

# American Cinematographer

INTERNATIONAL JOURNAL OF FILM  
AND VIDEO PRODUCTION TECHNIQUES

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**DECEMBER 1982**



## PHOTOGRAPHY FOR DAS BOOT

FAERIE TALE THEATER

NIGHT OF THE HUNTER

# American Cinematographer

INTERNATIONAL JOURNAL OF FILM  
AND VIDEO PRODUCTION TECHNIQUES

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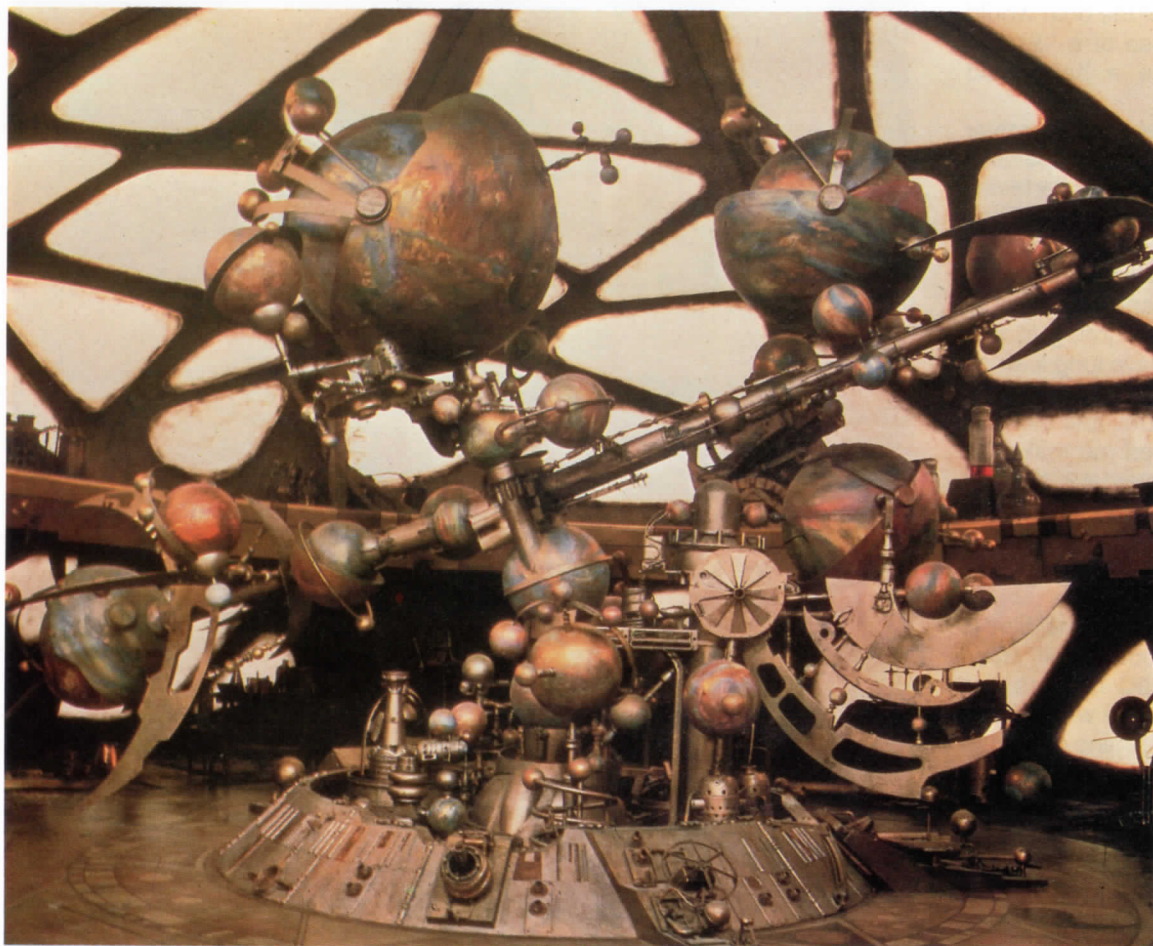
## ON THE COVER

The Skeksis perform their power ceremony in the Crystal Chamber of the castle of the Dark Crystal. THE DARK CRYSTAL was produced by Jim Henson and Gary Kurtz, directed by Jim Henson and Frank Oz, and photographed by Oswald Morris, B.S.C.



# CREATING A WORLD FOR THE DARK CRYSTAL

by DAVID W. SAMUELSON & ANN TASKER



*The fantastic orrery, a mathematical representation of the solar system, inside the observatory of Aughra.*



THE DARK CRYSTAL is a fantasy adventure inspired by myths and fairy tales which represents an attempt to do on film something comparable perhaps to what J.R. Tolkien did in writing THE HOBBIT. It involves the creation of an entire world filled with bizarre creatures and magical landscapes, a world with its own history and civilization but without any human inhabitants. It is an archetypal story of a quest involving a conflict between forces of good and evil in a time of crisis, and its impact depends on the richness of texture and detail.

Such a film is an ambitious undertaking to put it mildly and most people would assume that it could be done only with very elaborate animation. THE DARK CRYSTAL, however, is not an animated film. It was shot live action with creatures walking around and talking to each other on sets at EMI Elstree Studios, and the creatures are not simply actors wearing costumes. They are incredibly sophisticated puppets, some of which required 5 operators using radio control or a variety of mechanical, electrical and hydraulic control systems.

The person who conceived this project and probably the only person in the world audacious enough to pull it off was Jim Henson, the creator of The Muppets. At first sight the Gelflings, Skeksis, Mystics, Garthim, Landstriders, et al. of THE DARK CRYSTAL are a far cry from Kermit and Miss Piggy; but the techniques used in the design and operation of the puppets for THE DARK CRYSTAL

