# Film-Tech

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FILM NOTES FOR THE

# REEL PEOPLE

31 A TECHNICAL SERVICE FOR FILMHANDLERS FROM EASTMAN KODAK COMPANY

James Cameron
Film Visionary

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A TECHNICAL SERVICE FOR FILMHANDLERS FROM EASTMAN KODAK COMPANY

SPRING 1993

# Letters to the Editor

Dear Film Notes,

Have you ever published a list on film production terminology, Best Boy, Gaffer, Grip, etc. I get asked quite often by our patrons to define these terms in the film credits, and I want to provide them with proper answers. Could you please send me any information that you have on these terms.

Michael Finkel
Hyannis, Massachusetts

*Dear Michael,*

*Thank you for your letter. We do cover these terms in our "Film From Start to Finish" seminars, as well as many other aspects of film production, manufacturing, and processing. We have yet to put them in a* Film Notes *issue, but would consider doing a lexicon in an upcoming issue.*

*IS FILM FOREVER? An editorial from Gary Borton, Eastman Kodak General Business Manager & Vice President, Western U.S. and Canada, Motion Picture & Television Imaging.*

Almost from the beginning, the assumption has been that film is forever. As early as 1915, Sarah Bernhardt told a fan, irate that a great stage actress like herself would "stoop" to appear in movies, that film was her one chance at immortality. Early television producers also saw film as a means to serve posterity. Lucille Ball and Desi Arnaz insisted on producing the *I Love Lucy* series on film before a live audience, maintaining ownership of the program in exchange for footing the bill for the extra costs of shooting on film. Nearly forty years after they were made, the *I Love Lucy* shows are still entertaining people and earning dividends.

Today, the production industry is at another historical juncture. Audiences are fragmenting, network revenues are shrinking, licensing fees are falling, above-the-line costs are soaring, new channels of distribution are proliferating, and high-definition television (HDTV) is beckoning.

Various combinations of these factors have created incredible pressures to reduce costs. Some producers are asking if they can save money working in the 16 mm or Super 16 formats. The answer is yes, although there are resultant compromises made in image quality. Film and lab cost savings for shooting 16 mm or Super 16 mm are around $16,000 for a thirty-minute program. But will these films be forever?

Let's assume that sometime before the end of this decade, there will be markets for recycling today's programs in digital HDTV format. If you scan all of the analog visual information recorded on a conventional 35 mm film frame and convert it to digital data for postproduction, you are going to fill up approximately 40 megabytes of computer memory. In other words, the 35 mm film frame is an incredibly rich repository for capturing and storing visual information.

A 16 mm or Super 16 mm film frame is capable of capturing and retaining just a little more than one-fifth of that visual information. Is that sufficient for HDTV? The answer is yes, for now. But many people envision a time in the not-so-distant future when HDTV sets will offer 2000 lines of resolution and will double as home computers. That will require conventional 35 mm film resolution.

Super 16 mm, providing an aspect ratio which is compatible with the wide-angle 16:9 HDTV screen, is somewhat HDTV-compatible. With conventional 16 mm film, you would have to trim something off of every frame to get a wide-screen HDTV image. However, due to the fragile nature of both 16 mm and Super 16 mm film, neither is adaptable to this technique. Dirt, scratches, and even grain, which is unnoticeable in 35 mm format, might be apparent if a 16 mm or Super 16 mm frame is converted.

Thus, as surely as 35 mm film remains the standard of resolution excellence, it is also firmly positioned as the foundation for the high-definition and digital technologies of the future.

If you have any questions or comments, please write to:
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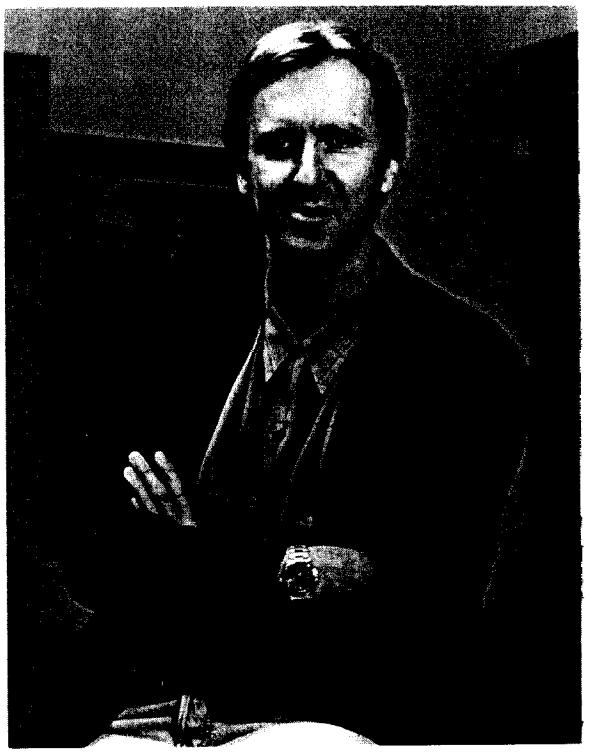
## Contents

# es Cameron, Film Visionary

James Cameron burst into the public eye and into movie theatres in 1984 with his futuristic vision, *The Terminator.* Not only was it a box office success, *Terminator* launched several acting careers and gave us the cutting edge of visual technology. With each of his next three pictures—*Aliens, The Abyss,* and *Terminator 2*—Mr. Cameron has continued to enrich our visual appetites as well as combining action, drama, and comedy with every film. He is involved with almost every aspect of the filmmaking equation, and his campaign to improve the quality of the film presentation has influenced many changes within the industry.



James Cameron

***What inspired you to become a film director? What was your motivation?***

A. I was interested in images and photography in general, especially the motion image, which translated into animation for awhile. I just picked up a Super 8 camera when I was 15 or 16 years old and started shooting film. I think anyone that is attracted to filmmaking really has an innate sense of what goes into creating an image and the desire to tell a story. If all you're interested in is the image you'll go into photography or you'll paint. If you want to use images to tell stories, then you're a filmmaker.

***You really seem to enjoy the challenges of technology, both in special effects and mechanical innovations. Do you feel that you've met your limitations, or are there other areas that you would like to explore?***

A. Every time I make a film I try to push myself beyond what I've done before. I think that's critical whether I'm pushing myself dramatically, artistically, or technically. It doesn't matter as long as I feel challenged. I would hate to think that I had met my limitations. *Terminator 2* was a pretty tough movie to make. But that had more to do with the time frame than with the technological problems. Yes, I would like to keep pushing the envelope. For me, that translates into pressing dramatic limits when directing an actor and what I can accomplish as a writer. It's not technology driven. I have managed to surround myself with some very good people in the technical areas, and they're good at problem solving. So it's not about me doing it all single-handedly.

*Do you think there will be a point where effects will become overkill?*

A. I get asked this question a lot, and it seems that everyone asking the questions secretly knows the answer before they ask it. The answer is: The market determines the saturation level of visual effects. No movie that was just a visual effects film, without any substance behind it, ever made money. This lesson is constantly being learned over and over again. Keep in mind, it's only been since the 50's and 60's that visual effects started to become marketable. The audience still ultimately determines what goes into a movie. They want stories about people, and they want to be visually challenged and excited – transported to other realms and worlds and other levels of experience, and sometimes that requires all of these tools and techniques. But those things in and of themselves don't make a successful picture.

