CINEMATOGRAPHY
THEORY AND PRACTICE

Image Making for Cinematographers, Directors, and Videographers

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Focal Press

cinematography

theory and practice

*imagemaking
for cinematographers,
directors & videographers*

blain brown

Writing with motion:

the cinematographer and the director

Cinematography is from the Greek roots meaning writing with motion. This is the essence of filmmaking — it applies equally whether you are shooting on film, video, digital or High Def. In this broader sense it encompasses the job of both the cinematographer and the director.

This book covers all aspects of cinematography as it applies to every type of filmmaking. It covers knowledge, methods and techniques essential to the work of the film DP, the director or the videographer on any type of project.

The first section covers concepts that are essential to directing the camera and crucial to every cinematographer who is trying to better understand the challenges a director faces and wants to be better prepared to serve the director's vision of a project.

The purpose of this book is not only to cover all basic concepts, methods and technical aspects of cinematography but also to improve communications between the director and the cinematographer by presenting "what the director needs to know about using the camera" and "what the cinematographer needs to know about the directing process."

Any director who aspires to fully utilize all of the tools of filmmaking should have a firm understanding of the concepts covered in the first section of this book and would be wise to have at least a passing understanding of the technical aspects covered in the second section — if only to have a firmer grasp of the limitations and, more importantly, the possibilities.

Topics include:

- Using the camera to tell a story.
- Language of the lens.
- Cinematic continuity.
- Lighting for film, digital and High Def.
- Exposure.
- Video and telecine.
- Optics and lenses.

- Shooting High Def and digital video.
- Image control with filters.
- Bleach bypass and cross-processing.
- Lighting as storytelling.
- Shooting special effects.
- Set procedures and other issues.

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Cinematography: theory and practice

TABLE OF CONTENTS

The following chapter is from

Cinematography: theory and practice
    imagemaking for cinematographers, videographers and directors

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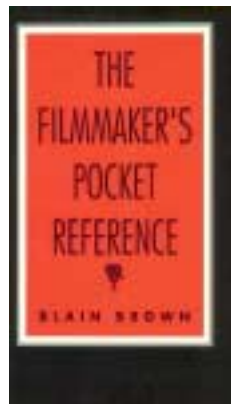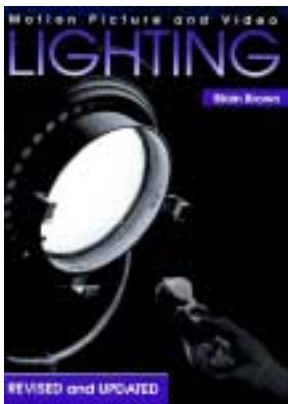
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    Illuminacion en Cine y Television. 1996, Escuela de Cine y Video
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lighting as storytelling

STORYTELLING

In previous chapters we have looked at the technical and practical aspects of lighting. In this chapter we will look at lighting as a key element of storytelling.

Let's divert our attention from film for a moment and look at two paintings. Studying classical art is useful in that the painter must tell the whole story in a single frame (not to mention without dialog or subtitles). Thus the painter must employ every aspect of visual language to tell the story of the painting as well as layer it with subtext, symbolism and emotional content. As with the films of Kubrick, Welles and Kurosawa, it is also useful to study the visual design as nothing in the frame is accidental. Every element, every color, every shadow is there for a purpose and its part in the visual and storytelling scheme has been carefully thought out.

First, let's look at this beautiful painting by Joseph of Derry, Figure 9.1 on the previous page. It is called *A Philosopher Giving A Lecture On The Orrery*. The orrery is a mechanical model of the solar system, sort of like a small planetarium. This painting was made at around the same time that Newton published his new theories of physics and gravitation. The philosopher has placed a lamp in the center of the device to represent the sun for his students. The beautiful single source casts a light so reminiscent of many of the paintings of de La Tour. It is a clean, simple light which makes the faces glow with fascination and the excitement of learning.

Light also has a great power to form space. In this case, the central source forms a sphere of space which envelops the students. Outside it is another space, sharply delineated. Within the sphere of light is knowledge, outside is darkness — ignorance. As Newton said, "What we know is a drop, what we don't know is an ocean."

