

## BEHIND THE SCENES OF

# WESTWORLD

A strange trip through a fantasyland of the future, where, for a price, each person's secret dream can come true—unless it turns into an eerie nightmare



In these latter days, when the name of the game in feature film production is to create an entertainment that is unique and exciting enough to drag the viewers away from the "freebies" of television and into the theatres, a film like MGM's "WESTWORLD" could serve as an example of what it takes. Completely "different" in its premise, and wildly imaginative in its execution, the film combines the highest degree of technical artistry with the salient dramatic elements that add up to sheer entertainment.

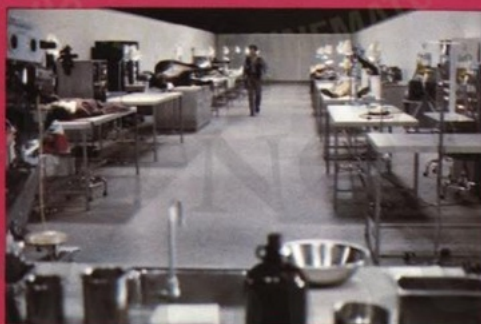
The very name "WESTWORLD" conjures up images of action sequences from movies of the American West. But writer Michael Crichton has not simply told a western tale for his feature directorial debut, but provided Metro-Goldwyn-Mayer with one of the most novel action-adventure movies ever filmed.

Crichton has set his intriguing story in the world's greatest adult playland, Delos, a sophisticated amusement park that is a fantasy world utilizing space-age technology to recreate periods of the past in lifelike detail. Those who go there may actually immerse themselves in the life of a prior period in time. At Delos the periods include Medieval Europe, Imperial Rome and the American West as it was in frontier times—the latter is "WESTWORLD".

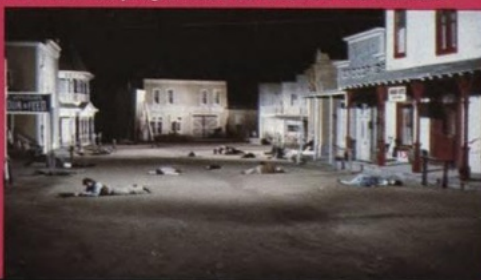
Paul N. Lazarus III produced this highly visual adventure which stars Yul Brynner, Richard Benjamin and James Brolin.

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(ABOVE LEFT) An impressionistic study of the face of Yul Brynner (who plays the well-worn robot gunslinger in "WESTWORLD"), with an intimation of the electronic circuitry that makes him go. (BELOW LEFT) The nerve center of the fantastic adult playland Delos, where technicians observe the robots on monitors and remotely control their behavior. (CENTER) Richard Benjamin walks through the "surgery", where robots are repaired nightly, following the damage inflicted upon them each day by clients. (RIGHT) Brilliant young writer/director Michael Crichton makes his theatrical feature directional debut with "WESTWORLD".



(LEFT) Preparing the banquet hall set for shooting of a sequence in Medieval World. (CENTER) The vast Western Street set on the backlot of Warner Bros. (now Burbank) Studios is "propped" with corpses and lighted for filming of a night-for-night exterior sequence. (RIGHT) Yul Brynner and Michael Crichton talk between set-ups. Brynner was fascinated by the script's far-out premise, which resulted from Crichton's observation of astronauts trained to function like machines, and machines programmed to function like humans.







(LEFT) The imposing castle banquet hall of Medieval World, one of the three fantasy "worlds" of Delos, where clients pay \$1,000 a day to act out their most bizarre fantasies with humanoid robots that cater to their every desire. (CENTER) In true Robin Hood fashion, a sword fight breaks out between two robot knights. (RIGHT) The banquet hall becomes a battleground, as the knights engage in wild swordplay derring-do, in the manner of the late Errol Flynn when he swashbuckled across the screen.

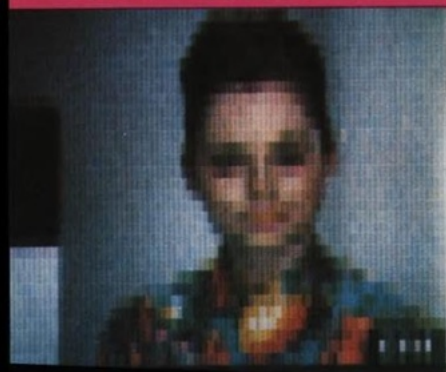


(LEFT) The saloon set in "WESTWORLD", where clients mingle with cowboy-garbed robots and await their turns to shoot it out with the black-clad gunslinger. (CENTER) Moving a crane into the banquet hall set for a boom shot. Crichton purposely employed the conventions of the movies of the Forties, which often included crane shots injected for no particular reason. (RIGHT) Low-key mood lighting and the forced perspectives of wide-angle lenses add visual drama to "WESTWORLD".



(LEFT) Will the real Yul Brynner please stand up? The actor is shown with the head of the robot, life-modeled in plaster cast form from his own face. Brynner wore silver-metallic contact lenses throughout the filming in order to attain the effect of a steely robot-like gaze. (CENTER) Brynner adopts his best bedside manner, as he sits beside his robot alter ego, which is about to undergo surgery of the circuitry. (RIGHT) When the robot's face is removed, the electronic brain is revealed in all of its computerized glory.

Tests for a unique method worked out by special effects expert John Whitney, Jr. to simulate the point-of-view of a robot. The method selected was basically a mosaic made up of 3600 color rectangles per anamorphic frame of film. It involved the electronic breakdown of an image into a series of points, each of which was given a numerical gray-scale value and then run through a computer that translated the digital information into squares with various color tones. (LEFT) A flat frame of a woman's head, with color scale. (CENTER) Squeezed anamorphic frame from one of the Western street scenes out of the picture, as it looks when interpreted in color mosaic terms. (RIGHT) Squeezed anamorphic frame from test in which the scene is rendered in squares of monochrome blue.





"WESTWORLD" is a story of people in jeopardy. Two young Chicago businessmen, Peter Martin (Richard Benjamin) and John Blane (James Brolin) choose to vacation in "WESTWORLD", whose inhabitants are human-looking robots of the period. Malfunctions in the robots cause them to deviate from their programmed roles. The robot gunslinger (Yul Brynner) in "WESTWORLD" becomes the deadliest menace. He kills Blane in a gunfight and stalks Martin through the other worlds of Delos.

Guests pay \$1,000 a day to relive the excitement of the Old West, including the opportunity to engage the gunslinger in a showdown gunfight in which they are guaranteed to outdraw it and "kill" it. Each night technicians repair the gunslinger and other damaged or malfunctioning robots, returning them to WESTWORLD the following morning to repeat their roles as residents of a frontier town.

The electronic impulses which control the gunslinger are so sophisticated, however, that it begins to react to the pleasure which the guests experience through the simulated killings. It gradually emerges from its programmed pattern, stimulated by an electronic urge to shoot back at the guests.