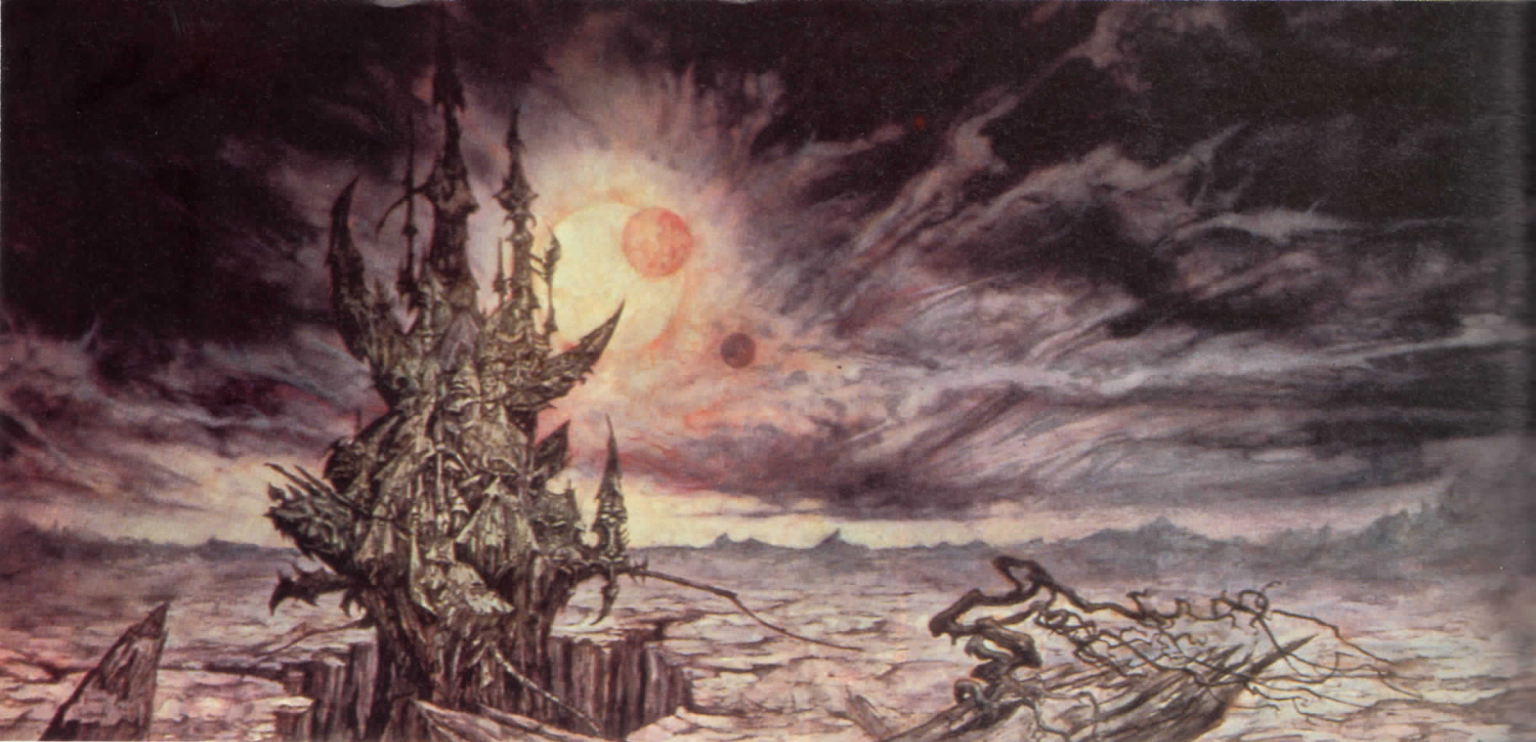


*These heiroglyphics on the Gelfling ruins tell of a prophecy that the Skeksis will be overcome by the Gelfling. It is the only thing feared by the powerful and despotic Skeksis.*

*Kira with two of the Pod People in the Pod village.*







*The castle of the Dark Crystal, its grandeur buried under ages of filth and decay, rises above the desert. Drawing by Brian Froud.*

are an extreme evolution of the techniques Henson developed with The Muppets. Yoda, who was performed by Henson's partner Frank Oz, represents a state in the development of these techniques, and it is no accident that Henson's co-producer on THE DARK CRYSTAL was Gary Kurtz, producer of THE EMPIRE STRIKES BACK.

Henson began working on THE DARK CRYSTAL in 1977. He started with a sense of the kind of world he wanted to create and began visualizing creatures before he really had much of a storyline. One day Jerry Houle, vice president of licensing for his company, showed him a book called *The Land of Froud*, which was an anthology of drawings by Brian Froud. Froud is an English illustrator



*Character concepts by Froud. (ABOVE) The Skeksis. (BELOW, LEFT) One of the Mystics. (BELOW, RIGHT) A woodland creature.*

best known in America for his work on the bestseller *Faeries*, and Henson saw in his work the style that he felt was needed for THE DARK CRYSTAL.

Froud recalls their collaboration:

"He was, I think, looking for something different to the style he had been working in and it is interesting to discover how different it was. Whereas the Muppets are very simple bold shapes, what I designed was very complex and complicated. It was, I think, an amazing leap into the unknown and an enormous act of confidence on Jim's part to imagine that it could work, because I didn't know.

"We started off with a small group of people in New York, just talking about what the world might be and what the creatures might be in this world. Jim had a fairly strong idea about what the Skeksis might be. They are the evil creatures, and he





(RIGHT) A preliminary conceptual painting by Harry Lange, production designer.

(BELOW) Some of the early conceptual sketches of the Skeksis characters by Froud.



felt that they were reptilians dressed up in very extravagant and opulent clothes, living in a castle. They were fairly easy for me to design, but then I had to populate the rest of the world and that was sort of unknown to Jim. So sitting around in a small group of people we would talk about not necessarily what the creatures might look like but some of their personalities, where they might be placed in this world and what they might be doing. It was like a community effort or a discussion group. I would be sitting doodling away, just making the sketches, and people would say yes and no and what things were working. Then, eventually once the broad basis was worked out, it became specific and I did more finished drawings for all the creatures. I was responsible for the conception of an entire

*Continued on page 1316*

The woodland settings have the intricate detail that made the great fairytale illustrations of Gustave Dore and Arthur Rackham so effective. This pre-production visualization by Froud shows why.









A technician makes preliminary tests of the armatures of the Jen and Kira characters. The "tendons" of this arm are intricate enough to allow full play of individual fingers.