Clearly the light represents knowledge, the illuminating power of the great mystery of the universe, but it is not just a symbol — it tells the story itself. Let's go back briefly to our primary example, Caravaggio's *The Calling of St. Matthew (*Figure 9.2). As we mentioned briefly in the chapter on *Visual Language*, the light is a crucial part of the design. It carries a major portion of the storytelling as well.

The boldness of Caravaggio's vision (and what makes this painting the genesis of the Baroque as opposed to merely an extension of the Renaissance) is that he sets this tale from the Bible in common settings (and contemporary for his time) — a dimly lit tavern; some local lowlifes are drinking and playing cards. Christ, who is giving Matthew his calling as a disciple, is mostly in shadow, almost a background character, barely seen in the back at the far right, his outstretched hand bridging the gap between the two groups. The fact that he is in shadow is important, as is the small slash of light that falls across his face.

H.W. Janson discusses the painting in his *The History of Art*: "Most decisive is the strong beam of light above Christ that illuminates his face and hand in the gloomy interior, thus carrying his call across to Matthew. Without this light, so natural yet so charged with symbolic meaning, the picture would lose its magic, its power to make us aware of the divine presence."

The lighting is chiaroscuro at its best; not only does it create strong contrasts and clearly delineate the characters in sharp relief (the figures almost jump out at us), the strong directionality of the light guides the eye and unifies the composition. What is unimportant falls into shadow and thus does not distract the eye. According to Edmund Burke Feldman in *Varieties of Visual Experience*, "In Baroque painting, light is an aggressive liberating force. A small

9.1. (previous page) *Philosopher Giving A Lecture On The Orrery*, Joseph of Derry. (Photo courtesy of the Derry Museum, Derry, England.)

9.2. (below) Caravaggio's *The Calling of St. Matthew*. The lighting carries a great deal of the storytelling power of the image.

amount of it is enough to reveal the spiritual opportunities that lie hidden." Here the strong beam of sunlight is the hand of God itself, reaching into the dusky tavern to pluck Matthew out of the darkness. The light coming from outside is clearly the presence of the divine truth; it penetrates the dusty darkness of ignorance in the tavern, thus the shadows are equally important — ignorance, lethargy and wasted lives. As we discussed in *Visual Language* they also form negative spaces which are important compositionally.

They are both powerful, enigmatic paintings that carry depths of meaning and content far beyond their mere visual beauty — the kind of thing we strive for every day on the set. All that is missing is a producer in the background saying, "It's awfully dark, couldn't we add some fill light?"

ORIGINS OF MOTION PICTURE LIGHTING

Historically, motion picture lighting has gone through a number of periods. At first it was purely functional. The low speed of the film and the lenses together with lack of high-power, controllable light sources made it a necessity to just pour as much light as possible onto the scenes. As a result, most films were filmed outdoors in broad daylight.

Even studios were outdoors: sets were built on the backlots in open air, using the sun as the luminaire. The very first studio was developed by K.L. Dickson, the co-creator (with Thomas Edison) of motion picture technology. Called "Black Maria," it was built on a revolving platform, so that it could be rotated to follow the sun as it crossed the sky during the day (Figure 9.3).

In New York, where the film industry was born, studios were built with glass ceilings on the top floor of buildings. The only form of control was huge tents of muslin, which could be stretched across the ceiling to soften and modulate the light. Later, adaptations of arc lamps were used to provide a degree of illumination, but with little control. Gas discharge tubes very similar to modern fluorescents (Figure 9.4) were also used, but they too were just raw sources. This was not considered a problem, however. At that time, in the theater, "natural" lighting was considered to be broad, flat lighting which merely illuminated the elaborate sets.

It was the brash talent of theater impresario David Belasco and his lighting designer Louis Harttman who turned this trend around. Belasco's emphasis was on realistic effects to underscore the drama. Also working at that time was Adophe Appia, who believed that the shadows were as important as the light, and that the manipulation of light and shadow was a means of expressing ideas.