It no longer is willing to be a target, shot at over and over. It wants to do what its enemy does—a super-human reaction to a human act. And the closer it comes to killing, the more the robot experiences a satisfying warmth and becomes more of a human being.

After the gunslinger undergoes its electronic metamorphosis, "WESTWORLD" speeds to a gun duel between Brynner and Brolin, and Brynner's horseback pursuit of Benjamin through WESTWORLD and the two other areas which comprise this vacationland of the future—Medieval World and Roman World. The climax comes in the computer control center where Benjamin tries to match his knowledge of elec-

tronic machinery against the programmed "brain" of the robot.

The various backgrounds needed were provided by desert landscapes in the Mojave Desert, the gardens of the Harold Lloyd Estate and the variety of re-creations performed on several MGM sound stages. Special contact lenses were designed to distinguish the robots from the humans and computer filmmaking was utilized to give an accurate display of the robot's vision.

Writer/Director Michael Crichton is one of the most successful young authors in the United States. Soon after entering Harvard Medical school in 1965, he completed his first novel, "Easy Go", under the pseudonym, John Lange.

Altogether he has written 15 books under four different names. During his third year in medical school he completed a novel on abortion, "A Case of Need" which not only won the Mystery Writers of America Edgar Allan Poe Award in 1968 but was recently made into the successful MGM thriller, "THE CAREY TREATMENT".

Crichton has decided never to practice medicine but has written a non-fiction account of patient care, "Five Patients", based on his experiences at Massachusetts General Hospital.

"The Andromeda Strain" was the first book to appear under Michael's own name. During his post-graduate year at the Salk Institute in La Jolla, the book became a best seller and stayed on the list for six months. Producer-director Robert Wise bought the book and made the film into his greatest success since "THE SOUND OF MUSIC". Soon afterward, Michael and his brother completed a novel about marijuana, "Dealing", which was made into a film by Paul Williams.

Last fall Michael got his first chance to direct for television. Robert Dozier scripted his book "Binary" which Michael directed as a Movie of the Week "PURSUIT". Another book, "The

Terminal Man", was sold for a large advance and is presently being filmed.

Crichton's latest project "WESTWORLD" is an original for the screen and represents his feature film directorial debut.

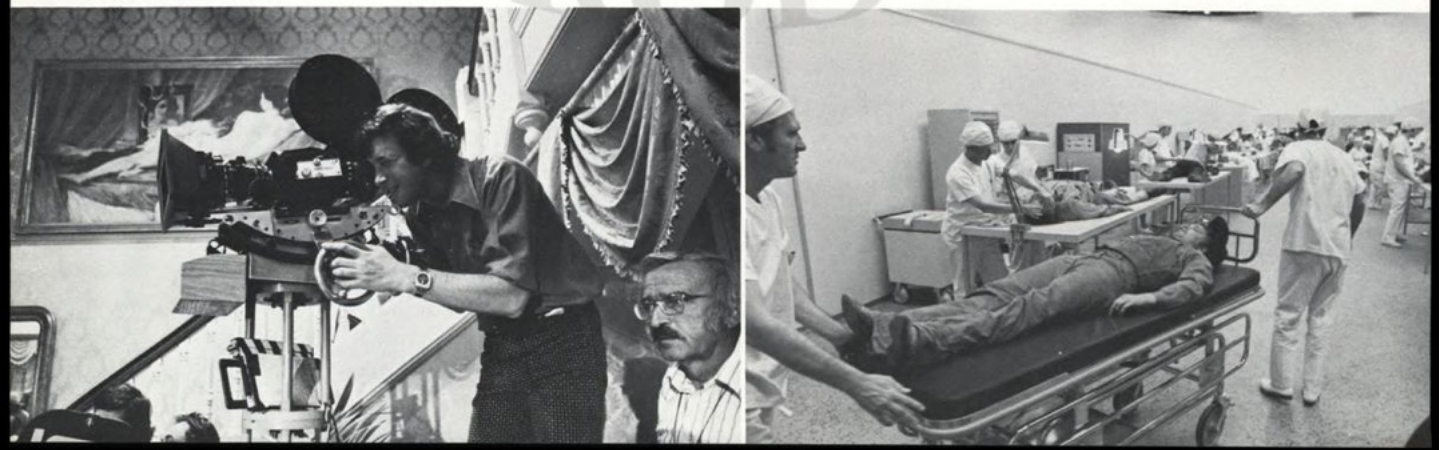
Crichton is fascinated by film and wanted a certain visual style for his film. Cinematographer Gene Polito achieves the style perfectly. Best remembered for his camera work in "COLOSSUS: THE FORBIN PROJECT" and "PRIME CUT", Polito has been receiving well-deserved critical accolades for his bright colorful style.

In the following interview for *AMERICAN CINEMATOGRAPHER*, Michael Crichton goes behind the scenes of "WESTWORLD" to talk about his conception of the basic idea, his writing of the screenplay and his experiences in translating the script into his first theatrical feature, as director:

**QUESTION:** The basic premise of "WESTWORLD" is extremely imaginative. Can you tell me what inspired you to approach such a subject and, subsequently, to make it into a film?

**CRICHTON:** I'd visited Kennedy Space Center and seen how astronauts were being trained—and I realized that they were really being trained to be machines. Those guys were working very hard to make their responses, and even their heartbeats, as machine-like and predictable as possible. At the other extreme, one can go to Disneyland and see Abraham Lincoln standing up every 15 minutes to deliver the Gettysburg Address. That's the case of a machine that has been made to look, talk and act like a person. I think it was that sort of a notion that got the picture started. It was the idea of playing with a situation in which the usual distinctions between person and machine—between a car and the driver of the car—become blurred, and then trying to see if there was something in the situation that would

(LEFT) "WESTWORLD" writer/director Michael Crichton looks at a setup through the viewfinder, while Director of Photography Gene Polito (at right) checks the lighting. (RIGHT) A "wounded" robot is wheeled into the repair facility of Delos, the mythical-multiple playland for adults. The room resembles a surgery, with the technicians garbed as surgeons. Despite the fact that the intricate production ran two days over schedule because of an eye injury to Yul Brynner, it was brought in for \$60,000 under budget.







(LEFT) For a follow shot of Brynner walking down a corridor, fill illumination was provided by bounce light from a one-inch-thick sheet of styrofoam measuring 48 x 48 inches. A PAR-64 "six-lite" lamp was used as the light source. (RIGHT) Three cameras are set up for a multiple-camera shot. Despite increased expense of additional cameras and operators, considerable money was saved by this method, because costly and time-consuming stunts did not have to be repeated to achieve a variety of angles.

lead to other ways of looking at what's human and what's mechanical.

**QUESTION:** I understand that you originally tried to write it as a novel and then abandoned that tack in favor of writing it directly as a screenplay. Why was that?