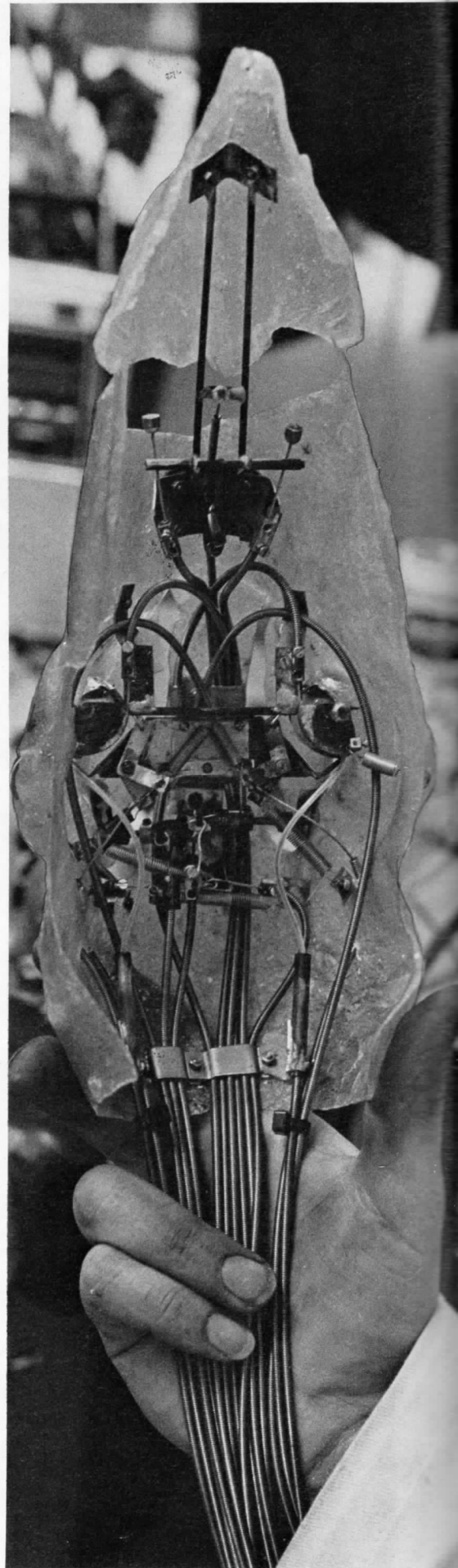


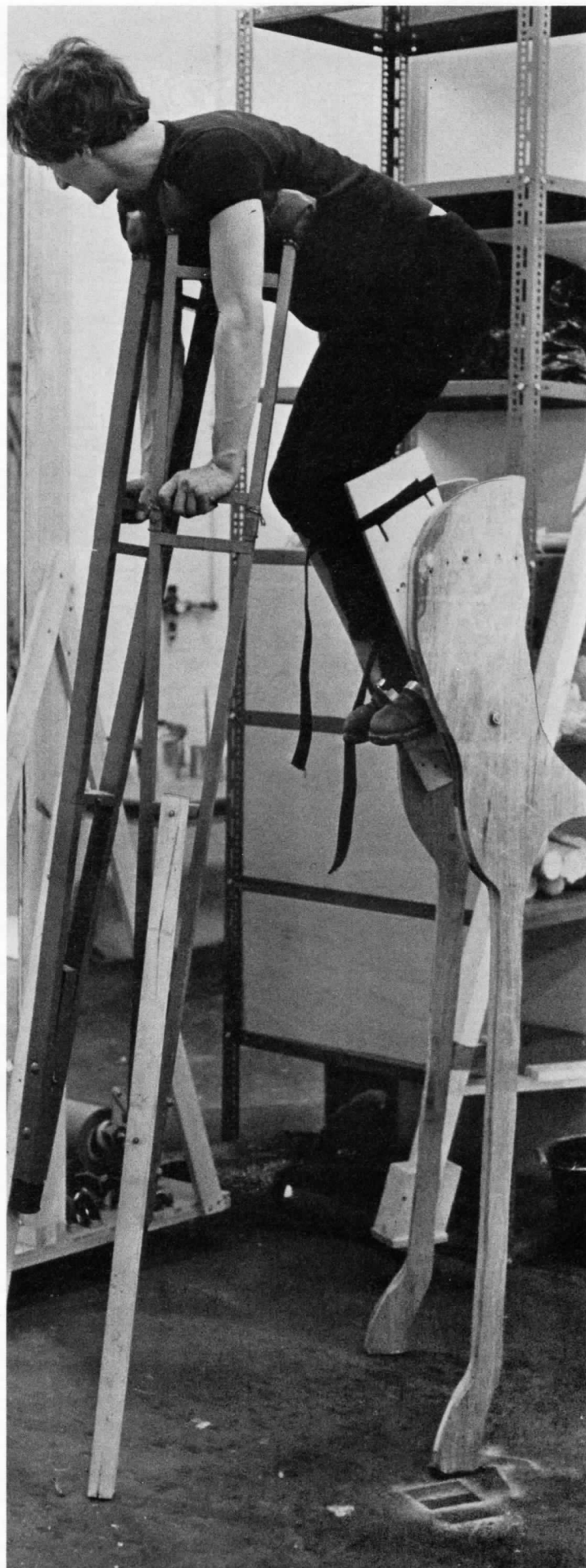
(OPPOSITE) A gallery of puppets created from drawings by Brian Froud and sculptures by Lyle Conway and Tim Clark.



Two sculptors prepare a prototype of one of the monstrous Skeksis, translating the conceptual drawings into three-dimensional characters.







(OPPOSITE PAGE, TOP LEFT) A Skeksis head showing the baroque details that give it an appearance of malevolence. (OPPOSITE, RIGHT) The inner workings of the Skeksis skull are complex. (OPPOSITE, BELOW LEFT) Two of the Pod people unclothed. The spongy "flesh" covers a skeleton-like armature. (ABOVE) A technician assembles the beetle-like armor of a Garthim. (RIGHT) A designer tests the stilt-legs of one of the great Land Striders.



world, a world that had never been seen before. I had to design everything. Not only the general look of the world, from skies to the landscape, but down to the smallest detail which included things like knives and forks, pots and pans, the everyday minutiae details of the creatures that lived in this world.

"In theory, when you are given total freedom to design a new world, a world that has never been seen before, you think you can create it in a totally different way than our world is, that one could design skies that were different in colors and landscapes that look totally different from a landscape we have in our own world.

"In practice, it doesn't quite work that way. For instance we decided that this world, the world of the Dark Crystal, would have three suns. This was a very nice conceptional idea, but if we carried it through logically it became a problem because it would mean there would be three shadows. This was almost impossible to film because it would be very confusing.

"If skies were designed a certain color what would that mean to the colors on the landscape? I think the

danger is that things would look too alien, you have to make the world accessible. It has to be what I would call familiar. I think what I did was to assimilate an English landscape into a fantasy world.

"It has a reference to other landscapes in other countries—I think there is a lot of the American landscape in this film—and yet, really I took it from where I live, which is in Devon. I tried to create a world that was timeless, and in doing so I think I placed it at once in the past and also in the future. There are a lot of historical references that cannot necessarily be pinned down so you never know quite where this world is or what its time period is supposed to be.

"I think generally I look backwards, back in time for my major references because personally I believe that fantasy is partly nostalgic. Even future looking fantasies, like STAR WARS, to me seemed to be dwelling on things that are myths, and it is just an old story transcribed into a future setting.

"I suppose in creating a world like we did, we had a role that was very similar to God, but we very rapidly found that God had all the best ideas already. It is really difficult to improve upon nature and we did spend a long time in fact looking at a lot of natural history films to look at movement and different designs of creatures.

"I did a lot of research for the film, because we had to create a whole world, a whole system that worked, I looked at a lot of different cultures across the world and took various aspects from there and assimilated them, hopefully, into some cohesive whole.

"I think in doing the research I found that every system, every different religion and every culture is based on the same essential truths and hopefully, if this film can put across anything, it is saying that we are all the same, we all live in the same world, we all feel the same things, all our different religions are saying the same thing and hopefully we can achieve out of the conflict we have at the moment some sort of harmony. I know that sounds very heavy, I do genuinely believe, looking back on retrospect of what we have done, that that is the way it went."