It was an actor who had worked for Belasco who translated many of these ideas in to the world of film: a young man named Cecil B. DeMille. Working with cameraman Alvin Wycoff, he employed expressive single source lighting that was both naturalistic and visually involving. When Technicolor was introduced, the necessity of huge amounts of light was a setback for natural, expressive lighting, but black-and-white films still continued to use lighting creatively and effectively.

FILM NOIR

Certainly, one of the highlights of lighting as storytelling is the era of film noir: American films of the forties and fifties, primarily in the mystery, suspense and detective genres, nearly all of them in black-and-white. The noir genre is best known for its low-key lighting style: side light, chiaroscuro, shadowy (Figure 9.5). This was, of course, only one of the various elements of visual style: they also

9.3. (top) The Black Maria, developed by Edison and Dickson, the first method of controlling lighting for filmmaking.

9.4. (above) D.W. Griffith and his cameraman Billy Bitzer examine a piece of negative in front of some Cooper-Hewitt tubes, one of the earliest artificial lighting sources. (For a more extensive discussion of the history of film lighting see *Motion Picture and Video Lighting*, by the same author, also published by Focal Press).

9.5. The black-and-white noir period is one of the highest achievements of film lighting as a story element — this frame from *Mildred Pierce* (Warner Bros., 1945).

9.6. Although not strictly a noir film, *Citizen Kane* is of the same era and employs the same techniques of visual storytelling with lighting that is expressive, visually striking and makes specific story points. Here the reporter has come to the vault where Kane's memoirs are kept. As the guard brings forward the sacred book which we hope will contain the ultimate secrets, the single beam of light represents knowledge reaching into the darkened space in much the same way that it does in the Caravaggio (Figure 9.2).

Being a backlight with no fill, it leaves the characters in complete silhouette, representing their ignorance of the knowledge. (*Citizen Kane*, RKO, 1941. Now owned by Turner Classic Movies).

9.7. An example of the classic metaphor of noir— the characters trapped somewhere between the dark and the light, good or evil, knowledge or ignorance. In this frame from *The Big Combo*, which we previously looked at in *Visual Language*, the detective and the woman have triumphed over the bad guy and are emerging from the darkness into the light.

As in the shot from *Citizen Kane* (Figure 9.6), the light seems to exert an almost palpable pull on them. Backlit and glowing, the fog forms a concrete space distinct from the foreground space of blackness and emptiness. Silhouetted and faceless, the shot is about their situation and the resolution of their conflict, not about their individual thoughts or expressions at this moment.

used angle, composition, lighting, montage, depth and movement in expressive new ways. Many factors came together to influence this style: technical innovations such as faster, finer grained black-and-white negative, faster lenses, smaller, more mobile camera dollies, cameras light enough to hand-hold and portable power supplies, all perfected during World War II, alleviated many of the logistical problems previously connected with location filming.

This enabled filmmakers to get out to the dark, mean streets of the city with its shadowy alleys fraught with unknown dangers, blinking neon lights reflected on rain-soaked pavement and all of the mystery and menace of the city after dark. Beyond just the gritty reality and groundedness that come with actual locations, the challenges and various difficulties of lighting in and around real structures tend to force cinematographers to experiment and be bolder with their lighting — there is less of a tendency to just do it the same old way it's always been done back in the studio.

The second result of the war was the influx of European directors and cinematographers who brought with them the "...full heritage of German Expressionism: moving camera; oddly angled shots; a chiaroscuro frame inscribed with wedges of light or shadowy mazes, truncated by foreground objects or punctuated with glinting headlights bounced off mirrors, wet surfaces, or the polished steel of a gun barrel." (Alain Silver and Elizabeth Ward, *Film Noir*).