**CRICHTON:** Well, it didn't work as a novel, and I think the reason for that is the rather special structure of this particular story. It's about an amusement park built to represent three different sorts of worlds: a Western world, a Medieval world and a Roman world. The actual detailing of these three worlds—and also the kinds of fantasies that people experienced in them—were movie fantasies, and because they were movie fantasies, they got to be very strange-looking on the written page. They weren't things that had literal antecedents, literary antecedents. They were things that had antecedents in John Ford and John Wayne and Errol Flynn—that sort of thing. In some ways, it's a lot cleaner as a movie, because it's a movie about people acting out movie fantasies. As a result, the film is intentionally structured around old movie cliché situations—the shoot-out in the saloon, the sword fight in the castle banquet hall—and we very much tried to plan on an audience's vague memory of having seen it before and, in a way, wondering what it would be like to be an actor in an old movie.

**QUESTION:** Is this the first time you've written a screenplay directly, instead of adapting it from one of your novels? If so, what differences do you find in the two methods?

**CRICHTON:** No, it's not the first time. I've done some other original screenplays, most of which have never been

made, but I've written them directly as screenplays. I've also adapted my own books, and I think that the two methods are really very different—more different than most people ever realize. The Hollywood tradition has been to purchase books and stage plays and short stories and then hire a group of screenwriters to adapt them. But the screenwriters, in most cases, were not people who wrote books and stage plays and short stories themselves—so there were very few people who found themselves in the position of writing a book and then adapting it into a screenplay. I think the differences in the two forms are incredibly great, and they go beyond those platitudes that everybody hears about—telling the story in visual terms, and so on. In fact, it often becomes a question of what kind of story you're telling. That's why I feel that, of the books that have been successfully adapted, there often isn't a great deal of the book that is retained in going to the screen. What is retained is a certain feeling, some essential quality that was in the book and that also appears in the film. That's also why I think that you can have a really slavish adaptation that follows the original scene-by-scene, with all of the characters remaining unchanged and everything exactly the same as it was in the book—but it's no good as a movie. Some kind of emotional quality has been lost. I don't think there's any way to get around the fact that to create that emotional quality on paper is very different from creating it in terms of images.

**QUESTION:** Obviously, in writing a novel, you can get inside the heads of the characters. You can tell what they're thinking. Have you found that a difficult thing to translate into visual terms, without falling back on long subjective speeches?

**CRICHTON:** I just think of it as something that you can do well in one medium and not in another. All internal states of mind are very hard to film, because either you have the character say something (which is almost always phony), or you have the character do something to tie in with his emotional state. That's often rather clumsy and awkward and certainly time-consuming. It may take you quite a long time to convincingly show that the character is depressed, in terms of our almost cliché conventions with the audience. The audience will say to itself: "I know what that gesture is. I've seen it a thousand times. That means he's depressed." It's like the convention of having wavy lines on the screen to indicate the start of a dream sequence. There's nothing inherent in that sudden sort of water image that means "dream", except that the audience has been conditioned to interpret it that way. Internal states are awfully hard to portray visually, whereas, in books, they're very easy. All it takes is a line of dialogue: "I came home and I was very depressed." That's it. You've done it—and you don't have to justify it, somehow.

**QUESTION:** Do you think that there are some things that are easier to portray on the screen than in a book?

**CRICHTON:** Yes. At the other extreme, any kind of description in writing is lengthy, whereas, on film, it's instantaneous. Exactly the reverse situation applies. You can spend a page describing how somebody looks, the way he acts, the way his surroundings are, what kind of house he lives in. In film, all of that is immediate. You show it—and that's it. Certain traditions have sprung up to try

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to get around limitations of the medium and one of them is what I call the "verbal flashback", in which a character who finds a moment of repose tells an anecdote or incident out of his life which reveals his character. It's the kind of thing that almost never happens in real life, but it's been a sort of movie trick to define character for a very long time. One of the things we tried to do in "WESTWORLD" was to let the audience find out about a character through what he does, instead of having him sit back and tell a little story about himself or his past. I think of this as using the unique qualities of the medium.

**QUESTION:** In translating "WESTWORLD" from the script onto the screen, you adopted a certain visual style, in terms of photography and action. Can you tell me something about that style and why you chose it?

**CRICHTON:** The style, I think, is very straightforward—very conventional and very traditional. In many ways, it's the way the film would have been shot, sequence-by-sequence, had the sequences appeared in a 40's Western or a 40's version of Robin Hood. We had very little hand-held work—almost none. We had, to the extent that it was possible, unobtrusive camera moves. It was designed to be a picture that didn't shriek: "Director of Photography"—but, rather, it kept those qualities in the background and tried to push the story up front. We had two specific reasons for doing the story in that way. One was that, because we were trying to suggest that the

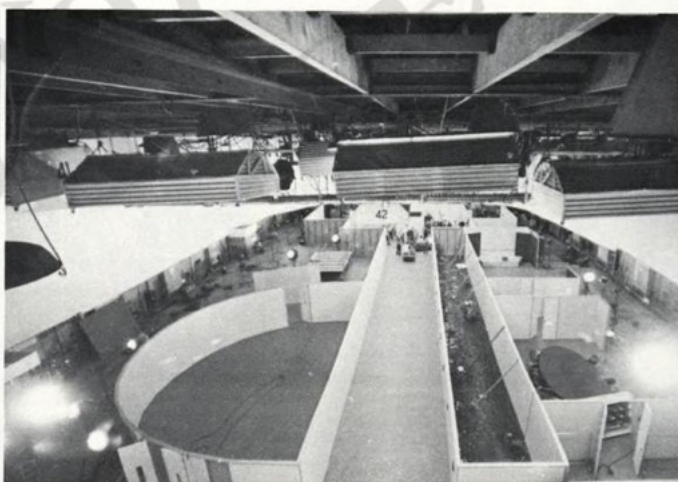
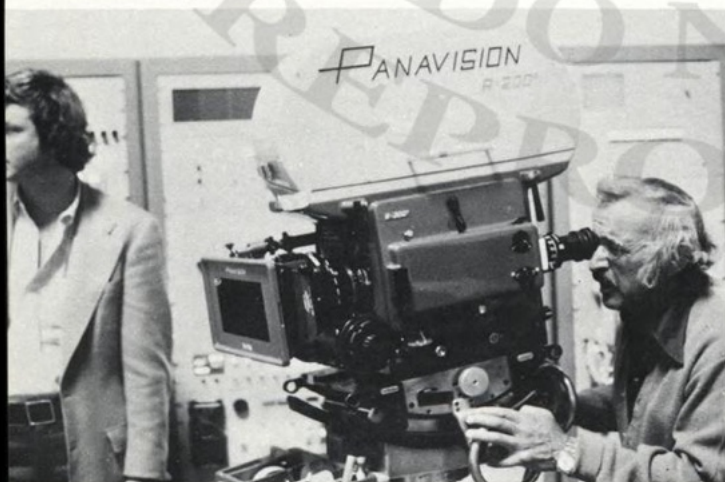
characters were trying to live out old movie fantasies, we attempted to shoot those fantasies as they used to be shot, at one time, even though those conventions are not used so often any more. For example, there was one instance in which we broke away from our desire for unobtrusive camerawork, just for this reason. That was in our exterior Western street sequences. Everything was a crane shot because, as far as I can tell, all the old Western movies had crane shots. The camera went up or down every time the good guys rode into town or the bad guys rode out of town. There was always a vertical camera move, for reasons which I never really understood—but we did it, too. The other reason for shooting in that sort of conservative way is that the story itself is very strange and, in such a case, I think that there is always an enormous temptation to shoot it strangely, to have bizarre combinations in very odd framings and to cut people's faces in half in order to use extreme closeups. My feeling was that the strangeness of the story would, in fact, be emphasized by conventional shooting, rather than by a photographic style which kept saying to the viewer: "Isn't this odd? Isn't this odd? Look how odd it is. We're even going to shoot it odd."