*"There are a lot of pretty dim screens out there. I think it is a big issue. The studios and labs should never try to print lighter to accommodate insufficient light levels in the theatres."*

*Do you feel that technology has kept up with your visual expectations?*

A. Yes, absolutely. I think we are in an image-creation renaissance right now where almost anything that you can imagine can be accomplished. I'm not saying it can be accomplished cheaply, but it can be accomplished, which had never really been the case before. For instance, I came up with the idea of the liquid metal robot from the future back in 1981, which later become the T-1000 in *Terminator 2*. There was no way to do it back then, so I pulled the idea out of the original *Terminator* script and kept with things I knew could be accomplished at the time. But I don't think those limitations exist anymore.

*"I think we are in an image-creation renaissance right now where almost anything that you can imagine can be accomplished."*

*If you applied your filmmaking vision to theatrical exhibition, what would you like to change about the movie-going experience?*

A. In general, I would improve the quality of some theatres, but frankly, it's been getting better. It's just frustrating when you spent so much time mixing a film and getting the sound perfect to realize that 90% of the prints are Dolby A (and not Dolby SR, or digital sound). It's heartbreaking that most of the people experiencing your film in a theatre are not experiencing the full sound. I think all film-makers feel this frustration. If you tap any directors on the shoulder and ask them, they will probably say the same thing.

*Please tell us about the expanded version of* The Abyss.

A. Well, the project started off as a laser disc release, but at a certain point I looked at how much extra it would cost to do a film finish. There were certain costs attached to doing the film finish and having to strike the IP (interpositive) sections, cut them in, and re-time the entire picture. It was a lot of work fine cutting and mixing 27 minutes of footage. But I'm a filmmaker and what I wanted was to see it on the screen. I didn't care if it only meant making one print. I just wanted to be able to sit in a theatre and watch this movie.

*How often do you go to the movies?*

A. Under normal circumstances about three times a week. Lately, between writing, putting together this digital company, and just having my first child, I haven't been getting out as much. I am an avid moviegoer, and I've always promoted seeing films in a theatrical presentation.

*What do you think about the picture image in most theatres, and the presentation in general?*

A. I think that all of the quality improvements in release prints that everyone has fought so hard for over the years have really made a difference. If you go back and look at the way stuff looked 10 or 15 years ago, film

prints just didn't look that good. I think the quality of release prints in theatres today is pretty good. I looked at prints of *Terminator 2* that were cranked out at 3,000 feet a minute, and it was incredible how quickly they got 2,800 prints completed in seven or eight days. I thought, there is no possible way that all these prints could look good, so I spot checked theatres all over and found they looked pretty good. I might see a reel that was a point magenta or a point green or whatever, but basically I have to say that this part of it is under control. It is possible to generate good release prints with a good lab, and with good people involved.

*Do you find it difficult to watch a film with such a critical eye?*

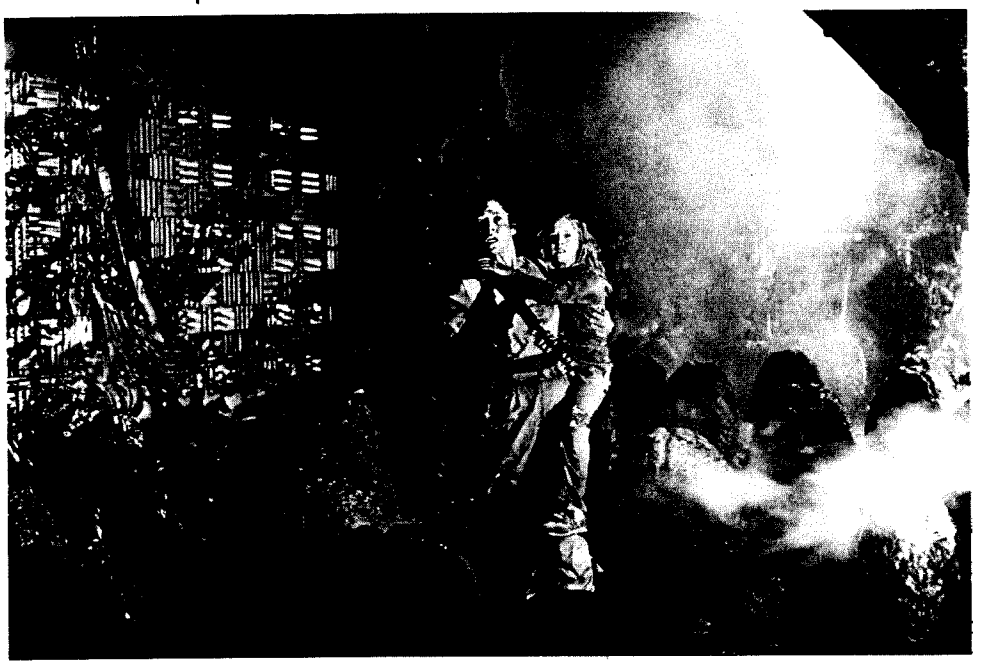
A. No. What saves me is being a writer. I tend to think in terms of story, and unless a film is really scratched up or offensive in the presentation, I get into it and see it as a movie. I can switch into a "fan mode" pretty easily. When I see an offensive problem, often it's inherent in the film. I've seen some big pictures recently that had photography that clearly was at least 2 stops underexposed, and yielded a really horrible print on the screen. You know it's not the lab. You can tell this by the grain. The grain was in the original negative that way, because the intermediate stocks and the print stocks are such fine grain you couldn't see grains that big any other way. So a lot of the responsibility is on the shoulders of the D.P. (Director of Photography) to really use the system properly. Sometimes it's due to underexposing the film. That's a big mistake.

Forty percent of all principal photography on Twentieth Century Fox's **The Abyss** was actually shot underwater. Here, writer/director James Cameron (right), actor Ed Harris (second from right) and underwater director of photography/underwater unit supervisor Al Giddings (top left, with camera) prepare for a shot in the 7,500,000-gallon-capacity tank utilized during production of the underwater scenes in this epic adventure of wonder and discovery.

*Do you see screen luminance in the theatres as a problem?*

A. Yes, especially when you get out of Los Angeles. Part of the problem is that we are very insulated in L.A. Most of the filmmakers, producers, actors, etc., live here. When they go to their local theatres to spot check the movie, if it's not up to snuff, somebody hears about it. But that doesn't happen in the rest of the country. There are a lot of pretty dim screens out there. I think it is a big issue. The studios and labs should never try to print lighter to accommodate insufficient light levels in the theatres. That happened to me on the first *Terminator* film. It limits the darks and the contrasts and curtails the light values on the screen. It's really critical for the theatres to adhere to the 16-footlambert light reflection as a minimum standard. *(Editor's Note: 16-footlamberts is the minimum screen luminance*

*standard recommended by SMPTE.)* But it's not as bad as it used to be. Everybody's good efforts in the projection areas are beginning to pay off. I just wish the sound would come along a little faster because the shortfall between what *can* be and what *is*, is so much greater in sound than in picture right now.



Ripley (Sigourney Weaver, left) braves the innermost sanctum of the aliens' nest to rescue Newt (Carrie Henn, right), in Twentieth Century Fox's futuristic, high-tension thriller **Aliens.**

of the film, but never made the cognitive connection that there was a single mind behind it until much later. In other words, I didn't come to it from the film school approach, the auteur approach. I just saw every movie, and picked what I liked about each film. It wasn't about who influenced me or who I studied or anything like that. Sure, I'm cognizant of all the good directors and I know their best work, but I'm not interested in studying them. I think that's helped me. People who basically remulch other people's ideas, no matter how brilliant those ideas were, ultimately are not going to say anything particularly new. I'm a blue collar fan who picked up a camera and who was self taught. I didn't go to film school. All of that is important, but I don't feel that it should be the fundamental reason that a person makes films, and it shouldn't be the fundamental determinant of a personal style. People should make movies about things they have personally experienced in as much as that's possible.

