looks" neither up nor down at its subject but rather is placed at the same height as the subject(s) and aimed straight at the focal point, as in this shot from *Citizen Kane*.

In an **upward-angle shot**, the camera is pivoted vertically on a horizontal axis to "look" up at its subject (again from *Citizen Kane*). Note that this angle makes the subject appear powerful and domineering in relation to whatever he's looking at (and indeed in relation to the viewer).

In a **downward-angle shot**, the camera is pivoted vertically on a horizontal axis to "look" down at its subject. This angle achieves the opposite effect from the upward-angle shot, in that the subject (Suzan Alexander Kane from *Citizen* Kane) appears vulnerable and powerless in relation to whatever she's looking at – and perhaps in relation to the viewer as well.

Finally, in a **canted-angle shot**, the camera "leans" right or left to upset the horizon line, disorienting the viewer and creating a sense of the scene being off-balance or out of control (*Citizen Kane* once again):

Camera Movement, or Mobile Framing

So far, everything we've talked about in this chapter involves the cinematographer using a camera that stays put – a camera that is fixed in a single location without moving while it shoots. But **camera movement** (a.k.a. **mobile framing**) is another important aspect of the cinematographer's art. There are five essential types of camera movement: panning, tilting, tracking, crane, and steadicam.

In a **pan shot**, the camera stays in a fixed position on its tripod or dolly, but rotates horizontally on a vertical axis, as in this shot from Steven Soderbergh's *Ocean's Eleven* (**click the image to see the video**).

In a **tilt shot**, the camera stays in a fixed position on its tripod or dolly, but rotates vertically on a horizontal axis, as in this shot from Bryan Singer's *The Usual Suspects*, in which the brief but crucial tilt occurs near the middle of the clip (**click the image to see the video**).

In a **tracking shot**, the camera is mounted on a moving vehicle that follows the subject (or is followed by the subject), as in this shot from Stanley Kubrick's *The Shining* (**click the image to see the video**).

In a **crane shot**, the camera is mounted on a crane to shoot from high above the subject, as seen in this sequence from Sam Mendes' *American Beauty* (**click the image to see the video**).

And finally, in a **Steadicam shot**, the camera is mounted via a special shock-absorbent harness to the camera operator, who can then accomplish an enhanced tracking shot, in that he or she can follow the subject (or be followed by the subject) even in places where a vehicle couldn't go – up and down stairs, for example, or through narrow doorways. The Steadicam allows maximum flexibility in the shot and is often used beautifully in the films of Martin Scorsese – like *Goodfellas* (**click the image to see the video**).

Duration of the Shot: The Take

The take is the unit of measurement used to describe a single run of the camera as edited and placed into the film. Some takes are short, some are long – some are *very* short while some are *very* long. The overall average length of the take in a typical Hollywood narrative film is somewhere around 30 seconds, although as viewers we tend to accept as "normal" anything between about 3 seconds and 3 minutes. Anything shorter than 3 seconds feels fast and anything over 3 minutes feels very slow (unless the camera is doing tricky things to fool us into thinking we're seeing multiple takes – more on this later).

Cinematographers[7] use the length of the take to accomplish a number of objectives, but the most important of these is *emotional effect*: as a general rule, the shorter the take, the more agitated or excited we feel – and the longer the take, the more lulled we feel (although long takes too can be unnerving, especially when the camera focuses on a single subject, like a face, for an unnaturally long time). Also as a general rule, you can expect action/adventure films to have more short/quick takes than other films – and you can expect certain directors (Stanley Kubrick, Quentin Tarantino,

[7] And editors, for that matter.