**QUESTION:** In regard to Gene Polito, your Director of Photography on "WESTWORLD", can you tell me something about your method of working together, the rapport established between you, and his ability to translate into visual terms what you had in mind?

**CRICHTON:** I'd known about Gene's

abilities because of the work he'd done with Michael Ritchie, whom I admire, and I felt that he would be able to handle the very special problems we would encounter on this film. We wanted the picture to have a kind of "classic" look to it—but we were given a very, very short shooting schedule and we had an enormous range of technical problems. The picture would have been miserably difficult to do even with a long schedule, but we had a 30-day schedule and getting it all on film the right way seemed close to impossible. Gene is terrifically well-organized and tremendously competent in technical areas, which, for this picture, was enormously important. We had a wide range of special effect situations and technically challenging problems—which certainly frightened me because of what I didn't know about such things. We were shooting rear-screen and front-projection and blue screen and color video re-photography, and we were shooting certain of the actors wearing mirrored contact lenses. We filmed a lot of the picture at very low light levels and we were moving incredibly fast, so that we were forced into multiple-camera situations more than any of us would have liked—especially with Panavision, because it gets hard to squeeze those cameras around when the picture is so wide. Gene is just terrific for all of that. We moved so fast that nobody could believe it, and we couldn't believe it ourselves while we were doing it. We made 52 set-ups one day and 47 the next day, while we were at Warner Bros. shooting exteriors on the Western street—and we'd sit around at the end of the day and marvel at how we'd gotten through it.

(LEFT) Gene Polito sets a composition with the Panavision R-200 camera. (RIGHT) A huge set, representing a NASA-type complex housing the control center and "robot repair" was constructed on MGM's Stage 25, which measures approximately 117 feet by 195 feet, with a 360-degree cyclorama backdrop 40 feet high. Overhead can be seen the "chicken coops", large soft-light units, each of which contains ten 1000-watt silver-bowled globes. These units provided a general light of 125 foot-candles over the entire set, making possible 360-degree pan shots and countless camera set-ups per day.







(LEFT) Crichton checks a set-up through the viewfinder of Panavision-modified Arriflex camera in special Panavision blimp. (RIGHT) Lining up for a high-angle shot. Despite the fact that the subject matter of the film is very bizarre, Crichton resisted the temptation to implement a bizarre photographic style, opting, instead, for a straightforward "very conventional and very traditional" style. It was his feeling that the strangeness of the story would, in fact, actually be emphasized by conventional shooting.

**QUESTION:** You mentioned the use of multiple cameras. Would you like to elaborate a bit more on how and why you used them?

**CRICHTON:** It was strictly in the interest of efficiency and being able to save a lot of time, with no sacrifice to the kind of picture I was after. We had a lot of complicated action and there were a lot of things we couldn't afford to do twice. If there was a large piece of breakaway glass or a specially equipped suit that was destroyed, we used multiple cameras because we couldn't repeat it. We didn't have the budget for another piece of glass or whatever. The production people were very much opposed to our use of multiple cameras, arguing that it would be cheaper to stage the stunt again, but I think we demonstrated convincingly that this was not true. There were several situations where we were using normal speed and high speed in the same set, and Gene suggested that if he put the ultra-high-speed Panavision lens on the Mark II camera, he would not have to relight. The only question was whether I could live with the 55mm lens—which I was very happy to do. It kept the actors a bit cooler, also. A lot of the time we were shooting at 5 foot-candles. By the time we hit 12 or 15, everybody began to relax and say: "This is no big problem." When it got up to 30, nobody had any sympathy for Gene at all. After all, it was 30 foot-candles. Anybody could shoot with that. He demonstrated early on that he was fine working at those levels, so that's what he did.

**QUESTION:** Even though you've spok-

en of a "straightforward" photographic style, it would seem to me that the very nature of the story would demand techniques that were somewhat less than conventional; isn't that so?

**CRICHTON:** Actually, yes. For example, Gene shot many of the exteriors without the 85 filter, and we tried a lot of other things, little tricks and innovations that came to mind, but we ultimately abandoned most of them. Some of our sets were entirely white and Gene tried various combinations of underexposing and forcing development to see what would happen to the contrast. The MGM lab had been alerted to this, but the guys down there were terrified all the time. Also, we were doing a lot of sort of smart-guy, first-time-director stuff. For example, we had a couple of 360-degree and 720-degree shots and Gene, to my astonishment, never batted an eye. I really expected to hear him say something like: "You can't do that." or "It will take a day to light it."—but that never happened. I'd say: "Now, we're going to do a 360 here." and he'd say: "Yep. All right." There was no sort of reaction at all. It was a very strange experience.

**QUESTION:** What about the special footage that had to be shot for the video monitors and also to provide John Whitney, Jr. with what he would need to make the computerized robot point-of-view shots?

**CRICHTON:** Along with our regular production footage, we were shooting two other kinds of special footage. We were shooting flat film for transfer to video tape, so that we could later

re-photograph it off of video monitors. We were also shooting footage that was going to be processed by computer to represent the robot point-of-view. This was a kind of hazardous situation and we were a little bit concerned about it. The computer program that was going to generate the final footage had been worked out by the time we started shooting, but the tests were disturbing because of the variety of options they offered us. It wasn't clear exactly what the computer required, except that it wanted a lot of contrast. We shot it that way and later discovered that it was easy to increase contrast within the computer itself. We finally began to pull other footage that we hadn't expected to give the computer and fed it less contrasty stuff. Color contrasts were important. As a result, for our exterior sequences, a poor fellow who was to double for Dick Benjamin was done up entirely in red. His hands and his face and his clothing were all bright red, because, when he was standing against a blue sky, we didn't want to lose him. Then we had another sequence where Benjamin was in totally white makeup.

**QUESTION:** I'm sure you've been asked this question a million times, but I know that our readers will be interested to learn how and why, having gotten your degree as a medical doctor, you ended up writing and directing films. It seems like quite a switch.