But all of this is more that just visual style: it is inherently a part of the storytelling, an integral narrative device. "A side-lit close-up may reveal a face, half in shadow, half in light, at the precise moment of indecision." (Silver and Ward). Beyond narrative, it becomes part of character as well — noir was the birth of the protagonist who is not so clearly defined as purely good or evil. As with Walter Neff in *Double Indemnity* or Johnny Clay (the Sterling Hayden character) in *The Killing* and so many others, they are characters full of contradiction and alienation. In their very being they may be pulled between good and evil, light and dark, illumination and shadow. This reflects the confusion and sense of lost ideals that returned with the veterans and survivors of the war. It also reflects the "zeitgeist" of the times: the growing undercurrent that not all things can be known, "...the impossibility of a single, stable point of view, and thus the limits to all seeing and knowing." (J.P. Tellotte, *Voices In the Dark*) — that what is unseen in the shadows may be as significant as what is seen in the light.

LIGHT AS VISUAL METAPHOR

Let's turn now to a more recent example, a film that uses light as a metaphor and as storytelling perhaps better than any other of the modern era: Barry Levinson's *The Natural*. Masterfully photographed by Caleb Deschanel, the film is so visually unified and well thought out that it would be possible to comment on the metaphoric or narrative use of lighting in almost every scene; here we will examine only the high points.

In the opening shot we see the title character alone, dejected and older, sitting at a railroad station. He is half in light and half in shadow, a metaphor for his uncertain future and his dark, unclear past. The train arrives and blacks out the screen. He gets on. End of title sequence. It is mysterious, suggestive and supremely simple (Figure 9.8).

The Natural is the tale of a talented young baseball player Roy Hobbes (Robert Redford) who is diverted from his career by a chance encounter with a dark and mysterious young lady, but makes a comeback years later as he simultaneously finds love with his long lost childhood sweetheart. It is a story of good versus evil in the classic sense and Levinson and Deschanel use a wide variety of cinematic and narrative devices to tell it.

As the story begins, Roy is a young farm boy full of energy, talent, promise and infatuation for his sweetheart Iris (Glenn Close) who always wears white. This section is shot in bright afternoon sunlight: the vibrant energy of nature with just a hint of a soft filter. It is back-lit with the sun and everything is warm and golden.

His father dies of a heart attack in the shade of a tree and that night there is a ferocious storm: inky blue punctuated with stabs of violent lightning. A bolt splits the tree and Roy uses the heart of the tree to make his own bat which he inscribes with a lightning bolt: a symbol of the power of nature: light in its most intense, primitive and pure form. He gets a call from the majors and asks Iris out for a last meeting. They are silhouetted on a ridge against a glowing ultramarine blue sky which represents night and the temptations of eros (Figure 9.9). If you look closely, it is completely unnatural (it's day-for-night with a blue filter) but beautiful and perfectly portrays their mental state. In the barn, as they make love they are engulfed in stripes of moonlight alternating with darkness: it is a radiant

9.8. The opening shot from *The Natural* — a faceless character lost somewhere in the light and the dark, suspended in time: the past is uncertain and the future is unclear. This purgatory of being caught between them establishes the mood and tone of uncertainty and conflict between two worlds that is carried through the rest of the film. (*The Natural*, Tristar Pictures/RCA/Columbia, 1984.)

9.9. (top) Early in the film, Roy and Iris are young and innocent, but their purity is disrupted when they meet in the blue moonlight and make love. We will only find out at nearly the end of the film that this loss of innocence leads to a son, which Roy does not know about until he is redeemed and recovers this purity which is represented by the golden sunlight of a wheat field where he plays catch with his newly discovered son. Here and in his love tryst with Memo Paris (Figure 9.13) blue represents the danger of succumbing to temptation.

9.10. (above) The Lady In Black — the temptation that leads to Roy's downfall. She is always lit dimly and is somewhat shadowy — an ephemeral figure; in this shot underlit for a mysterious look.

moment but there are hints of danger (we will learn much later in the film that she is made pregnant by this encounter). As he boards a train to travel to his major league tryout, things darken a bit. The only light source is the relatively small windows of the train and while they admit plenty of light, it is low angle and somewhat shadowy and malevolent.

LIGHT AND SHADOW — GOOD AND EVIL

It is here that he first sees the woman who is to bring evil and temptation into his life — The Lady In Black (Figure. 9.10), who we first see in silhouette and from the back. Usually portrayed backlit or in shadow, as befits her evil nature, she invites him to her hotel room, shoots him and then jumps to her death, ending his baseball hopes.