*What are your first theatrical memories?*

A. I would have to say that I have a vivid memory of sitting in a theatre at a very young age, maybe 8 or 9, and watching *Jason and the Argonauts.* I talked my grandfather into taking me to see it, and I was pretty blown away by it. It's funny because if you watch it now, the effects are neat, but they're quaint and wouldn't hold up for today's audience. I do remember my first movie, but it wasn't in the theatre. They used to run it once a year on T.V. in Canada, which is where I grew up. From the earliest age, no matter what was going on, I had to stop and see *The Wizard of Oz.* It's still my favorite movie.

*Who are some of the filmmakers that inspired you?*

A. It's hard to say. I never really related to films coming from a specific director. For me, it was a Hollywood movie and I remember many of the details

*Do you feel that there can be anything done differently to help market movies?*

A. It depends. Any marketing tool that's valuable has been explored, and the distributors have a full quiver of arrows for how to market a picture. I can't imagine what else they would do that they're not currently doing. However, they are doing some things that I don't think they should do. Quite often they give away too much in the trailers. I've seen trailers where I know the movie, all the beats, and it doesn't fascinate me to see it. I'll wait for it to come out on tape. Maybe that's my own particular approach to films, but I think the film should get to make its key dramatic points on its own terms. You can also err the other way, and not give people enough of an x-ray of what the film is. Then the wrong people show up. I think mis-direction in ad campaigns is another problem. They come up with a happy, upbeat, light and bouncy campaign for a film that's a dark

picture. If you don't want a dark picture, don't make the movie. But having made it, sell it the way it is. Don't just try to get some opening audience that will quickly vanish because they've been betrayed.

> *"I didn't come to it from the film school approach, the auteur approach. I just saw every movie, and picked what I liked about each film."*

***You have quite an extensive background in filmmaking in the areas of directing, producing, background layout, editing, miniatures, sound design, etc. Have you ever done sound effect work?***

**A.** No, I've never formally done sound effects, although I've certainly done enough in the course of just making movies. In *Aliens*, the voice of the Alien Queen was for the most part me screaming into a microphone.

***Did you ever get a chance to meet with H.R. Giger (Alien—Academy Award winning designer) before doing* Aliens?**

**A.** No, I've never met the man. I am a great admirer of his work. I even wrote him a note during the making of *Aliens* to say that I didn't want him to misconstrue the fact that I didn't ask him to be involved. My background is in production design and I had a strong opinion of what I wanted the film to look like. I didn't want the film to look like I plugged in all of Ridley Scott's decisions of how things were supposed to look. The film had to have its own character, and one of the fun things for me was designing the Alien Queen with Stan Winston, and still being true to what Giger had set in motion. I think Giger is a phenomenal artist, I really do. The first film (*Alien*) is much darker and works more in the subconscious than *Aliens*, which is a little more up front, and works on different levels. I always knew that, and that's what I had to bring to it. I didn't want just a clone of the first movie. I had too much respect for the first film. I wanted to do what I do best. It's a rock and roll cover of an acoustic song.

***Are there any other existing films that you would like to add the James Cameron twist to?***

**A.** I don't know. I'm pretty comfortable taking almost any idea and turning it into a good movie if I get excited about it. But no, I don't have a list of movies that I would love to remake. A lot of times I'll see a film that was made long ago, and I'll think, "Man, what you could do with that concept given the tools that are available now." That's the thing that's attractive about the idea of a remake. To me, a remake would be to take a movie made 40 years ago when the cameras were the size of Volkswagens, and couldn't really move around much, and do all the things that current technology can accomplish. I don't have any in mind, and I'm not currently planning anything like that.

***Have you thought about using 65 mm camera negative for a feature?***

**A.** I thought about it. The cameras still weigh about twice as much as 35 mm cameras. I probably shot a third of *T2* with an Arri IIIc (modified to a IIc), a camera that was designed like a German news reel camera in the 1930's. I like the camera light, and I don't like big massive things with a lot of bells and whistles. That's a limitation, but 65 mm is very, very attractive as a medium. The other factor to consider is that my films so far have had a lot of effects in them, and you have to shoot your effects in a bigger format than your principal photography. What do you do about effects, shoot them in IMAX™? If I did a western I might consider it.

> *"A lot of times I'll see a film that was made long ago, and I'll think, Man, what you could do with that concept given the tools that are available now."*

***Many of your films deal with the environment and the survival of mankind as underlying themes. How important is that to you?***

**A.** I think the importance is self answering. I've never really been a director-for-hire per se, in the sense that a studio comes along and says, "Here's a script, we'll

*Terminator 2* © 1993 Carolco Pictures

Photo by Zade Rosenthal

pay you money, go direct it." All of my films are very personal. *Aliens* is probably the biggest exception because it was based on a mythology started by somebody else, even though I personalized it. But, it is inherent that the film be rife with my own ideas. I'll probably continue to use these themes because they are very important to me. On the other hand, I am not a big crusader. I'm not involved in fourteen different causes or foundations. I feel my greatest contribution is through film because I can reach more people that way.

*"All of my films are very personal.* Aliens *is probably the biggest exception because it was based on a mythology started by somebody else, even though I personalized it."*

***Can you tell us about your deal with 20th Century Fox?***

A. Everyone thinks I have a production deal with Fox which is not true. I have a distribution deal with Fox for the U.S. and Canadian markets. My company is completely self-financed, Fox doesn't give me any money until I finish the film, and then they pay for part of the negative cost in exchange for domestic distribution rights. It's a very specific deal. It's not like most filmmaker deals with studios, in fact, it's not a filmmaker deal, it's a distribution deal. The thing that I have to keep reminding people was that the Fox deal was merely the first one we had, and it's not even the biggest. The biggest deal is with Universal. They have distribution rights for 127 countries. It's important to keep in mind that *Terminator 2* made $300 million foreign and $200 million domestic. The foreign markets for my films are in some ways more important than domestic markets in recouping costs.

***It used to be that everybody wrote off the foreign market.***

A. The foreign market has really crept up a lot. It used to be 20% of the income, and then 30, and 40, and for a film like *T2* it was over 65%.

***When T2 first opened, did you go to see it at a movie house with an audience?***

A. That's funny. I didn't do it as much as I had done it in the past. I've only seen it twice with a paying audience. At the point that I finished the film I was so burnt out because we had been scrambling and I had

seen it so many times. In the same two-week period, we did all of our final mixing, timed the answer print in 35 mm, began to color correct the internegative prints, formatted the 35 anamorphic and the 70 mm from the 65 mm internegative, all simultaneously. What that means is you're looking at reel 3, and then reel 6 of this, and reel 3 of that, and the same things over and over. By the time the film was in the theatres, it was the last thing I wanted to see. I knew pretty much what the audience response was going to be. I know that sounds a little jaded, but I was burned out so I took off for a couple weeks. By then the hysteria had died down and it was fun to watch it with an audience. They screamed in all the right places.

***Can you give us a general idea of how difficult it is to put together a production in terms of producing, directing, special effects, etc., for something like* Terminator 2, Aliens *or* The Abyss?**

**A.** You get better at it after each production, and you learn to delegate more. On the other hand, it allows you to tackle more. *Terminator 2* was a twelve-month picture, and with the scale of the effects, it should have been a fourteen- to sixteen-month project. Literally, I had twelve months from the time the script first printed out of my laser printer, even before anyone had time to look at it, to get it done. So you figure you have to spend a couple months storyboarding, then you spend a month taking those storyboards and getting bids back from visual effects companies, then awarding the work, and then letting them go into pre-production so they can start the work. Concurrently you are in pre-production yourself, casting, and refining the script. All of this was crammed into a three-month period, so we had three months to prep the picture before we went on the floor with it. So, it's kind of an unusual example, but they all seem to be like that. *Aliens* was a little longer. I think we had fourteen months on that, and *The Abyss* was the longest at around eighteen months.