**CRICHTON:** Well, it does seem strange, but I think it's what I always wanted to do. The only other doctor I know of who's done the same thing, Jonathon Miller, has said something which I think

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is true—namely, that being a doctor is good preparation for this, because it teaches you to deal with the kind of life that you will inevitably have. It teaches you to work well when you haven't had enough sleep. It teaches you to work well when you're on your feet a lot. It teaches you to work well with technical problems and it teaches you to make decisions and then live by them. I think it also has advantages in working with actors, because one of the things a doctor has to learn is to be able to meet a patient whom he has never seen before and rapidly assess him in terms of what kind of person he is, and not merely whether he's perforated his ulcer. You've got to be able to analyze just what kind of person you're dealing with. Are you dealing with someone who will take medicines if you prescribe them—or is he the kind of person who says he will, but won't? Those decisions get to be very important and training to be a doctor builds up that capability for assessing people rapidly which is necessary when it comes to working with actors. I'm not quite sure just how the transition from medicine to movies came about, except, as I've said, that I think I've always wanted to make movies. When I got into medicine I was disappointed in a lot of ways, so it was a pull from one direction and a push from the other.

**QUESTION:** As we all know, you went through an intermediate stage of being a novelist, but making a film is quite different from writing a novel. How were you able, in such a relatively short

time, to learn the methods and mechanics of something as enormously technical as film production?

**CRICHTON:** I'd had one previous experience in film directing before "WESTWORLD" and that was the television movie, "PURSUIT", which I did for ABC. That was also a very difficult production situation—one of those situations where you were glad to have gotten it finished at all. The cameraman on the project was Bob Morrison, who really just took care of me. In fact, a lot of people took care of me, including the actors. I learned very fast because I had to learn fast. There were thousands of things to learn, all kinds of details which I'd had no idea about. But I just did it because I had to. It was a very fast course.

**QUESTION:** Were you able to augment your technical knowledge by means of any extracurricular study—books on the subject, and so forth?

**CRICHTON:** For someone who was not brought up in film, it's very hard to get any kind of specific technical information about film-making—I mean, the sort of "case history" information that tells precisely how certain things were done. The two ways that I know of to learn such things are: (1) a sort of general explanation from someone who sits you down and says: "If you want to diffuse a lens, you can do this or that..." and (2) what I call the "case history", which is someone telling about what happened on a certain project—what problems there were and how they were dealt with in a specific way. The stuff that's in print in books is pretty

awful. At least, that's been my experience and I gather it was Mike Nichols', as well, when he did "VIRGINIA WOOLF" as his first picture. The books just don't tell you very much, except for things like: if you choose a low angle it's more dramatic. That's not terribly valuable. But for the "case history" sort of thing, I found that the American Cinematographer is terrific. It was a kind of gold mine for me because it's full of articles telling in precise detail how, on specific projects, certain techniques were used and problems solved. It was difficult for me at first, because I didn't have the background to understand it, but then, after I'd become more comfortable with the medium, it was really terrifically valuable.

**QUESTION:** I understand that you spent quite a bit of time on the set of "THE ANDROMEDA STRAIN" when it was being filmed. Did you find that experience helpful to you later when you started directing?

**CRICHTON:** Bob Wise was really very nice about letting people watch and learn from what he was doing. I was just the writer of the book hanging around the set—which was a totally non-existent function. But he had, as I recall, an AFI intern and a Director's Guild trainee on the project, mostly just watching. I had never seen any kind of a film made before, except during brief visits to stages for a few minutes. Bob was the first director I'd ever had a chance to observe at work and, in an awful lot of ways, he's the model I've retained. Bob dealt with all of the problems very smoothly. His particular style of directing is very relaxed, very easygoing, very personal and very well-organized, but without a lot of histrionics and temper flares. That impressed me a lot and I've tried very hard to be that way, too.

**QUESTION:** Without getting into one of those ivory-tower, esoteric discussions, may I ask what you would like to accomplish with film. In other words, what is your objective in making pictures?

**CRICHTON:** The first thing I'd like to say about film is that, because it's so expensive, it has to be supported by a very large audience. That's a really significant difference between a film and, let's say, a book. A publisher can sell 4,000 copies of a book and still come out all right financially, but a film that is seen by only 4,000 people is a disaster of almost unheard-of proportions. A much larger audience is necessary to make film-making commerci-

(LEFT) Richard Benjamin is dressed in white wardrobe, with a white makeup and white hair spray for shooting of high-contrast scene to be electronically processed for robot POV shot. (RIGHT) A Ferco monorail is pressed into service for simulated dolly shot over rugged terrain.





ally viable. I'm not talking about an enormous commercial success, but rather a sort of break-even situation that will allow you to continue to engage in the activity. Therefore, the potential audience exerts an unmistakable pressure on what you do and how you do it. With "WESTWORLD", I chose to do what I regarded as a blatantly commercial film, and I don't think there's any harm in that. I believe it's possible to make less commercial films—films that are more idiosyncratic in terms of what the film-maker wants to say—without nullifying the possibility of the film's breaking even or becoming moderately successful. Television is really the mass audience medium, whereas, feature films are inching more toward specialized audiences. My approach to licking the problem is that I try to do things that can be taken in different ways. If you want to look at "WESTWORLD" as a kind of science-fiction shoot-'em-up, that's fine. If you want to look at it as a sort of bemused allegory, you can do that, too. One interpretation does not make the other impossible. In that sense, my model is something like "LORD OF THE FLIES", which is a very good story on one level and a very profound story on the other. But it doesn't insist that you recognize it as profound. That's the sort of thing I want to do.

**QUESTION:** Do you have any film plans for the future that you'd care to talk about?

**CRICHTON:** Well, I'm having trouble going back to writing now. It's hard to sit there alone. I've been trying for about a month now and I'm only just beginning to enjoy the fact that people aren't walking into my office and saying: "Would you please make a decision about the color of the floors?" There's a lot of excitement in making movies. I think I've learned two things from the experience. One thing is that the people who gripe about the whole movie-making situation and claim that there isn't enough money, and so on, are the people who sabotage projects. It's really a phony thing, and they ought not to be allowed to get away with it. I think it's necessary to be able to work within your strictures, even when those strictures are so impossible that you're ranting and raving and screaming about the studio executives, like everybody else. Once you settle down, those strictures provide a certain sort of creative impetus and the result is something better than if you'd been given all the money and all the time you wanted and that guy in the front office had said

"yes" every time. That kind of discipline produces a tighter, more inventive kind of film. The other thing I've found is that it's really fun to make movies. It's so much fun! It's really awful to be paid for doing it. I really miss that excitement now that I'm writing again. I don't find the writing so much fun anymore.