Froud worked with Henson and his group in New York for two years before the operation moved to London. Once their ideas had developed to the

point where they had a storyline, David Odell began working on the screenplay. As the designs for the creatures were refined, a small group started working on the realization of Froud's drawings as puppets. The first step was to sculpt a model of a creature in clay, and then the sculpture was used as the basis for constructing a working prototype of the puppet. When the production moved to England in July of 1979 (so that

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had a role similar to God,  
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the best ideas already.*

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Henson could simultaneously supervise the production of first "The Muppet Show" and eventually THE GREAT MUPPET CAPER) the "animatronic fabrication group" grew from seven to 60 people.

The creative supervisor of this group was Sherry Amott. "My job was to get the ideas from Jim Henson, Frank Oz, and Brian Froud, discuss them with Brian, and then identify and find someone to do it," she says. "I had to depend very heavily on the input from the puppet-makers we brought over from New York as to how they thought things should be fabricated. I would have to understand the whole process before I could pinpoint what we were looking for. I looked in places where you wouldn't expect puppet-makers to be. I looked at jewelry makers and watch repairers to be mechanical designers; dollmakers and pottery and ceramic majors in art school became our best mold makers. I was looking for people with a whimsical inventiveness combined with an interest in, say, pottery and electronics, or working with fabric and carving wood. It was the combination of the various skills and interest that strengthened the group enormously and made it flexible. Also, it avoided having extra-neous people doing only one thing."

When a clay sculpture of a creature was completed, a mold was taken from it and used to produce a flexible latex version of the creature. Wendy Midener-Froud, one of the sculptors on THE DARK CRYSTAL, describes how the idea of using latex foam for the puppets' skin developed in the course of making a prototype for Jen

and Kiri, the Gelflings who are the central characters:

"The first 'head' I had was a hard latex under-structure with a chamois leather skin over," Wendy says. "It looked interesting and was a nice texture but it didn't move enough. In the beginning we didn't know whether the creatures were going to be able to do anything, but I think it was Jim who heard of using latex foam and Dick Smith came in and worked with us for several weeks." (Dick Smith is one of the top make-up specialists in this field and was involved in such films as ALTERED STATES and LITTLE BIG MAN. Stuart Freeborn, who created creatures for STAR WARS and THE EMPIRE STRIKES BACK, also gave help and advice in this area.) "Then I went off to work on Yoda for THE EMPIRE STRIKES BACK and that was the first time anyone had used a total latex skin for a puppet, so he was an experiment for us in this film."

Tom McLaughlin, head of the of the foam lab for THE DARK CRYSTAL, estimates that four tons of latex were used by the lab for fabricating the puppets, and each character in the film required slightly different characteristics in the foam. A great deal of experimentation was done. "We came with some things I didn't think possible," explains McLaughlin. "Like getting a highly plastic foam without the addition of oil. Oil is a plasticizer and has been used in the past to make things more flexible, softer, but oil in any piece of casting you are going to turn into a puppet will wreak havoc when trying to get things to adhere to it. This is something I came up with while working on The Muppets."

McLaughlin's work begins when the sculpt is completed. The heads, hands and feet, etc. are sculpted in oil-based clay and then sent to the molding department where a two-piece mold is made. This is returned to the sculptor who makes a core. "We stick clay in the mold which will be the thickness of the foam skin," Lyle Conway, one of the sculptors, explains. "We test that to make sure it is thin or thick enough to allow the mechanisms involved to move, then it goes back to the mold-makers and they cast a plaster core. The mold is separated and the clay peeled out, the foam is poured in and the core pushed in ... the foam takes the place of the clay. This all takes two or three weeks depending on the com-



plexity of the mold."

The foam lab work involves a battery of kitchen equipment as the foam is whipped up in household mixers. "We do have a large industrial mixer for large body parts," McLaughlin says. "This can mix up about four gallons at a go." When the foam is in the mold it is then placed in an oven and baked. "We whip the amount of air we feel the piece will need into the mix," McLaughlin continues. "Once it is nice and smooth the molder pushes it, shoves it or shoots it into the various mold parts and we bake it for anything up to three hours, very much like a cake. We have seven ovens and during our busy time we would use them all, they were going 18 hours a day."

The creatures had to be lifelike, flexible, movable, and lightweight. They had to be easy to get in and out of, in case of fire, and also be able to accommodate a small video underneath which the performer could watch. "Before THE DARK CRYSTAL there had been a lot of big creatures built on backpacks," says Amott. "But this was heavy, and it was difficult to lift your arm to work the puppet. So we decided to build the costume on a harness, which allows

the weight to be carried on the hips.

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*The most difficult item on  
Sherry Amott's shopping  
list was eyes.*

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"On Jim's suggestion, I tracked down a Steadicam harness, which was developed to support a Skeksis. The harness had a quick release for a camera. The prototype was taken into the production stage, and the mechanical designers turned out about twenty. This was an original idea of Jim's that turned into something we couldn't do without. It will become the basis for future puppets, I am sure."

The most difficult item on Sherry Amott's vast shopping list for the film was eyes. "Rubber was our biggest item," Sherry says, "but it took us longest to find eyes for the characters. They just don't exist. The eyes for stuffed animals that taxidermists use are half-round and come in standard types: lizard, dog, and so on. Then there are makers of artificial eyes for humans, which are generally cup-shaped to conform to the eye muscle. What we needed was almost

a sphere in order to have eye movement, and these had to be custom-designed. The size of the pupil was particularly important, as far as focusing the eye line of the puppet, since it is the connection between the eyes and the camera that makes the characters come alive.

"We went to the people who make eyes for Madame Tussaud's. They produced glass-brown eyes, very fragile and difficult to put mechanisms in. Because the process prevents you from controlling the pigment, you can't achieve special colors. Brian wanted red irises, and they couldn't do that. We also went to an artificial-eye maker. She started off quite well, but she had a lot of patients and felt she should really give her time to them, so we ended up with a company that makes artificial eyes. They had to be of a certain plastic that was hard and could be polished; milky-looking eyes don't reflect or look alive."

The adaptation of Froud's drawings into workable puppets was a process of evolution and compromise over several years. Knowing when and how to compromise, what limitations to accept in the movement or expressiveness of each puppet, was

perhaps the most difficult aspect of the process. As Kurtz puts it:

"It's very easy to get into the King Kong syndrome, which is the need to be able to do everything and then you have it so complicated that it's difficult to do anything. We were always trying to balance a simple enough operating mechanism that four or five people could operate all the functions and yet complicated enough to give us the range of emotions that we needed to convey. After some testing on prototypes we rejected some ideas and accepted others but came up with, I think a good balance. Then a team of people was assigned to each creature with a primary performer, we call them, whose job it was to create the personality of the character, just as an actor would create a role, and then work with his team of people, whether it was two extra people or four it didn't matter, to then create the movement properly for that character in rehearsal.