Sixteen years later, we see him arrive at the stadium of the New York Knights. He is in total darkness as he walks up the ramp, then emerges into sunlight as he enters the ballpark: he is home, where he belongs (Figure 9.11). Given his first chance to play, the sequence opens with a shot of what will become an important symbol: the lighting towers of the field. They are dark and silhouetted against black storm clouds. It is twilight, halfway between day and night. As he literally "knocks the cover off the ball" there is a bolt of lightning and it begins to rain. Lightning, the most powerful form of light, is a recurring symbol throughout the film — light as pure energy, bringing the power of nature. Coming back into the dugout, we are introduced to a second visual theme: the flashbulbs of news photographers (Figures 9.14, 9.15 and 9.16).

As one of his teammates adopts the lightning bolt as a shoulder insignia, the team takes off; a symbol of the power of light and energy that Roy has brought to the squad. They are on a hot streak. Now we meet the Judge, half owner of the team. Slimy and evil, his office is completely dark, lit only by the dim light that seeps through the closed venetian blinds (Figure 9.12). His face is obscured in shadow. After the Judge tries to get him to lose so he can buy the team, Roy rebuffs him and on his way out defiantly flips the room lights on. Then the bookie emerges from the shadows.

Their attempt at bribery having failed, they contrive to set him up with Memo (Kim Basinger, who always wears black) at a fancy restaurant, where the only illumination is the table lamps which cast an ominous underlight on the characters, although fill is added for Roy (purity) and Memo (raw beauty). She takes him to the beach and in a reprise of the love scene between Roy and Iris they are bathed in blue moonlight. But this is a slightly different moonlight than we saw with his boyhood girl: colder and harsher; sensuous, but not romantic (Figure 9.13). She comes to seduce him and she is completely in silhouette, sexy but still mysterious.

9.11. After years of foundering in the narrow darkness of obscurity, Roy emerges into the light of the one thing that gives him power — the bright sunny open space of a baseball field.

FADING FLASHBULBS

Next comes a montage sequence of flashbulbs popping, symbolizing fame, celebrity, glamour and the seduction of the fast life which will distract him from baseball. Roy descends into a slump, bringing the team down with him. In his decline, the flashbulbs still go off, but in marvelous subtlety we see them in slow-motion at the end of their burn cycle as they fade out. Iris comes to a game to watch, unbeknownst to Roy. As the team is losing and Roy is striking out, Iris stands up (Figure 9.19). Her translucent white hat is backlit by a single shaft of sunlight, making her appear angelic. Roy hits a home run that breaks the stadium clock — stopping time. Photographers' flashbulbs go off and as Roy peers into the crowd looking for Iris he is blinded by them and can't see her (Figure 9.17). Later, they meet and go for a walk. As he tells her the story of his dark past, they are in complete silhouette, in darkness even though it is midday. As he ends his confession they emerge into full daylight. Later, the silver bullet that has been in his stomach sends him to the hospital.

9.17. (above) His long lost love Iris comes to a game. Roy seems to sense her presence, but as he turns to look for her, he is blinded by the glare of the photographer's flashes.

9.18. (above, right) As Roy's light on the field promises to rescue the team and spoil the Judge's plans, he watches from his shadowy lair. This image is repeated at the end of the film when Roy's home run seals the Judge's fate and the fireworks of exploding bulbs glare on the Judge's glasses.

9.19. (right) As Roy is faltering on the field, near defeat, Iris stands up and a single beam of light illuminates her so that she is visible in the crowd — it gives him the power to hit a home run and win the game. The angelic glow makes her hat a halo to supplement the white dress and the standing pose. To reinforce the lighting effect, she is surrounded by men only, all in dark clothes and hats.

9.20. (below) As a reporter comes close to uncovering Roy's dark secret, he sneaks onto the field to photograph him at batting practice. To stop him, Roy hits a ball with perfect aim that breaks the reporter's camera; the flashbulb fires as it falls to the ground — the glare of disclosure, of secrets being brought to light, is prevented by Roy's sheer talent with the bat.