**QUESTION:** If you had "WESTWORLD" to do over again, is there anything you would do differently?

**CRICHTON:** I really feel that this experience has convinced me more than ever that pre-production is the key to it all—especially with a tight shooting schedule. We had no rehearsal time—which is bad—and we could have used more test time. All of that I log under pre-production, and I will never do another picture without adequate preparation in that area. To the extent that studio executives do not understand this fact, they're just fools. Pre-production saves them money. It may cost them \$2,000 a day, but it will save time on the set that often runs to more than \$2,000 an hour. ■

### "WESTWORLD": A STATE OF MIND? By GENE POLITO

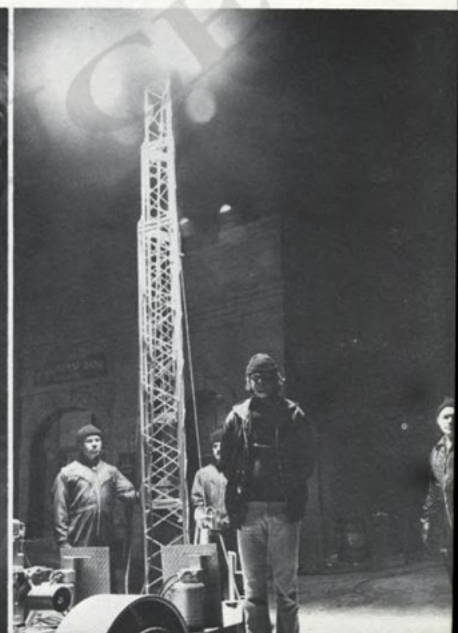
Director of Photography

You will find a small sign posted above the starter's window at Los Robles golf course which reads: "Good golf is a state of mind—Arnold Palmer." As a confessed "golf nut", I have reached the conclusion that Palmer's observation could apply equally to professional cinematographers. As a matter

of fact, Directors of Photography have a lot in common with today's touring pros: the field is overcrowded, the competition is keen, the pressure is ever-present, the financial stakes are high, and the odds of coming up with a winner—consistently—are staggering. And—oh yes!—When the chips are down nobody is going to make that tough shot for you! Herein lies the daily challenge which faces touring pros and D.P.'s alike. In retrospect I have come to realize that good photography—like good golf—is truly a state of mind.

The reader might well ask, "What constitutes an ideal state of mind for the Director of Photography?" Perhaps a glimpse of "WESTWORLD" through the eyes of a cameraman will provide the answer. To begin with, "the chemistry was good" between the director, Michael Crichton, and myself. It is this particular ingredient that is most essential in the initial stages of achieving "a good state of mind" for the Director of Photography. Very often the initial stage involves an interview between the director and the cameraman, who are total strangers to one another, on a personal basis. This can be a devastating experience for the new Director of Photography who is short of material (credits) to talk about. (Most cameramen—including myself—have been down this road before. There is no shortcut, other than a smash-hit on your first trip to the plate—and the odds against doing this are pretty high.) Michael Crichton and I were total strangers when we first met. But neither of us lacked material by way of our respective backgrounds to provide the basis for a lively and interesting interview. The "chemistry was good" and Michael hired me to do

(LEFT) Crichton and Polito excitedly discuss a camera angle. "The chemistry was good" between them, which resulted in an excellent working rapport. (RIGHT) To achieve an eerie type of light for night shooting, mercury vapor lamps, high in the green spectrum, were utilized. They are normally used for repairing freeways at night.





"WESTWORLD". Thus, the first crucial element necessary to achieve a "good state of mind" was behind me. Moreover, I could hardly wait to get into the script once Michael gave me a clue as to what "WESTWORLD" was all about.

After reading the script for "WESTWORLD", my first reaction was that I had stumbled onto a gold mine—in the sense that it promised to be a rich experience for a cameraman. As it turns out, "WESTWORLD" is the type of story cameramen dream about, but rarely—if ever—run into. "WESTWORLD" offered four distinctly different visual backgrounds within the time frame of a single story. I thought to myself, "Imagine... an action 'western', decadent Rome, the Medieval era, and a NASA-type space-age complex... all in one film!" But that is what "WESTWORLD" offered me: four "photographic worlds" to work in.

#### PHOTOGRAPHIC HIGHLIGHTS

"WESTWORLD" opens with a prologue (ahead of the credits) which has a rather unique format in itself. We wanted this portion of the picture to hit the screen in an aspect ratio similar to the old Movietone News ratio (about 3 to 4). Since the picture was shot entirely anamorphic Panavision, I had Panavision

inscribe special lines on the ground glass in order to shoot the prologue with an anamorphic lens, and yet allow us to compose for the Movietone format. In the release prints the unused portion of the anamorphic screen was simply blacked out in printing.

Following the screen credits, "WESTWORLD" opens with a rather bizarre shot designed to "set up the audience" for the hovercraft sequence. In this instance, the hovercraft is an airborne vehicle (for the purposes of the story) that transports people to and from "WESTWORLD"; it scoots very low off the ground at speeds of about 300 mph. The sequence opens on a close shot of one of the lenses on the pilot's colored glasses. At this point the audience has no way of knowing what they are looking at, other than the ground whizzing by at tremendous speeds. We hold on this for a beat and then zoom back to a full shot of the pilot's face where we see what he sees—namely, the desert whizzing underneath him. To accomplish this shot, we used front projection onto the pilot's glasses by cementing front projection screen material to the actual wearing glasses themselves. The only difficulty here lies in the balance; it's tricky, because the front projection image on the glasses becomes "very hot,

very quick" and the balance between what you see visually projected on the lenses of the glasses, as opposed to the overall key light falling onto the pilot's face, becomes deceiving. There is no formula for this and I must confess that the results were based on an educated "guess" exposure-wise. It turned out great!

One of the main characters of "WESTWORLD" happens to be a gunslinger who, in turn, happens to be a robot. The part is played excellently by Yul Brynner. Michael Crichton wanted the gunslinger's eyes "to look like electronic eyes" at a certain point in the film. Michael and I discussed various possibilities to achieve this effect. Tests were made using a variety of contact lenses which were silver-coated to produce varying amounts of reflectivity: 50% transmission, 50% reflectance; 80% transmission, 20% reflectance; 20% transmission, 80% reflectance, and so on. At first I was certain that by using a front projection configuration I could achieve the best results simply by shooting through a 50-50 mirror and projecting a light beam directly into Yul Brynner's eyes on the same optical axis as the camera (using the mirror). I was wrong; it does not work that way. Then

Continued on Page 1474

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## FILMING "WESTWORLD"

Continued from Page 1438

we tried various ways to light the eyes by resorting to some of the techniques used in commercials vis-a-vis a huge white surface with a small hole cut out for the camera lens. This proved to be too time-consuming and was discarded in favor of conventional lighting. Which brings up this point: when the chips are down, and the time is fast running out, some of the best answers to the worst problems seem to emerge almost by sheer magic. I am sure there are those who will agree that some of the best work done in motion pictures is done under the pressure of time... and lack of funds. At any rate, we found that contact lenses with 20% transmission and 80% reflectance served our purpose the best without resorting to "exotic lighting techniques".