"If they had any eccentricities or unique qualities that would be used throughout the picture then that had to be developed to such an extent that when they got into rehearsal for a scene they would all remember how the creature moved or how it turned its head or how it blinked or if it had a funny walk or any of the idiosyncrasies that a normal personality would have. They spent a lot of time on that aspect of the picture before we even got to the shooting stage."

The performers who brought to life the main characters and creatures in *THE DARK CRYSTAL* were drawn from the Muppeteers, but the Mystics and many of the other characters were created by a specially formed group of mime artists, actors, dancers, acrobats, clowns. Jean-Pierre Amiel, a mime artist well known in Europe, established this group of ten performers which complement Henson's nucleus of puppeteers.

Gary Kurtz recalls how the creatures came alive on the set: "The magic of the film for us, for me especially, was after all the rehearsal time and all those years of development to see the characters come alive on the screen and to have the film crew relate to them as characters although they knew they were being performed by all these other people. On the set in between takes they would talk to them as characters especially with some of the friendlier characters who were really pleasant to work with. They came alive be-



cause of the diligent rehearsal of the performers who had worked on it so long that they were all anxious to see it turn out as well as possible.

"There were nine Mystics and nine Skeksis and we had to have enough people to operate the all at once because in several scenes you see them all on the screen at the same time. In the case of the Mystics, they are large enough to have people inside, sometimes two people, depending on what it had to be in addition to outside manipulation of various aspects of the character.

"So because of that we had very small video monitors so the people inside who were manipulating things could see what was going on or at least see what the camera was seeing, and that was a great help.

"The position that these people had to maintain, especially in the Mystics, was so difficult that we had about a four week training period of gymnastics just to get them up to a position they could do that sort of stretch and stand without getting cramps. It was very difficult for them but it worked out quite well.

The sets for the film were designed by Harry Lange from sketches by Brian Froud. They were, of course, built to the scale of the puppets and had to be designed to facilitate the operation of the puppets. The object was to photograph the puppets just as though they were live performers. The principal performers for each character actually spoke the dialogue during filming, although the production track was only used as a cue track for looping later on. The sets were built up off the floor so that there would be room for the performers and their gear underneath. "In the larger scene, says Kurtz, "where we had ten, twenty or twenty-five characters on the screen at the same time, you can figure there were at least a hundred performers that we had to hide somewhere. It was not always easy and sometimes it was a bit like Grand Central Station."

The key to being able to shoot THE DARK CRYSTAL effectively was a storyboard. Kurtz comments:

"We knew from the very beginning that the creatures were going to be limited in what they could do. So every sequence had to be carefully storyboarded and had to have six or eight months of work with several artists that went through them sequence by sequence and laid them out as the script indicated.

"We would study them and try to decide how we could meet those restrictions of the creatures. The storyboard artists were not concerned with the limitations of the creatures, they just drew them out and we worked on the sequence as if human actors were doing everything. Then, after we could put them up on the wall and see them all, we could decipher certain things that could not be done and would have to be shot in a different way to hide things. Then we would re-draw those storyboards so that we ended up with a sequence of what could be done shot for shot.

"Those were drawn before some of the creatures were finished so that we could incorporate some of the ideas about certain things that had to be functional on one particular creature that might not on another, but even that wasn't always enough.

"We did some rehearsing on video to test whether the ideas worked or not because in a lot of cases facial expressions and eyes were the most critical thing to bring life to the character."

In one sense every scene in THE DARK CRYSTAL is a special effect because of what was required to make the creatures appear alive, but in addition to the puppet work there were special mechanical effects supervised by Brian Smithies and special photographic effects supervised by Roy Field. Kurtz obviously brought to the picture a strong background in special effects and he describes the approach to the effects on THE DARK CRYSTAL:

"We started with special effects very early on. We knew we would have to have some miniatures, some matte paintings, a lot of optical composite work and some blue screen work. We did a lot of storyboards for the art department of the technical shots. We decided to build the Dark Crystal Castle in two miniature sizes, one about 10th scale and one about 25th scale so that we could build a fairly large landscape over Stage 7 with mountains and terrain and put the castle in the middle. Because we had 'power surges' as we call them coming along through cracks in the ground, we had to photograph multiple passes on the miniature and where we decided to photograph the landscape in lightning flashes we had to photograph slow time to get a proper exposure. Sometimes there were four or five passes through the camera before that aspect of the min-

ature was finished and to that we would add the sky which was mostly done with a cloud tank. We spent several weeks doing cloud tank skies, various kinds of stormy skies and clear skies all slightly weird in coloration and cloud formation just to make the world a little more unique.

"We had several matte paintings which were executed by Industrial Light and Magic in San Francisco and for that we provided, in most cases, foreground elements. We were going to shoot some of them on VistaVision but decided that for this purpose, as they were long distance travelling shots and most of the elements would be matte painted in, we could get away with using Panavision foregrounds. We did and they worked out quite well, although I normally prefer to use VistaVision for the elements. In this case it was easier for I.L.M. to composite the material because they were doing other work at the same time with their VistaVision printers.

"In addition to the matte paintings we did several key miniatures which were matched in with live action foregrounds and with cloud tank skies. We also did some composite work, which was very unique, in that we did some superimposition of creatures

that were matched into position with some special holdout mattes that gave us a slightly ethereal feeling.

"We have a sequence at the end where these creatures have to be very translucent and glowing, and they were done by shooting the original elements against black velvet and then matting them into a miniature of the crystal castle rooms. The crystal shard hanging in the centre was a separate matte element so we ended up with sometimes seven, eight, nine, ten, elements with all these creatures in this room, each one photographed separately and put together in the right perspective, which was a real chore. We were able to use video quite effectively all through the picture, especially with the special effects, but because it won't line up exactly right it's not the same thing as putting a punched frame in the aperture. It did allow us to see a rough mix of the vague positions of the elements in the frame. We could play back the first element that had been shot several weeks before and mark on the video monitor with grease pencil the approximate position of it and then put in the new element live on the floor and look at the two video taped together and see if their position in

the frame was close enough. It was good enough for lining up purposes for our shooting because as long as the images did not overlap and they could appear to be talking to each other we felt we were fine. We built a special video set-up for this picture which was completely portable and had two U-matic recorders, a switching network and a special effects generator incorporated so that we could insert a picture from one camera into the image of another. If the Panavision camera was shooting a fairly wide picture and one of the performers wanted to see an eye movement, we could have a band of Panavision in the top and bottom of the picture and insert a close-up of one of the creatures in the center. We could put up to three or four cameras if we wanted to and record that as a master. Sometimes we had 25 monitors on the stage at one time.