***What are working days like for you during production, pre-production, post-production, etc.?***

**A.** You work about fourteen- to sixteen-hour days, and in my case, I work seven-day weeks pretty much continuously, and usually take off on Christmas Day when I'm actually in production. While we were doing *T2* I was also executive producing *Point Break*, so I was looking at their dailies and talking to the director on that

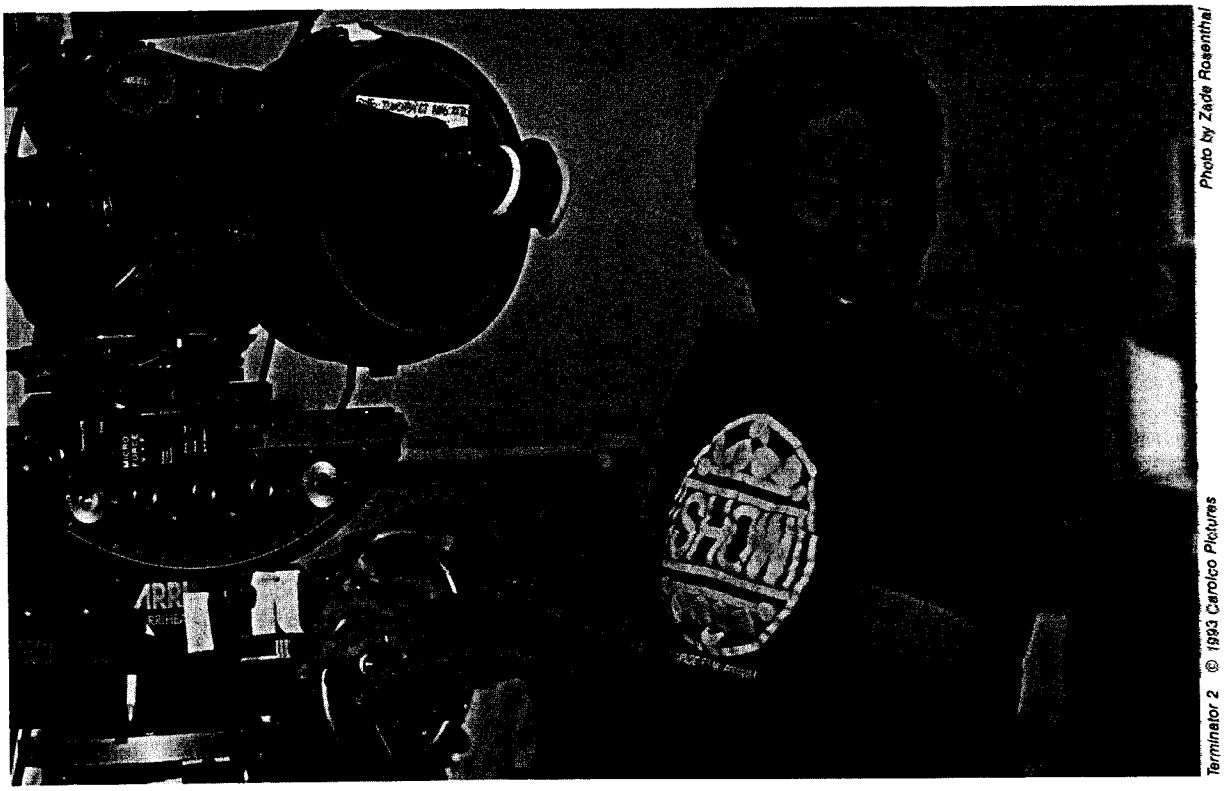


*Photo by Zade Rosenthal*

*Terminator 2 © 1993 Carolco Pictures*

project at the same time. It was a pretty hectic schedule. On a given day, you might shoot for twelve hours, at lunch you may look at some effects dailies, either on video or film. When you wrap for the day, you look at your dailies from the day before, and then you may have a production meeting. In my case, because I was an executive producing the other movie, I had a motorhome outfitted with video equipment so that I could use it at location, and back and forth from the set. I had a driver so I could work while I was in transit. I'd watch the video dailies from the other production, and sometimes I would watch video dailies from the computer graphics unit of *T2*, or something like that. Then I'd go to sleep, get up, do the shot list for the day, and go back to location. On weekends, it's mostly cutting and production meetings and sometimes advanced location scouting if all of the locations haven't been chosen. Even when locations have been chosen, you still have to go in with the director of photography and the gaffer a few days before you show up. You preplan and get the big shots roughed in. So basically it's a seven-day-a-week, fourteen- to sixteen-hour-a-day process for a year. During post you get a little break because most of the major decisions have already been made. Most of the creative authority can be delegated to other people, but there is still a lot of creative work that needs to be done, such as the cutting and finishing up of visual effects if there are effects, working with the composer, working on the score, and the sound design. I tend to be pretty hands-on, so even when I've delegated to a lot of people that I really trust, it's still a pretty busy time for me. Then once again during *T2* we were finishing up *Point Break*, and we were testing different endings. I ended up writing a new ending that we re-shot. We were trying to land two big fish, two giant tunas at the same time.

*"On Terminator 2 (T2), literally, I had twelve months from the time the script first printed out of my laser printer, even before anyone had time to look at it, to get it done."*

***With your distribution deal, do you plan on splitting your role as producer, director, etc.?***

**A.** Yes, we do plan on producing for other directors which is an exciting area for me. I won't necessarily say I enjoy writing, but I do enjoy getting the ideas down on paper and seeing the blueprint for a movie. For me, once the script is done I can see the film, or see the potential for the film. If I know someone else is going to direct, I get very excited because I know enough about their style to know what they're going to do with the material. That is going to be a big factor for us at Lightstorm: producing films for other directors. We think we've got a great deal. We've put together a structure of bank lines and foreign and domestic distribution deals, and various ancillary rights deals. It's a matrix of right deals that gives us a profitable environment for our movies. The first thing that I want to do is throw the doors open and say, "Hey, directors, get over here, you can finally make some money off the back end of a movie, instead of doing it through a studio."

***Do you read a lot of outside scripts?***

**A.** We have a development department. I have read a few that have passed through to me. Every once in a while, something comes along that strikes our fancy, and we'll acquire it and maybe rewrite it or whatever. I must say that I haven't had the experience of having a script drop into my lap that was so compelling that I wanted to drop everything and go make it, exactly word for word the way it was written. That has actually happened to me a couple times, but just at the point that I started to get really excited, I found out it was a writing sample, and someone else had already bought it.

***Many people who think they have great ideas don't know where to go. What do you suggest?***

**A.** The problem with people who think they have a great idea for what movie I want to make next are all basing their great idea on the four movies that I've done. The funny thing is, the last thing I want to do is something like what I've already done. Right now I'm writing a comedy, and a film noir thriller, and also writing a survival epic, but it's not even science fiction.

***What films can we expect from James Cameron in the future?***

**A.** The current project I'm working on is an action comedy starring Arnold Schwarzenegger. This should be the next picture that I'm going to direct, but not the next picture that we're going to produce.

# A Look at the Widescreen Projection Process

by Les Paul Robley

In 1991, Imagine Films decided to shoot their *Backdraft* using 65 mm cameras and the new generation of Eastman EXR Color Negative films. It was the first feature to be shot on this widescreen format since David Lean's *Ryan's Daughter* in 1970.

Producers Ron Howard and Brian Glazer hired Director of Photography Mikhail Solomon, who lauded the decision to use 65 mm film. Tom Cruise and Nicole Kidman were cast in the leading roles, the name was changed to *Far and Away* and the production was underway.