More about the gunslinger (Yul Brynner): There is a point in the story where the gunslinger (a robot, remember) is sent in for "repair". The trick here was to put the "real" Yul Brynner on an operating table for "inspection of malfunctioning circuitry". Then, by camera magic, we show the gunslinger's face being lifted off, revealing all of the electronic circuit boards in his skull. During the pre-production stages of "WESTWORLD" a make-up man was flown to Paris to meet Yul Brynner for the purpose of casting his face. Therefore, when we got to this sequence, a plaster replica of Yul's face had been prepared in such a manner as to allow the facial portion to be removed to reveal all the "electronic guts" which were supposed to make him function as a robot. Needless to say, plaster and human skin do not have anywhere near the same characteristics. In order to "match" the "live" Yul Brynner to his plaster reproduction, I worked for almost two hours (on production time!) with the aid of two make-up men and a Polaroid camera until the Polaroid stills of the plaster replica matched closely enough to the "real" Yul Brynner in texture and color. The results were so close that it even gave the guys in the lab a "shock" when his face was removed! (The audience responded right on cue, too.)

The gunslinger was "repaired" in "Robot Repair"—a NASA-type complex complete with all sorts of exotic equipment, including a laser machine. This set was enormous and occupied the entire Stage 25 at MGM studios in Culver City; a stage measuring approximately 117 feet by 195 feet. It was encompassed for 360 degrees by a white cyclorama backdrop, 40 feet high, from the stage



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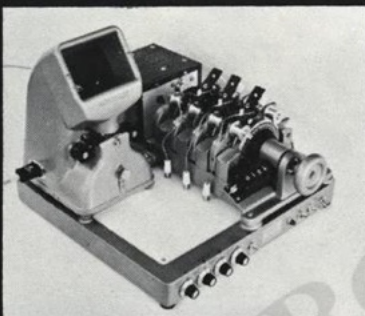
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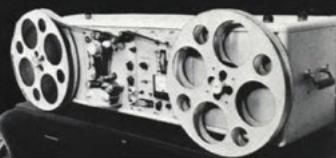
floor to the rafters. Some of the shots we had planned required the use of the Panavision wide-angle 30mm and 40mm lenses. This, in turn, meant that any thought of conventional lighting decks would be out of the question; the lights themselves would be in the picture, since we would be shooting to the very top of the cyclorama. Therefore, I decided to light this entire set with a soft-type of general overhead illumination. For this purpose we scrounged all over the MGM lot for all of the "chicken coops" we could find. Most of them had not been used for years. We gathered them all up and had them repainted, reswitched, and re-globed. Each "coop" contained ten 1000-watt silver-bowled globes; each coop was arranged to switch on 2, 4, and 4 globes (total 10,000 watts) to give us complete control. Naturally, on certain scenes, we used floor lighting equipment to supplement the general overhead lighting—where possible. The "chicken coop" arrangement produced about 125 foot-candles evenly distributed over the entire set. This entire lighting scheme not only provided a "natural look", but enabled us to make 360-degree pan shots and countless camera set-ups per day.

In the Control Room of "WEST-WORLD" we utilized a number of "live TV monitors". Original footage that we had shot was transferred to ½" tape for this purpose and the photography was done with Panavision's special "old Bell & Howell threshing machine" which has been equipped with a shutter that eliminates "roll bars". Our shots were arranged in such a manner as to avoid any "looping" of dialogue due to the use of such a noisy camera; for dialogue scenes we simply switched to the Panavision PSR Reflex sound camera and avoided the TV monitors. Since I had photographed a picture called "COLOSSUS" for Universal using 17 "live TV monitors" (in color), the problem of setting up the color bars and selecting the proper exposure was really drawn from that prior experience; I did it as before—namely, exposed for 75 foot-candles at a stop of T/3.2, forcing the development one full stop.

The remaining interior sets on this production posed no particular problems in terms of lighting, with the exception of one set in the castle. Here I had to use three Titan arc lamps because of the tremendous throw involved. On most of my sets, my fill light consisted of "bounce light". The method employed here is quite simple and very effective. I used styrofoam boards (pure white) about one-inch thick. The size of these styrofoam boards varied depending

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on the usage. For example, I had some boards that measured 48" x 48" and others that were 8 feet x 8 feet. These styrofoam sheets can be obtained in 4-x-8 feet sizes. Since they are feather-weight, it is an easy material to use for bounce light. I found that PAR-64 "six-lites" were the most practical light to use for this purpose and they provide maximum control through individual switches in increments of 1000-watts.

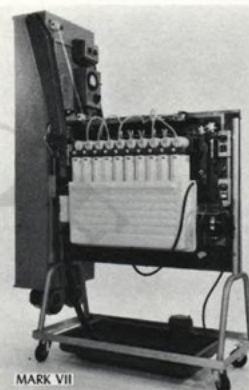
A word about the "Whitney footage". Some of the scenes in "WEST-WORLD" required the gunslinger's P.O.V., as seen through his "electronic eyes". A chap by the name of John Whitney, Jr. has devised an ingenious method of taking original camera footage and converting the image into a fascinating mosaic pattern of varying shapes and colors. The trick here is to provide original camera footage which contains sufficient "contrast" to produce a good computer facsimile. We made tests of certain key sequences to arrive at a contrast that would be suitable. For example, we had Richard Benjamin made up completely in white: white make-up, a white western wardrobe, complete with white gloves, and white hair spray. He looked as though he had fallen into a barrel of flour! But that is the kind of contrast that seemed to work best for us on this particular sequence. Other shots (exteriors) were put through the computer to achieve a similar effect. The visual effect really "set up the audience" for a believable robot gunslinger P.O.V.

On some of my exterior shots I deliberately left the 85 filter off the camera. This is interesting; for years I have heard that you should never shoot "day exterior" without the 85 filter. Well, on "WESTWORLD"—through sheer necessity—I learned something; you can do it—and successfully. The problem was as follows: We had shot a major sequence (the "shoot-out" reminiscent of "High Noon") on an overcast day. The sequence could not be completed on that particular day. The following day turned out to be beautiful—a bright sunny day. How do we "match" the missing cuts? I talked the situation over with Michael Critchton and explained that I had learned from Stanley Kubrick that he had shot "A CLOCKWORK ORANGE" entirely without the 85 filter. Moreover, I explained to Michael that if we could shoot our missing cuts after the sun went down—in the flat, shadowless type of light one gets at twilight—we could "match" our overcast day's footage. To do this meant shooting a little footage each day over a period of a couple of days since the "magic hour" does not

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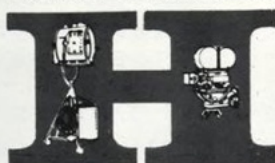
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last long. However, we were able to "extend the magic hour" by eliminating the 85 filter; we picked up additional exposure in doing so. The MGM lab even gave us "color-corrected dailies" on the scenes that were shot without the 85 filter and I doubt that even the trained camera eye could detect the difference between those scenes shot "with" the 85 filter and those shot "without the 85". Interesting? I thought so at the time and I have since employed this technique on other assignments where daylight scenes normally would be out of the question.