"In addition to the miniature of the exterior of the castle built in a landscape, which were fairly straightforward, we had the interior of the crystal chamber in which for the climax of the film, the stonework was to fall away to reveal the crystalline structure underneath. The way in which it is done is the full size set,



which had to match, was photographed quite carefully and then smaller pieces were made, and various small bits, then attached to the perspex crystal room that had been built up previously and lit from behind.

"The only way we could get the stonework to fall away effectively was to shoot at very high speed, so we brought in a 360 frames per second camera to shoot the falling away and set many many explosive charges all around the plaster stonework so that it would fall apart in small enough pieces for this scale to work. We had to try it several times

with wires running all over the stage to get the sequence of explosions correct and make the stonework break away because it could not look like an explosion. It had to look like an earthquake collapsing the material and so the explosions had to be very very small just to jar the attachment points loose so then the material could break away and fall on its own.

"That was probably one of the more complicated of the interior miniatures. We had to use that same crystal chamber miniature for the interior set for the very end of the film because there was no full size set

built of the crystal interior, that was all in miniature. The characters were all shot either against blue screen or black velvet and had to be properly placed in that miniature background by the perspective indicated on the storyboards so those shots were analysed and lined up very carefully.

"The video was also a great help there because it gave us a better idea of what the proper perspective would be. We could run the background and look at the perspective on the foreground and see whether it matched up reasonably well.

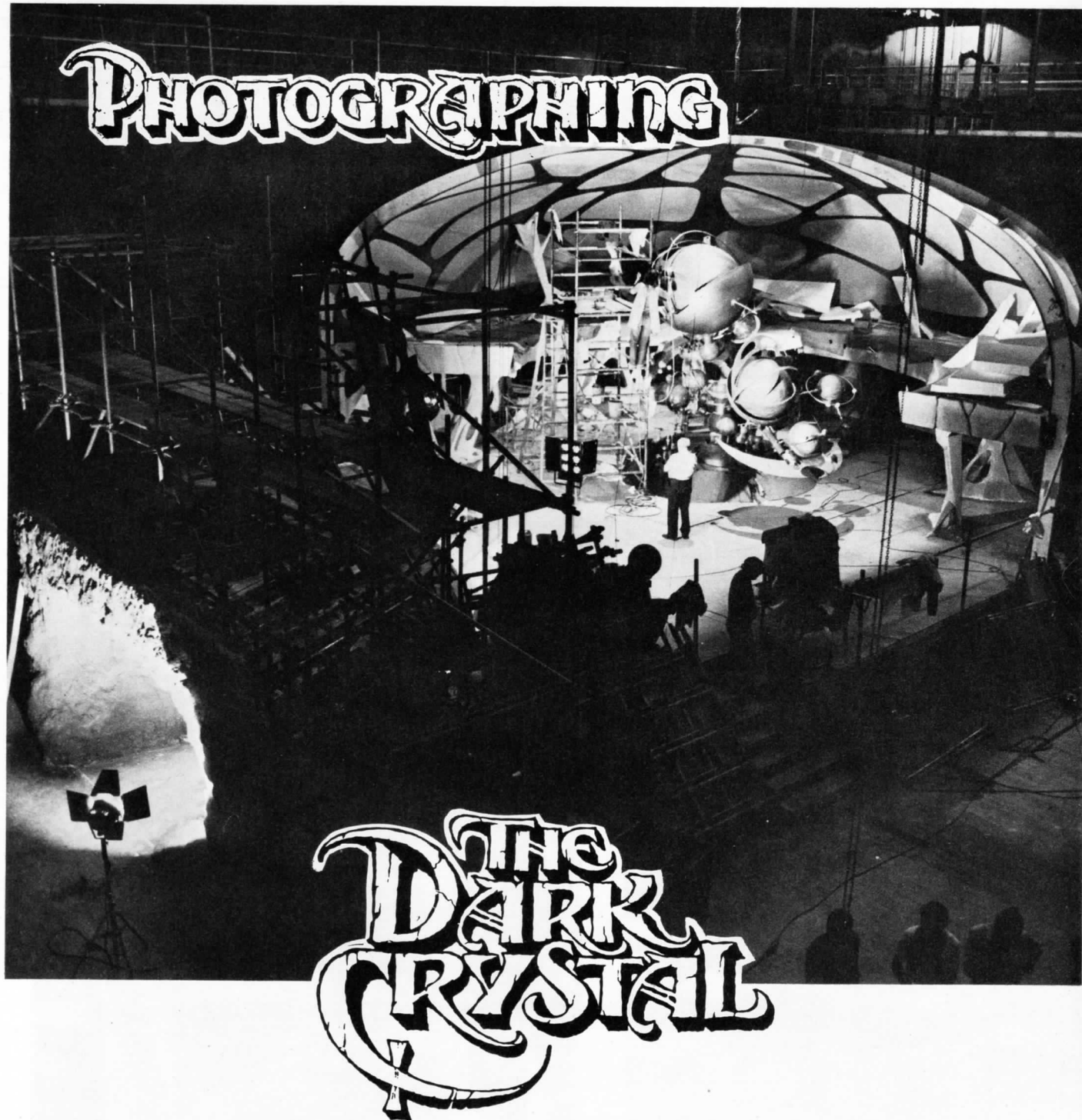
"From an overview of the picture the biggest challenge was to shoot the film in such a way that none of these things were noticed. The actors moved where they had to move and said what they had to say and presented the drama in such a way that you would assume that they were just regular performers, and I think to a great extent that was achieved. We had certain limitations, certain scenes we had to cut around, things that didn't quite work, but for the most part I think all the scenes come across as fairly normal scenes and if human actors were being used they would have had been shot in pretty much the same way and that's really what we were after."

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Some eighteen months before THE DARK CRYSTAL started principal photography I received a phone call totally out of the blue, asking me to meet Jim Henson and Frank Oz for dinner. An unusual film project was to be discussed, and they thought I might be interested. I cannot honestly say that my reaction to that phone call was totally enthusiastic, but as much out of courtesy as anything else I agreed to journey to London to meet them.

by OSWALD MORRIS, B.S.C.

Jim and Frank revealed to me their idea of a movie to be called THE DARK CRYSTAL. I listened intently to all they had to say but still cannot honestly admit, even at this moment, that I was all that enthusiastic. However, on previous occasions I have had the same reaction to new projects and therefore felt it prudent to ask for time to consider what I might do.

At home, I talked at length about this with my wife and slept on the idea for many days. Even then I can't honestly say that my thoughts about the movie had changed, but I did agree to a second meeting with Jim and Frank, where the movie was discussed in greater detail. I could begin to see the ideas that were being thought about, and I asked for one more brief respite before making my final decision. The idea at that stage was for a two movie project, THE



DARK CRYSTAL being the second of the two movies and THE GREAT MUPPET CAPER being the first one.