Since then, there seems to be a new love affair with the widescreen renaissance. When compared to 70 mm prints that are enlarged from 35 mm negatives, prints made from 65 mm negative show an increase in quality and screen detail that is dramatic. Even 35 mm prints made from the 65 mm negative are much sharper and have almost no visible grain.

The widescreen format has enjoyed a long and colorful history since its beginnings almost 100 years ago. Because large format films are beginning to enjoy a major resurgence, perhaps a historical exploration of the numerous developmental processes would prove enlightening.

**Cylindrographe:** Probably the earliest widescreen projection process invented by Moessard in 1884.

**Cinecosmorama:** 10 projectors filled a 360° circular screen with travel films similar to Disney's CircleVision, invented by Raoul Grimoin-Sanson in 1896. Earliest multiple camera/projection process.

**Lumière Widescreen:** Invented by pioneer cinematographers Louis and Auguste Lumière and presented at the Paris Expo of 1900.

**Widescope:** A double lens system that imaged scenes onto two separate films. The films were later interlocked together via two projectors. Invented by George W. Bingham in 1921.

**Tri-ergon:** The first wide film format (42 mm) introduced by Germany in 1924.

**Magnascope:** Unveiled in 1924 on the film *Old Ironsides*, this lens usually was used for the last reel of a film to make its climax more powerful, about four times larger than normal. The process was developed for Paramount by Lorenzo Del Riccio and lasted nearly 30 years. Its most memorable use accompanied the tinted tidal wave sequence in *Portrait of Jenny* (1948).

**Natural Vision:** A 70 mm film process developed by George Spoor and John Berggren that produced a stereoscopic effect when projected onto two 70 by 24' screens. One screen was transparent and the other opaque. RKO premiered the process with the film *Danger Lights* (1930), although it had been invented three years earlier.

**Polyvision:** A triptych or 3-panel process developed by Abel Gance in France, giving a pre-Cinerama effect to his 1927 *Napoleon*.

**Hypergonar:** A 3-screen process developed concurrently with Polyvision that varied the shape and size of the middle screen. Invented by Claude Autant-Lara for the film *Pour Construire un Feu* (1927).

**Grandeur:** An improvement of Natural Vision by Fox Studios that premiered in 1929 with newsreel footage of Niagara Falls and the *Fox Movietone Follies of 1929*.

and John Wayne's first "A" picture *The Big Trail.* Unfortunately, it failed when theatre owners refused to install the necessary 70 mm equipment.

**Magnifilm:** Del Riccio's second process that used a 56 mm film size to improve the picture quality of Magnascope. Noted for incorporating the 1 to 1:85 height-to-width aspect ratio now standardized by all American film productions. Premiered with *We're in the Navy Now* (1929).

**Realife:** MGM's system used standard 35 mm for projection with a wide-angle lens. What distinguished this from other lens processes was its "pre-VistaVision" optical reduction technique to improve the grain of the release print. Premiered with *Billy the Kid* (1930).

**Joseph M. Schenck's 70 mm:** A wide film format featured on the mystery *The Bat Whispers* (1930), a film noted for its innovative dolly-transitions from miniatures to live action. The miniatures were filmed on 35 mm by Roland West, process-projected onto a large screen and rephotographed in 70 mm.

**WB 65 mm:** Warner Bros. was not to be left out of the wide film race and premiered its process on *Kismet* in 1930.

**Panoramico Alberini:** Technician George Hill co-invented a 35 mm double-frame format in 1928. The film ran horizontally through the camera, pre-dating Paramount's VistaVision by 26 years. It was named after Italian professor Filoteo Alberini who had similarly pioneered a 5-perf 70 mm wide film process under the same name in 1914. It employed a 2.2:1 aspect ratio identical to what is used now in 70 mm projection. This latter process premiered in 1923.

**Giant Expanding Pictures:** Invented by a projectionist at London's Regal Theatre, this wide film process was quickly abandoned by theatre owners already up to their necks in new sound equipment.

**Anamorphosa:** From the Greek term meaning "to form again," the anamorphic theory was patented by David Brewster in 1862. The first actual lens was introduced by Italy's Ernst Zollinger for an additive color process in 1910.

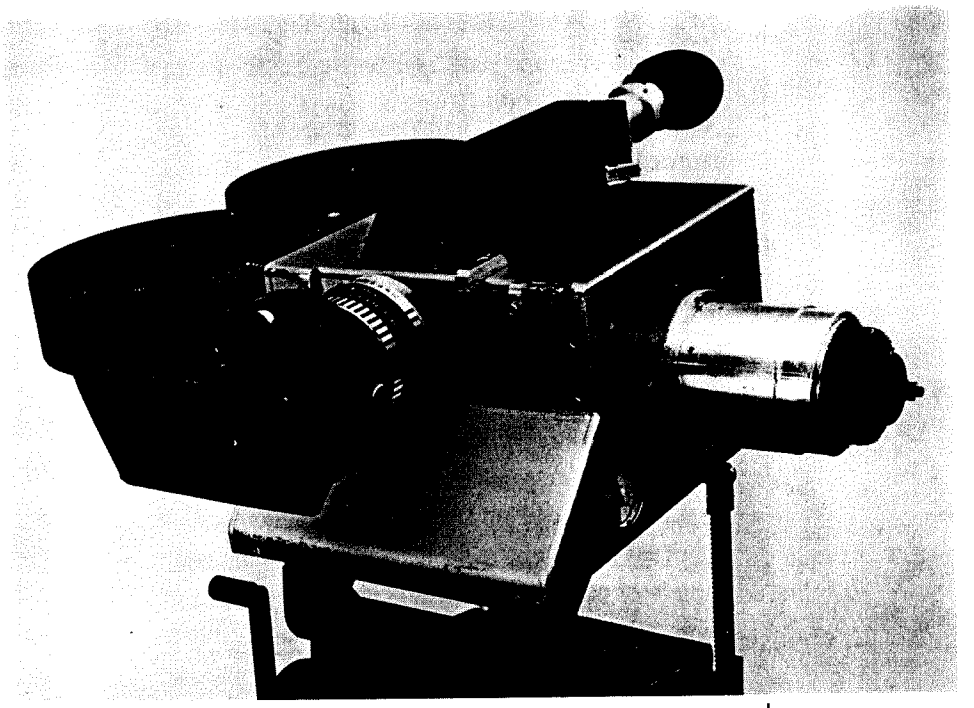
But its first use as a projection device didn't arrive until 1930, courtesy of Dr. Sidney Newcomer. French physicist Henri Chretien developed a similar "squeeze" lens called Anamorphoscope in 1931 which was later optioned (and quickly dropped) by Paramount in 1935.

**Vitarama:** Fred Waller premiered his process at the 1939 New York World's Fair petroleum exhibit. Eleven projectors covered a curved screen with one-quarter dome, analogous to our present Omnimax screen format.

**Cinerama:** The infamous roller coaster ride in *This Is Cinerama* premiered at New York's Broadway Theatre on Sept. 30, 1952, and brought the house down. Waller simplified his earlier Vitarama by using three 35 mm cameras to record scenes simultaneously through 27 mm lenses. Three interlocked projectors placed the picture in 3 sections on a deeply-curved screen, recreating a 146° horizontal viewing angle that closely matched human vision. *How the West Was Won* (1962) became the first fictionalized story filmed in the process. Later, the 3-camera system was dropped in favor of a single-lens Cinerama – a 65 mm camera using a slight anamorphic squeeze of 1.25 (similar to Ultra-Panavision) on a single piece of 65 mm negative. 70 mm release prints were made from the 65 mm negative and projected on the curved Cinerama screen. The roadshow engagement of *2001* opened in this fashion in 1968.