A word about the production staff on "WESTWORLD". The rapport between a cameraman and the production staff is no small matter when it comes to creating a "good state of mind". I cannot remember any prior assignment where there was a better rapport between the production staff and myself. The assistant director and unit manager were one and the same person: Claude Binyon, Jr. Although we had never worked together before, it became apparent that Claude was a very knowledgeable person in many areas—particularly, in relating to the needs of the cameraman. He was instrumental in setting up a line of communication—on a day-to-day basis—between the director, the cameraman, and the production staff that I have never experienced before. We all worked as a team which, in turn, created a wonderful feeling that eventually rubbed off on everybody. Part of this was due in no small measure to Michael Crichton himself, who seemed to bring out the best in everybody from the floor-sweeper on up! He is the type of director who gets the creative juices flowing. In my case, all of these factors contributed to a "good state of mind".

Aside from being a beautiful example of teamwork at all levels, "WESTWORLD"—considering its scope—was brought in at the modest cost of \$1.25 million in 32 shooting days. A great deal of credit should go to the Production Designer, Herman Blumenthal for his ingenuity in constructing some enormously gorgeous sets on a shoe-string budget. We had fun making this picture and everybody connected with it felt that it showed up on the screen. Could it be that "WESTWORLD" is a state of mind for the beholder? ■

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WORLD", he had a problem: to find a technique to represent, on film, the point of view of a machine. The script called for the audience to see the world as a robot gunfighter, played by Yul Brynner, saw it. This "robot POV" was supposed to consist of a series of animated colored rectangles. It could not be done by any known special effects technique. Something new was required.

It occurred to me that the scanning-digitizing methods employed by Jet Propulsion Laboratory on their Mariner Mars flybys could be used here. Basically, in this system, an image is broken down into a series of points, and the gray-scale value for each point determined. A numerical value can then be assigned to each point, and a new image reconstituted electronically. Similar techniques have been devised in computer science to enable computers to "read" handwriting, X-rays, seismic data, and so on. It is the kind of technology that allows a computer to tell the difference between a "P" and an "R".

Once the computer has "read" the image and converted it to a series of numbers, there is tremendous flexibility in what the computer can then do with this numerical information. The image can be reconstituted with different contrasts, different resolutions, different colors. We can enlarge, stretch, squeeze, twist, rotate it, position it in space in any way. In fact, the only limitations are imposed by the creative talents of the person operating the machine.

That is, if such a machine is available at all. This was my first problem: tracking down scanning and playback hardware. At first it appeared that I would have to do all the scanning on a machine in Houston, and all the playback at the Jet Propulsion Laboratory in Pasadena. That was an inconvenient solution, and also expensive: JPL estimated that machine time for playback would cost \$100,000—for two and a half minutes of motion picture film!

In any case, that was five times my total budget, so another approach was required. Quite by chance, while doing some other work at Information International, Inc., in Los Angeles, I discovered that they had developed, over the last four years, a prototype image-processing system suitable for my needs. Critical was the fact that their hardware could handle sprocketed 35mm film with the necessary registration.

That was a lucky break. After making financial arrangements with the Information International management, I began work on the programs with Russ Ham and Dean Anschutz of that company. To their credit, they

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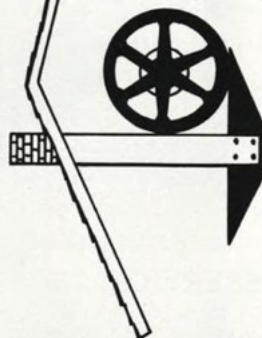
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rapidly wrote excellent and flexible programs.

These programs instructed the computer to scan production footage, frame by frame, and convert it to numerical information. The computer then clumped the information to produce a new image composed of an array of squares. (Actually, the computer constructed an image of rectangles, but because the production footage was shot in Panavision, when unsqueezed, it would appear as squares.)

I then entered a crucial phase of testing. Although we knew, in principle, that the system would work, there were major questions about how best to achieve the desired effect. An early consideration was how large to make our rectangles—in other words, the resolution of the image. We wanted coarse resolution, but obviously the perceived resolution in a theater depends on the size of the projected image and the viewer's distance from the screen. I made several projection tests in different-sized theaters, and from this determined the best resolution for our purposes. That turned out to be an image composed of 3600 rectangles.

Our next problem was shooting criteria: we had to decide what qualities of production footage were important for a good computerized image. (Since all the computer work would be done in post-production, this was very important.) We found the system worked best for medium and close shots; that it worked best for lateral action; that it worked best for shots with good contrast and color separation.

These considerations led us to make up special costumes for our principals—all-white costumes for dark backgrounds; black costumes for light backgrounds; and red costumes for exterior shots. Production footage intended for the computer would be shot with actors wearing these costumes.

This testing phase ran for two months, and then the first scenes began to arrive from the film. As they came in, I had the MGM optical department make black and white color separations from the camera negative. Each separation was individually scanned, data-processed, and stored on tape. The next stage was tape playback on a high-resolution oscilloscope, and the resulting image rephotographed. This process was done frame-by-frame, for each color separation, for each scene.

It was a slow business, requiring about one minute per frame, or about eight hours for a ten-second sequence. But it was also exciting to be there, especially during the scanning. You would be sitting in this big room with

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the lights off and all this equipment around you, and there would be several monitors—graphics display terminals—all showing the newly digitized image at the same time so wherever you looked you would see the image. It was quite amazing, going from the analog world of 35mm to this digital, electronic world.

We had our usual share of foul-ups and mishaps. Contrast control was very delicate, because it had two phases—contrast was partially determined in scanning, and partially in rephotography of the digitized image. Because we were working with color separations, a shift in contrast altered our final colors. This made it very tricky.

Once I had the rephotographed color separations, I took them to my own optical printer to recombine them. Here I had more testing, and further discussions with the director on how they should be recombined. After a great deal of testing with different filters, and printing the records different colors, we settled on an approach that would give the most natural colors.

Even so, I was making adjustments in each sequence, right up to the time of negative cutting. There are fourteen computer sequences in the final film, and each was really treated individually. On some, contrast had to be changed; on some, we zoomed electronically; on some, we increased resolution; and on four sequences we printed only the red record.

Toward the end, we were operating under terrible time pressures, and from my standpoint some of that is reflected in the color quality of the final prints. However, audiences seem to respond enthusiastically and well.

As time goes on, and the computer systems which do this work become faster and cheaper and smaller, it should be possible to think of an "electronic optical printer" with broad applications in feature films, commercials—in fact, any visual area. Actually, my work on "WESTWORLD" suggested many more possibilities than we were able to explore, and there are certainly many others yet to be imagined.

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