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*THE DARK CRYSTAL is one of the biggest and most difficult movies I have ever been asked to photograph.*

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Jim felt that if we were going to undertake so vast a project as THE DARK CRYSTAL it was necessary for us all to work together as a team

ahead of time, and this proved to be totally justified.

I then quite confidently made up my mind that here was something I just had to try. I had never before photographed, certainly the Muppets, nor any form of film puppetry, and it seemed to me that the challenges were enormous.

The plan was to work during the summer, before either movie started, carrying out exhaustive tests for THE DARK CRYSTAL, which was to be the second movie, but at the same time preparing THE GREAT MUPPET CAPER, by way of looking for locations, etc. This was the plan that was finally adopted, and on reflection there is no doubt in my mind that it worked.

During the summer a lot of time would be spent testing various as-

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*Highly imaginative cinematography was necessary to bring to life the previously unseen world of THE DARK CRYSTAL. (TOP) The funeral of the Emperor of the Skeksis in the great, decaying castle. (CENTER) The Mystics on their trek from Mystic Valley to the Skeksis castle. (RIGHT) Jen, Kira and Fizzgig make the treacherous crossing over Black Lake. (BELOW) After escaping from the deadly Garthim, Jen falls asleep in Kira's arms.*





pects of THE DARK CRYSTAL both for mechanical innovation, set design and for me, most importantly, color rendition.

THE DARK CRYSTAL, being a fairytale, is probably to a cameraman one of the most difficult types of movie to photograph. It is difficult

because there is no visual yardstick whereby each and every member of the unit can talk with the same basic understanding. By that I mean, visual realism. A fairytale is not real, it is an interpretation of a story which is probably different in every person's mind.

If I may use the word 'ordinary type of movie' I do not mean either to

denigrate the many wonderful movies that have been made, nor do I wish to exaggerate the importance of THE DARK CRYSTAL, but, it is a fact that with a common visual denominator running through a story, life becomes that much easier for the cinematographer. This was not the case with our particular movie.

I decided at an early stage that the description was not the best way of conveying any idea that I might have to the producers and director. The only way was to do cinematic tests, show the material on the screen and ask them for their comments. We adopted this pattern right from the word go, and I think it was the only way forward at the time.

The designers of the various puppets would produce any that were near enough to be tested and the production design team of Brian Froud and Harry Lange would also build a small part of the set into which that particular character was going to be placed. I would then add my part by way of lighting and cinematographic effects to complete the effect. We would look at this on the screen, discuss it in great detail, and then either accept it or agree to further tests.

We did this throughout the summer, and I well recall that the tests became more complicated, more daring and more interesting as we got our teeth into the project and also as we got to know one another's thinking. At the end of summer the main unit left THE DARK CRYSTAL to carry on and make THE GREAT MUPPET CAPER while the backroom boys carried on with their testing of these very complicated figures.

Several times during the shooting of the first film we would do tests connected with THE DARK CRYSTAL and I well recall the admiration that I had, and still have, for the hard work that Jim Henson and Frank Oz put into the task of trying to make two movies at once, because this is really what happened.

Although we were hard at work making THE GREAT MUPPET CAPER, there were just as many people behind the scenes preparing THE DARK CRYSTAL.

There was a lapse of some six weeks between the completion of the first movie and the first day of principal photography on the second, but that six weeks was probably more hectic than anything that we had experienced so far.

## LIGHTING THE DARK CRYSTAL

**John Harman, the electrical supervisor on THE DARK CRYSTAL, describes the lighting of the picture from his point of view:**

Two days after Ossie came back from Albuquerque at the end of THE GREAT MUPPET CAPER, he phoned and asked if I would come down to EMI studios to look at the half-built sets for THE DARK CRYSTAL. I met him on Stage 3 and he went through what we were to do. He sent me off to the art department to get all the various drawings, and I went home to work out how we were going to do it. I did the drawings at home and worked out the loads we required on DC and the other things that we required on AC.

We started on Stage 4, which was a very big set. Ossie lit it with 1306K space lights, from above, as a basic light. I built boats round the set and filled them with 100 10Ks, stacked in pairs one above the other. We also had three 24K Dino lights plus a large number of 5Ks and about 80 650 watt Jupiters around the floor as well as mini and maxi-brutes in the pit to light up the floor. All of these had to be controlled from one central point.

To all of these we added the colors that Ossie and the art department had decided on: mauves, greens and various other colors which coincided with the same gelatin on the Lightflex. While we were actually shooting on Stage 4 a crew was rigging Stage 3, the Crystal Chamber. In addition to the lights on Stage 4 there were eight 24K Dino lights and four maxi-brutes, 20 or 30 mini-brutes on the stage floor, and eight lightning boxes on stage 3.

The lightning boxes we used

were the standard consisting of two carbons which go together except for this film Ossie wanted to control them all from the camera so we had them made to work off remote control switches. Ossie could operate all eight at once if he wished or he could vary it in shot by having four or six or two or whatever combination he wanted. Also, Ossie wanted a single light source coming down from the center of the set. With all the other lights on it was a problem to get a strong enough light to show up on film, so we mounted an old army searchlight and shined it into a mirror to reflect down onto the center of the stage. With the aid of smoke it registered enough for Roy Field to optically put it on afterwards.

Because of the vastness of the complicated lighting on this picture we spent several weeks beforehand planning with Ossie, rigging the lights and working out the colors. Then we would shoot tests in our lunch break which everyone would look at the next day.

When we started the actual shooting on that stage it would never take us more than about 45 minutes to light any one shot.

On one particular set, the Swamp set, Ossie wanted a lot of depth of field so the lighting was vastly increased in quite a small area. The DC amperage was about 18000 and, because it was confined to half the stage, the temperature on the stage floor was over 100 degrees Fahrenheit. Up near the roof it was somewhere between 120 and 130 degrees.

The electricians operating the lamps would take salt tablets to prevent dehydration and took turns, one hour up there and then half an hour down to cool off.



When I returned from Albuquerque, the last location of THE GREAT MUPPET CAPER, the first big set for DARK CRYSTAL was already being built in the studio and one had to adjust very quickly from Muppet comedy to a totally new type of romantic fairytale. Although we had done numerous tests up until that time, I was still far from happy, nor indeed clear in my mind, as to what style the photography for the movie should take. I had a wonderful rapport with Jim and Frank but I felt, and I know they felt, that I still had not come up with the complete answer to the visual presentation of the movie.

I then remembered the 'Lightflex', a device that I had used on a previous movie of mine in New York. It seemed to me that here was the total answer to many of our problems. Here was a way of taking total reality out of the movie and instituting a type of fairytale photography which was so sorely needed and which I had not thought of until that moment.