**CinemaScope:** 20th Century Fox's answer to Cinerama debuted on Sept. 16, 1953, with *The Robe.* It was shot almost entirely with a lens designed by Henri Chretien. Fox optioned the Chretien anamorphic system in 1952 and renamed it CinemaScope. The anamorphic principle is as follows: a cylindrical lens over a normal spherical lens squeezes a 2X horizontal picture onto a standard 35 mm frame. When projecting through a complimentary lens, this produces a wide picture ratio of 2.55 to 1 with 4-track magnetic sound, or 2.35 to 1 with optical sound. (The original CinemaScope used

a ratio of 2.66 to 1.) In 1962, Panavision introduced a new lens design, further improving the quality. Fox also introduced a lens for their low budget black and white features called RegalScope. Soon other studios and foreign countries developed their own versions of anamorphic lenses so that they wouldn't have to rent a CinemaScope lens from Fox. These include Warnerscope (53), Vistarama (54), Techniscope (64, Technicolor), Naturama (56, Republic), Cinepanoramic and Franscope (53, France), Superama (58, AIP), Vistascope (Netherlands), Delrama (Dutch), Dyaliscope (56, France), UltraScope (58, Italy), Superfilmscope (56, Italy), NorwayScope (Norway), AgaScope (58, Sweden), Sovscope (58, Russia), Swiss-scope (58, Switzerland), Tohoscope, DaieiScope, Nikkatuscope, and Sharp-scope (all from Japan), Mexiscope (57, Mexico), Alexscope (58, Argentina), Sinoscope (57, Germany), TotalScope and and TotalVision (East Germany), CamelScope (Egypt), CameraScope, CosmoScope, and SpectaScope (50s, Great Britain), Panoscope (a non-compatible 2 to 1 aspect ratio lens), AtlasScope and Vidoscope (16 mm).



8-perf Vista Vision 35 mm Camera, built by Jan Jacobson

**SuperScope:** An anamorphic lens developed in 1954 by the Tushinsky Brothers for RKO which could adapt itself to any aspect ratio frame size with the simple turn of a knob.

**CinemaScope 55:** In 1955, Fox unveiled a new 55 mm film negative system for the musicals *Carousel* and *King and I*. The increased negative area was 4 times greater and meant less grain and better picture resolution. Few theatres showed 55 mm prints, but the quality of a 35 mm was improved by using the large 55 mm negative.

**Panavision:** A variable prismatic lens invented by Robert Gottschalk in '54 that replaced CinemaScope and is currently the norm. Its sophisticated lens design eliminated the distortion problems found in other anamorphic attachments. Directors who had originally complained that the CinemaScope aspect ratio was awkward for the shot composition, welcomed Panavision's ability to film close-ups without distortion. Spinoffs for roadshow engagements include Panavision (a process in which the movie is shot on 65 mm negative), Panavision 70 (a deanamorphozing optical printing diopter which blows up a Panavision 35 mm negative to a spherical 70 mm release print), and Ultra-Panavision (a 65 mm camera incorporating a supplementary lens with a slight 1.25 squeeze ratio to utilize the entire negative area of the 65 mm frame). In the 70s, Panavision insisted that all films photographed with this equipment, whether wide screen or not, be credited as "Filmed in Panavision."

**Cinemiracle:** A three strip "Seamless Cinerama," developed in 1953, that virtually eliminated the joining lines between films. Premiered *Windjammer* in 1958.

**Thrillarama:** A 1956 dual camera/projector process similar to Cinerama.

**Todd-AO:** Michael Todd's 65 mm film process used cameras developed earlier by Del Riccio. *Oklahoma* and *Around the World in 80 Days* were the first two major productions released in the process.

**Glamorama:** Douglas Leigh's roadshow process recorded 2½ vertical 35 mm frames in the camera. A dove prism turned the vertical image horizontally for projection on a wide screen. Paramount later bought the system, and with minor changes, presented it as VistaVision.

**VistaVision:** An 8-perf horizontal image was optically reduced to a standard 35 mm frame. The resulting release print image was of such fine grain and high quality, that the process proved favorable for anamorphic prints. Paramount premiered its use on *White Christmas* in 1954. Exhibitors especially liked VistaVision since it didn't require the purchase of extra equipment.

**Technirama:** In 1957, Technicolor modified several of its 3-strip cameras to record horizontal 8-perf VistaVision. A mirror-prism anamorphic attachment slightly squeezed the image by 50 percent, so that the entire 8-perfs of negative information could be utilized for films released in 2.35 to 1 aspect ratio. Unlike CinemaScope, the mirror-prism arrangement offered no distortion problems. Later, "Technirama 70" evolved out of the 70 mm wide films then in use, and Disney's *Sleeping Beauty* became the fist 70 mm animated film.

**Kinopanorama:** In 1958, Russia released their version of Cinerama with the film *Great Is My Country.*

**Aviorama:** A sideways version of Cinerama by Italian inventor Al Moretti that positioned screens below, in front of, and above the viewer.

**Circarama:** Disney's 11-projector 16 mm circular set-up premiered at the Brussels World's Fair in 1958 under the sponsorship of Eastman Kodak, later becoming a permanent fixture at Disneyland. The name was changed to CircleVision, it was expanded to 35 mm and currently used 9 projectors and screens. An alleged Russian version uses 22 projectors with two rows of 11 screens above and below the other.

**Quadravision:** Ford Motor Company dabbled in projection as well as cars, displaying a four-projector, quadrophonic sound system in certain shopping malls in 1959.

**Wonderama:** A 70 mm image was split in half and placed on different parts of a normal frame of film. Walter Reade-Sterling's process proved not only futile, but unsuccessful as well. The only Wonderama film, *Mediterranean Holiday,* was later released in Cinerama in 1965.

Other wide angle lens processes include: Metrovision+Metroscope (MGM), AMP-O-Vision, Paravision (Paramount), Vast-Vision (Republic), Widevision (Fox), Scenic-Scope (RKO), Photorama, Perfect Tone (Swiss), Panorama Cinevision (Japan).

Other wide film processes include: Cyclotrona and Cinema 160 (Super VistaVision), Dimension 150 (referring to size of the screen), Magirama (by Abel Gance), ARC-120 (70 mm), Super Vistarama (an improved Vistarama with 65 mm film), and Introvision (a dual-screen front projection process for compositing actors into background VistaVision projection plates).

**IMAX:** This wide film process was developed in the early 70s and so far uses the largest film frame in motion picture history—3 times larger than a standard 70 mm frame and 10 times bigger than 35 mm. The extra-wide 15-perf frame increases the information-carrying capacity of film, enabling greater detail and resolution to be recorded by the lens. The 70 mm film runs horizontally through the projector via a Rolling Loop film movement. Each frame is positioned by fixed registration pins and held firmly against the rear element of the lens by a vacuum. This enables rock steady, jiggle-free projection on screens up to 54′ high by 70′ wide, ten times the size of conventional screens. The 68 percent shutter transmits one-third more lumens than the 50 percent shutter used in conventional projectors. Movies are photographed with wide-angle Hasselblad lenses and projected with Leitz Canada lenses. The octagonal-shaped theatre located next to the Los Angeles Museum of Science and Industry is purported to be the first to feature IMAX along with the THX sound by Lucasfilm.

**OMNIMAX:** The IMAX format designed for projection onto a domed (spherical) screen. A 180° fisheye lens records the images for later projection on dome screens over 57 feet in diameter. The fisheye effect is countered by the 180° dome of the theatre. The unusual theatre design limits seating capacity and requires that film be lifted 20 feet out of the projection booth to the film gate overhead. Theatres are located in San Diego and Caesar's Palace, Las Vegas. Even though the entire frame of film is unused, the dome effect envelopes the viewer's field of vision, creating a more stimulating experience.