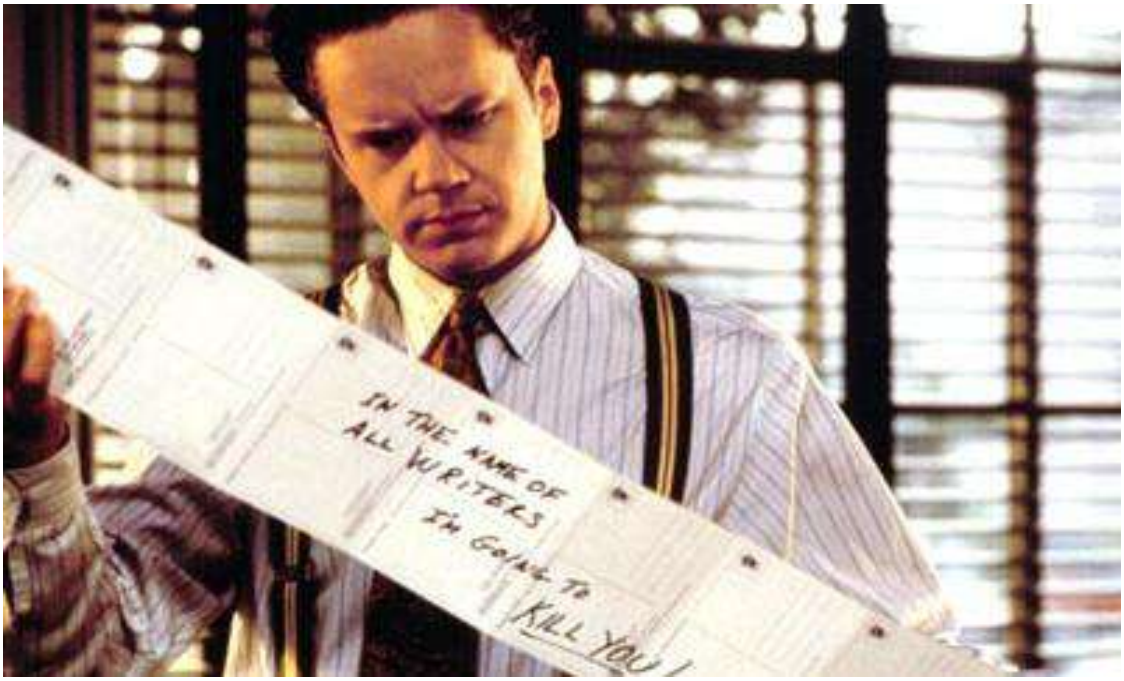
Paul Thomas Anderson, Orson Welles) to make use of very long takes. The most extreme example of a director obsessed with long takes may be Alfred Hitchcock, whose film *Rope* looks like a single 80-minute take. In reality, he shot the film in eleven takes (each take consuming an entire reel of film) but created the illusion of a single very long take by ending each take by zooming in on something black and beginning each take by zooming out of something black. But Hitchcock was weird in a number of ways. Most filmmakers settle for the challenge of the 4- or 8- or 12-minute take when they want to show off their long-take abilities.

One of the American cinema's first widely-praised **long takes** is the nearly-five-minute opening shot of Orson Welles' *Touch of Evil* (**click the image to see the video**).

For comparison, take a look at the prevalence of **short takes** in an action film like Paul Greengrass' *The Bourne Supremacy* – the linked clip is 3 minutes long and comprises 79 takes, for an average take length of 2.3 seconds. Note that some takes within the clip are longer than 2.3 seconds and many are shorter. Can you determine which are short, which are long, and why that might be? (**click the image to see the video**).

When an extremely long take is shot in such a way that the camera moves through locations, distances, and angles – essentially shooting several scenes in a single run of the camera – that take is called a **sequence shot**. Several films are well known for their sequence shots, including *Goodfellas* and *Touch of Evil* (both linked earlier). Two impressive sequence shots are presented below: the first from Paul Thomas Anderson's *Magnolia* and the second from Robert Altman's *The Player*[8] (**click the images to see the videos**).

Magnolia



The Player

[8] To qualify as a true movie geek, listen carefully in the clip from Altman's film for the clever reference to the sequence shot in *Touch of Evil*.

Speed of Motion

Our final topic in the category of cinematography is **speed of motion** – the apparent rate at which the action on screen occurs. The vast majority of shots in the vast majority of narrative films are both recorded and projected at 24 fps, as discussed earlier. But sometimes filmmakers have a reason to want to present the action as if it were occurring slower than in real time or faster than in real time. When they want to do this, they manipulate the rate at which the shot is recorded in relation to the rate at which it's projected.

To achieve **slow motion** – a.k.a. *overcranking* – the scene is shot at more frames per second than normal (perhaps hundreds of frames per second) and then projected at the normal rate of 24 frames per second. There are many good examples, but a particularly satisfying one can be seen in the opening title sequence from Quentin Tarantino's *Reservoir Dogs* (**click the image to see the video**):

In **high speed photography** – a.k.a. *super slow motion* – the action is shot at an even higher rate (thousands of fps) and still projected at 24 fps to create a truly exaggerated slowdown. In films, high-speed photography is typically used for things like bullets shattering glass. The clip below is not from a narrative film, but it provides a terrifically observable example (**click the image to see the video**).

Time lapse photography achieves the opposite effect of slow-motion: it speeds up the action. Time-lapse involves shooting at much fewer fps than normal – perhaps one per minute or one per hour or even one per day – and then projecting at the normal 24 fps to achieve the illusion of something that takes a lot of time (a flower blooming, clouds moving across the sky, the sun rising and setting) happening very quickly, as in this scene from Godfrey Reggio's *Koyaanisqatsi (Life Out of Balance)* (**click the image to see the video**).

And finally, there are those filmmakers who want to alternate various speeds of motion within a single scene for effect. This technique of combining slow, high, and normal speeds in a single series of shots is called **ramping** – and its most famous use is still probably one of its earliest: the "bullet time" in the Wachowski brothers' *The Matrix* (**click the image to see the video**).

. . . and that's it for Cinematography. Next up will be Chapter 4: Editing.