9.21. (right) As Roy lays ill in the hospital before the playoffs, the Judge comes to offer him a bribe. Rather than rendering the Judge in shadow as might be the obvious choice, Deschanel arranges for the warm glow of the otherwise benevolent hospital lamps to glare on the Judge's glasses — thus the light itself manages to obscure his eyes and partly disguise his evil. This is appropriate as he appears here not as the intimidating force of evil but as a silky voiced cajoler.
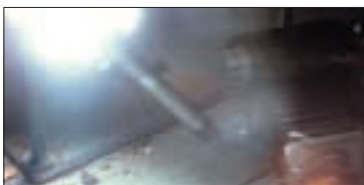
Against doctor's orders, he tries to practice in secret, but the reporter attempts to take a picture of him. Roy hits a ball that smashes his camera which falls to the ground and the flashbulb fires as it breaks: he is striking back at the glare of publicity that has nearly destroyed him (Figure 9.20).

The final climactic game is at night and the stadium tower lights burn brightly. The Judge and the bookie watch the game from his skybox, which we see from below as just a pale yellow glow on the partially closed blinds: an image of evil and corruption hovering over the game (Figure 9.18).

Roy is struggling as his injury plagues him and it all comes down to one final pitch which will win or lose the pennant. Having it all rest on the final pitch is, of course, a given in any baseball movie, but the cinematography and the metaphor of lighting and lightning together with the mystical glow of the dying sparks gives this scene a magical quality which makes it one of the most memorable final scenes in American cinema and visually one of the most moving.

9.22. (above) The moment before the do-or-die climactic pitch is thrown, lightning (which has always brought the power of good to Roy) strikes the light towers of the baseball field.

9.23. (above, left) As Roy connects powerfully with the ball, he is framed so that the lights of the field (representing the ennobling power of baseball) are in the shot with him.

9.24. (left, below) Roy's home run strikes the lights of the field; one shatters, short circuiting them all and they explode in a shower of fireworks.

VISUAL POETRY

Roy slams a home run right into the stadium lights (Figure 9.23), which shatter and short-circuit, sending a shower of sparks onto the field (Figures 9.24 and 9.25). In one of the truly great images of contemporary cinema, as he rounds the bases in slow-motion triumph, Roy and his celebrating teammates are enveloped in these glowing fireworks, as if miniature stars of glory are raining on them. A soft, golden glow of light personified engulfs them as the film ends. It is the light of pure good; Roy and the power of his talent as symbolized by the bat carved from the tree struck by lightning have transformed them and invigorated them with the essence of all that is good about baseball (and all that it symbolizes about American democracy).

The firefly-like glow comes from the exploding lights of the field (the illuminating spirit of baseball), shattered by Roy's home run (his talent) which have just been struck by a bolt of lightning — the same lightning that has brought Roy the power of his unsullied talent). These are symbols and they work, but there is a more subtle visual metaphor at work and it is what makes the shot so hauntingly evocative. What is magical about this shot is that the light is everywhere, it is an omnipresent bathing glow, it is all around them, it almost seems to emanate from within them as they bask in the beauty of a pure and simple moment of triumph in baseball and the triumph of right over the insidious attempts of the Judge to infect baseball with his money-hungry infestation.

With this elegantly simple but visceral and expressive visual image system, Levinson and Deschanel make the most of and add extra layers of meaning onto a great story, a great script and a superlative cast. In this particular film, light is used as a metaphor in a very clear and sustained way. In most films, lighting is a part of storytelling in more limited and less overtly metaphorical ways, but it can always

9.25. As Roy rounds the bases, the sparks from the exploding bulbs surround him and his jubilant teammates in a soft gentle wash of light- they are enveloped in an omnipresent glow of the power of pure good triumphant over evil — one of the most beautiful and haunting images in modern cinema. The light is non-directional — it is all around them, part of them, within them.

be a factor in underlying story points, character and particularly the perception of time and space. Filmmakers who take a rejectionist attitude toward lighting are depriving themselves of one of the most important, subtle and powerful tools of visual storytelling. Those who reject lighting are often those who least understand its useful-ness and eloquence as a cinematic tool.