**Showscan:** Doug Trumbull's 70 mm process projects films at 60 frames per second, enhancing dramatically the persistence of vision that enables us to see moving pictures. It is widely used for "simulator" rides in theme parks because of its realism.

**8-perf 65 mm:** Developed by Jan Jacobson (one of the creators of the first IMAX camera), this horizontal film format is presently being used for amusement park motion-simulator rides.

**The Magic Carpet:** A double IMAX system projected onto two screens: one vertical, the other horizontal, each covering 700 square meters. The images fly past underneath the audience, which feels as if they are "floating" on a glass floor. This process is exclusively found in Futuroscope Park just outside Poitiers, France. The film *Des Fleurs dans le Ciel* (Flowers in the Sky) takes viewers on a 3000 km journey following the life-cycle of monarch butterflies as they migrate to Mexico for the winter.

**KINEMAX:** The first IMAX cinema in France with exceptionally clear images – ten times larger than conventional 35 mm images on 70 mm film – projected onto the largest flat screen in Europe (600 square meters). The peculiarity of this system over that of other horizontally-running IMAX projectors is that the screen is raised at the end of the performance to let the audience out.

**Circular Cinema:** This process was installed by the American firm Iwerks and consists of nine interlocked 35 mm projectors and nine screens. The projection surface is 312 square meters, and an electronic control system synchronizes the nine films which are blended together similar to Cinerama. Today there are only about ten of these cinemas in the world: the United States, Korea, Japan, France and Taiwan.

**Dynamic Motion Simulator:** Slaved to the image by a computerized system designed by the Swiss company Intamin, the hydraulically-actuated seats simulate the action of the film. When combined with the 60-frames-per-second Showscan process developed by Doug Trumbull, this flight simulator allows for some astonishing physical sensations as the retina is saturated by a flood of images. The filmed sequences – typically roller coaster rides, runaway trains, downhill skiing – rely on a sensation of speed in order to create a feeling of vertigo for the viewer.

**Multi-Screen:** As many as ten 35 mm projectors give a veritable ballet of images on ten screens of different sizes, including one which is spherical. Created by the Canadian Museum of Civilizations in Ottawa for its premiere presentation at Vancouver's Expo '86, the didactic spectacle traces the history of human communications.

**The Cineautomate:** An interactive film in which the audience can influence the plot at a number of points. Each spectator votes from his or her seat using an electronic process. As many as eight scenarios are proposed. One of the first interactive films from the Czech filmmaker Raduz Cincera, "Le Vieil Arbre et les Enfants" (The Children and the Old Tree), tells the story of four children accompanied by a pair of adults who use a thousand and one tricks to prevent the destruction of an old tree.

# Haskell Wexler's Innovative Integrity

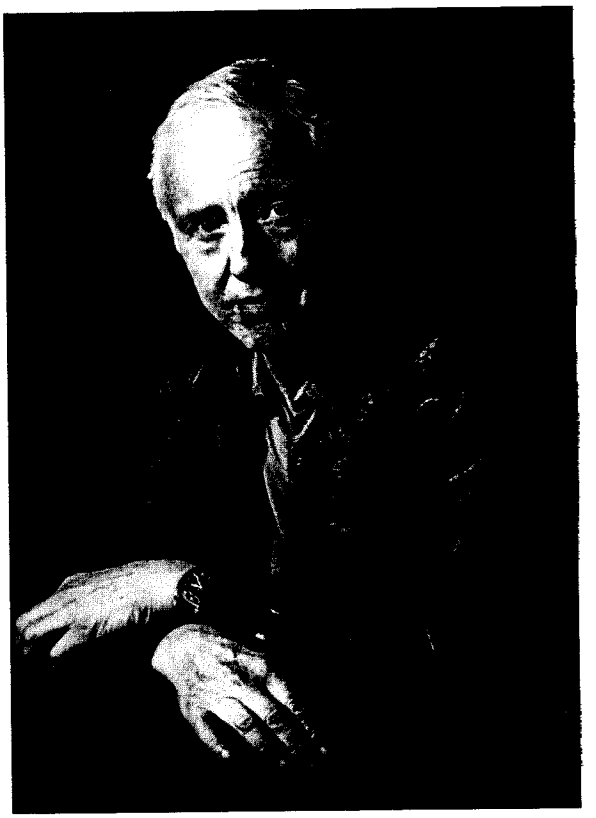
Haskell Wexler recently became the first active cinematographer to receive the American Society of Cinematographers' (ASC) Lifetime Achievement Award. Throughout his variegated career, he has contributed his expertise to films of every conceivable type and scale.

Comfortable using film or video, Wexler spent time just last year shooting a documentary with a video camera about free-lance news photographers who cover the darker side of life. Reality films run in Wexler's blood: he served as either director or cinematographer (and sometimes has worn both hats on the same film) on nearly forty documentaries.

At the other end of the scale, he helped photograph the longest IMAX film ever made, *Rolling Stones at the Max*, a 50-minute in-concert extravaganza that stands as one of the ultimate large-scale moviegoing experiences. He drew upon his work filming *Gimme Shelter* and the 1982 IMAX feature, *Hail, Columbia!*

On the entrepreneurial side of filmmaking, Wexler teamed with Conrad Hall, ASC, another of Hollywood's most respected cinematographers, to form a TV commercial production company that operated for more than a decade. The venture served as a research and development center that explored new ways to combine film and TV as a form of visual communications. In addition, Wexler himself has photographed hundreds of commercials.

The ASC Lifetime Achievement Award is given annually to be cinematographer whose body of work has made a lasting impression on the art form. Although the selection of an active cinematographer is a break with precedent, Wexler's peers felt there was no reason to withhold the prestigious recognition from him until he retired since his work is already considered to have made a lasting impact.



Haskell Wexler Photo by Merritt Smith

Wexler was born in Chicago in 1926. Following his high school years and a year at the University of California at Berkeley, Haskell volunteered to become a seaman in the Merchant Marines during the second World War. He twice survived torpedo attacks while working on tankers in the North Sea. After the war, he spent several months working for his father in a stock room at Allied Radio Company in Chicago. It was apparent that he wasn't a chip off the old block. "Almost in desperation, Dad asked me what I wanted to do," he recalls. "I tried to think of something really outlandish, so I told him I wanted to be a filmmaker."

His father set him up in his own studio, but he realized only a modicum of success. But, in recollecting some of those early experiences years later, Wexler felt that he gained some valuable insight in lieu of financial rewards: He remembers shooting a film in an Alabama factory, where he saw first-hand how people lived and worked in those circumstances. He learned about the unique texture of a realistic look, and also discovered that while the moment of truth in photography is a fleeting and delicate thing, it touches the soul when captured.

*"I tried to think of something really outlandish, so I told him I wanted to be a filmmaker."*

In 1947, he joined the International Photographers Guild in Chicago, and re-started his career at the bottom rung of the ladder as an assistant cameraman, learning cinematography as a craft.

After regularly shooting documentaries through the 50s and early 60s, Wexler photographed *The Hoodlum Priest* in St. Louis in 1961. Although a bit slicker and more stylized than any of his previous efforts, it was underscored with a real documentary grittiness that has become one of his hallmarks.

Wexler reminisces about his "big break" in 1963 as being director Elia Kazan's *America, America.* It marked his first film with a well-known director and became the first feature he photographed using substantial lighting sets on soundstages. "Kazan had seen *The Hoodlum Priest,* and I guess he liked it because he decided to take a chance on me instead of working with a 'regular' Hollywood cinematographer," he recalls.