The Lightflex is a device whereby color overlays can be laid onto images while they are being photographed and is at the total command and control of the cinematographer. I could increase or decrease the color effects as I so

wished. I could change the colors scene by scene or indeed during the course of one scene I could change color without too much difficulty. I had further consultations with Brian Froud, Harry Lange, Jim Henson and Frank Oz, and we agreed on a pattern of color overlays for the entire picture. These were carefully tabulated and prepared by my assistant, and with this careful preparation we were able to use the Lightflex without causing any delay in the shooting schedule.

The picture opens with Jen living with the Mystics, his foster parents, in a warm, friendly atmosphere of love and affection and the predominant color there is gold. As Jen leaves his home to venture towards the Skeksis Castle, he has many encounters on the way in different locations and each one of these was given a color suitable to the design. For example, in the swamp, where he meets Kira for the first time, this very large set had the most wonderful shade of green, and I very quickly learned that overlays of the same color as the predominant color in the set give the most magical effect. Consequently, a green overlay was used in the swamp.

When Jen reaches the Skeksis Castle and attempts to gain access to the Crystal Chamber we resorted to a purple overlay. In addition very large numbers of colored filters were used both on the lamps and on the camera. When using colored filters in this way I have found it most effective if the filters used on the camera match, or nearly match, the filter on the lamp. It seems to give a translucent magical effect which is exactly what we were trying to achieve on many occasions in the movie. I cannot remember exactly how many filters were used on the production but let me say that the number was considerable.

In the early planning stages of the picture it became clear to me that the sets were going to be very large. Our two principal characters were only 39 inches tall but many of the other characters stretched as high as 7 or 8 feet and therefore scale was going to be a problem and with it, depth of field. I realized that I had to set myself a minimum stop of T4.5 but hopefully I might attain T5.6 or even T8.

This meant lighting in a very high key and by dint of some very hard work on the part of my wonderful electrical crew, this was made totally possible, and indeed for me, an easy task as other people did most of the heavy work.

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Throughout the entire picture we used a pellicle reflex mirror on the Panaflex camera, in place of the more normal spinning mirror. This was to eliminate flicker and give the very best possible TV picture through the camera viewfinder system which was an absolute necessity right from the outset as Jim and Frank can only work by watching their actions on a TV monitor. This is the background to their present enormous success and I was not about to interfere with that.

I estimated the pellicle would require one half of a stop more exposure although the particular one we used only extracted 30% of the light used. You can see that this added to the lighting requirements, but nevertheless I understood perfectly that this was a 'must' as far as Jim and Frank were concerned.

Because the sets were so big, and the schedule demanded that we move from one big set to another, either during the day or possibly overnight, it was often necessary to rig two big sets simultaneously. This of course, stretched the resources of the electrical department in a way that I have never known to be required before, but I must emphasize that this was not careless planning or extravagance on anybody's part, it was a genuine necessity for the production.

Looking back on the list of electrical equipment that I used on the picture I notice that I seemed to avoid using Brutes at any time on the movie. My reason for this was that Brutes have to be trimmed after approximately forty-five minutes of burning time. With people dressed in these most extraordinary costumes it would have been a grave fault on my part if I had caused any delay while a lamp was trimmed as they were showing signs of great discomfort working in cramped, confined conditions.

In place of the Brute I used the new 24x1000 watt quartz 'Dino' Lamp which has not long been used in this country. These lamps, apart from giving out a tremendous amount of light, can also be flooded or spotted at will and filters and diffusers, on very large frames, can be used as well. Furthermore they can be put on dimmers. I have nothing but praise for these lamps; I think they are a great step forward.

On the big sets basic overhead soft lighting was achieved by the use of 6kw quartz overhead space lights with white silk skirts. These lamps, in

large quantities give a very soft, shadowless overhead light, which again, I find invaluable.

Some of the sets, of course, were quite the opposite. They were so small it was not possible to get a camera inside, except perhaps the Panaflex stripped to its barest minimum requirement.

In order to make our working lives tolerable in these small sets, most of them were built on four foot rostrums with removable floor sections so that the working crew could at least get inside them and stand up for their working day rather than have to be on their knees for hours on end. It was in those sets that I realized fully how versatile the design and potential of the Panaflex camera is.

On previous anamorphic pictures with which I have been associated, it has generally been the custom to use no more than three fixed focal length lenses, but on THE DARK CRYSTAL I think I am right in saying that we used almost every focal length available from Panavision from the 30mm to the 800mm.

It has been a year now since the principal photography finished on THE DARK CRYSTAL and that time has been taken up by the enormous volume of complicated technical special effects work that the script required. We had a special effects unit under the supervision of Roy Field, with Paul Wilson as director of photography, and their work had to dovetail into the shooting of the first unit. Conversely we on the first unit had to bear in mind that miniatures, models, painted mattes and optical overlays were all going to be added to certain scenes that we were photographing and this required close cooperation between the two units.

To avoid any misunderstanding, we made it a hard and fast rule that when any shot was being made by the first unit, which was to be supplemented or altered by the model unit, one of the key technicians of that unit was standing by the camera all the time. I well remember the errors I personally would have made had this person not been present.

Throughout my working life I have felt it to be very important that I follow the picture through to the answer print stage by keeping in close contact with the laboratory. This picture was no exception. I have run the cutting copy with the laboratory graders (timers) on two occasions and have followed the creation of the final

answer print at every stage of development.

I have very strong views on this. It seems a pointless exercise to me to spend many weeks endeavoring to create effects on film only to see them misinterpreted, through no fault of his own, by somebody hidden in the depths of the laboratory. I have the greatest sympathy and admiration for these people and I feel that I owe it to them to give them as much assistance as I can at the answer print stage. They are a lonely group of people, desperately in need of help and assistance and it would be an exercise against my best interests were I not to make the effort to attend these laboratory screenings.

THE DARK CRYSTAL is probably one of the biggest and most difficult movies I have ever been asked to photograph. I would be misleading you if I did not say that during its making I have had moments of despair and depression, but on reflection I feel that the end result is probably as good as I am capable of creating and were I ever asked to do the whole thing over again I doubt whether I could make many improvements. ■

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#### DARK CRYSTAL

*Continued from page 1285*

world, a world that had never been seen before. I had to design everything. Not only the general look of the world, from skies to the landscape, but down to the smallest detail which included things like knives and forks, pots and pans, the everyday minutiae details of the creatures that lived in this world.

"In theory, when you are given total freedom to design a new world, a world that has never been seen before, you think you can create it in a totally different way than our world is, that one could design skies that were different in colors and landscapes that look totally different from a landscape we have in our own world.

"In practice, it doesn't quite work that way. For instance we decided that this world, the world of the Dark Crystal, would have three suns. This was a very nice conceptional idea, but if we carried it through logically it became a problem because it would mean there would be three shadows. This was almost impossible to film because it would be very confusing.

"If skies were designed a certain color what would that mean to the colors on the landscape? I think the