*The Hoodlum Priest* became Wexler's ticket to Hollywood. In 1964, he paid his dues as an assistant cameraman on several TV series, mainly *Ozzie and Harriet.* After that, he was allowed to enroll in the Hollywood International Photographers Guild as a first cameraman. He subsequently shot his first mainstream feature, *The Best Man,* which starred Henry Fonda. The following year, he added *The Loved One* and a documentary called *The Bus* to his resume.

During preparations at Warner Bros. for *A Fine Madness,* Wexler met Mike Nichols and Harry Stradling, ASC, coming out of a screening room. "I knew Mike from Chicago when he was at [the comedy club] Second City," Wexler recalls. "He was getting ready to direct his first picture. He and Stradling had just watched a screening of Fellini's *8½*. Nichols told Stradling that was the look he wanted for *Who's Afraid of Virginia Woolf?* Stradling articulated what he thought of that idea in very graphic terms. Obviously, they weren't hitting it off.

Soon afterwards Wexler was called to Jack Warner's office, where the mogul told him in no uncertain terms that he was going to shoot *Who's Afraid of Virginia Woolf?* Ironically, after years of doing everything possible to break into Hollywood, Wexler was being told by one of the legendary impresarios of Hollywood that in spite of his commitment to Kershner, he had to shoot a major feature with some of Hollywood's biggest stars, Richard Burton and Elizabeth Taylor.

"I told [Warner] that I had made a promise to Kershner," Wexler says. "He replied matter-of-factly, 'I could make it very difficult for you.' I knew he was serious. So I said, 'Sure I'll shoot *Who's Afraid of Virginia Woolf?*' Later, I asked permission from Stradling. But one of the reasons I made that decision was that Kershner was giving me a hard time during preparation for *A Fine Madness.*"

Wexler broke ground with his use of a single-source umbrella bounce light on *Virginia Woolf.* Every light on the set was on a dimmer. In the book "Masters of Light" (University of California Press), Wexler thanked a gaffer named Flannigan, "who was very, very helpful to me and very supportive. . . he helped me make the transition from some of the things I didn't know about working in a confined studio setting. . . often in films, there are people who work in the crew who are really of immense help. . . you get stuck. . . everybody gets stuck. . . and somebody will help. . . somebody will give you an idea."

*He learned about the unique texture of a realistic look, and also discovered that while the moment of truth in photography is a fleeting and delicate thing, it touches the soul when captured.*

*Who's Afraid of Virginia Woolf?* was the last black & white film awarded an Oscar for cinematography. Accepting the statuette, Wexler told the audience, "I hope we can use our art for love and peace." It was a counterculture statement for the times; the war in Vietnam was still generally perceived as a rescue mission for a struggling democracy. Wexler continued his documentary work with controversial films like *Introduction to the Enemy* and *Interview With My Lai Veterans* (which won an Oscar for best documentary). Looking back, Wexler believes a lot of people were either surprised or offended that a cameraman had opinions about things other than technology. "You were supposed to be non-political, whatever that is," he says.

*"Kazan had seen* **The Hoodlum Priest,** *and I guess he liked it because he decided to take a chance on me instead of working with a 'regular' Hollywood cinematographer."*

In the feature realm, the cinematographer followed *Virginia Woolf* with two films directed by Norman Jewison, 1967's *In the Heat of the Night* (his first color film) and 1968's *The Thomas Crown Affair.* On *Heat,* he stretched silks over the tops of sets and pounded 10Ks into their centers, and also made use of his umbrella lights, which inevitably drew chuckles and comments from the crew and cast. The bottom line was that the black & white/desaturated colors look visually augmented the tone and setting of the film.

*The Thomas Crown Affair* was different; the colors were as rich and vivid as the lifestyle portrayed by Steve McQueen. Wexler also drew on his documentary filmmaking experience to create an environment of reality. For example, he covered the exterior of the bank robbery scene with four hidden cameras, which observed normal traffic and pedestrians both oblivious and reacting to an apparent holdup underway. Someone called the police, who arrived with sirens screaming and guns drawn.

Documentary work had helped Wexler discover how real people react in real situations. "I learned it can be more visually interesting if a main character's back is turned, or an important object or face is partially obscured during a key scene," he says. "It can be very powerful withholding information until just the proper second."

"Movies are a voyeuristic experience," he continues. "You have to make the audience feel like they are peeking through a keyhole. I think of myself as the audience. Then I use light, framing and motion to create a focal point."

During the 1970's, Wexler was listed as a "visual consultant" for George Lucas' *American Graffiti,* which was shot in only 28 nights on a miniscule budget. His other major credits during that decade included *One Flew Over the Cuckoo's Nest, Coming Home, Bound for Glory,* and additional photography on *Days of Heaven,* which won an Academy Award for cinematographer Nestor Almendros, ASC.

Wexler was once invited to direct a film about Woody Guthrie's life. He remembered Guthrie from meeting and befriending him when both served in the Merchant Marines. He declined the offer to direct because of shaky financing and some script problems, but this foreshadowed Hal Ashby's request that he shoot *Bound for Glory* a couple of years later. "I love this type of film," Wexler enthuses, "because it celebrates something that is just wonderful about America. Woody was anti-establishment and much of his life was a struggle, but he really tested the vigor of the democratic process." The film was a landmark for students and movie aficionados because it

*Ironically, after years of doing everything possible to break into Hollywood, Wexler was being told by one of the legendary impresarios of Hollywood that in spite of his commitment to Kershner, he had to shoot a major feature with some of Hollywood's biggest stars.*

was among the first major films to define the use of the Steadicam image stabilizer.

In *Bound for Glory,* there is a memorable scene in which David Carradine, playing Guthrie, strides through a milling crowd at a migrant camp. The camera descends steadily from a viewpoint high above the scene to a perspective directly behind Carradine's shoulder, where it fluidly tracks him as he moves through the crowd. The audience is instantly transformed form a third-party voyeuristic perspective to a participatory POV. *Bound for Glory* went on to win Oscars for both Wexler and composer Leonard Rosenman, and was also nominated for best picture and best adapted screenplay.

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Wexler earned two more Oscar nominations during the '80s, for *Matewan* and *Blaze.*

*Matewan* was produced around the time Kodak put its Eastman color high speed daylight negative film 5297 on the market. Wexler shot 90 percent of the movie with the new film. Only a few other cinematographers were experimenting with it at the time; there are always some risks with a new film. Director John Sayles wanted an ultra-rich look with deep stops, and Haskell figured that using the 5297 film was the way to get it with a limited schedule and small equipment budget.

*Blaze* featured at least 70 shots made with his Steadicam stabilizer with a custom Panavision camera weighing only about 15 pounds. The image stabilizer acted as a shock absorber, allowing the camera to glide along, even on bumpy ground.

Regarding his knack for experimenting and pushing the craft in new directions, Wexler points out, "Our job is full of compromises. You take thrusts into the future by experimenting and hope that they work. If they do, you soar. If they don't you're miserable. The more experience you have, the more it should be possible for you to experiment. What I see and put on the screen is in a sense all I have learned from all of the people I have worked with over the years. There are other cameramen who think of photography itself in a more artistic way. I'm really more interested in where photography leads me. The experience of filmmaking is what I find interesting– and what I can learn from that experience.

"People in this industry speak with a louder voice than the average person. We can make people feel passion, hate, or love because of the potency of our voice. We can't separate the content of the movies we make from the art of recording images on film. It's a great privilege and a great responsibility."

***"Our job is full of compromises. You take thrusts into the future by experimenting and hope that they work. If they do, you soar. If they don't, you're miserable."***

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