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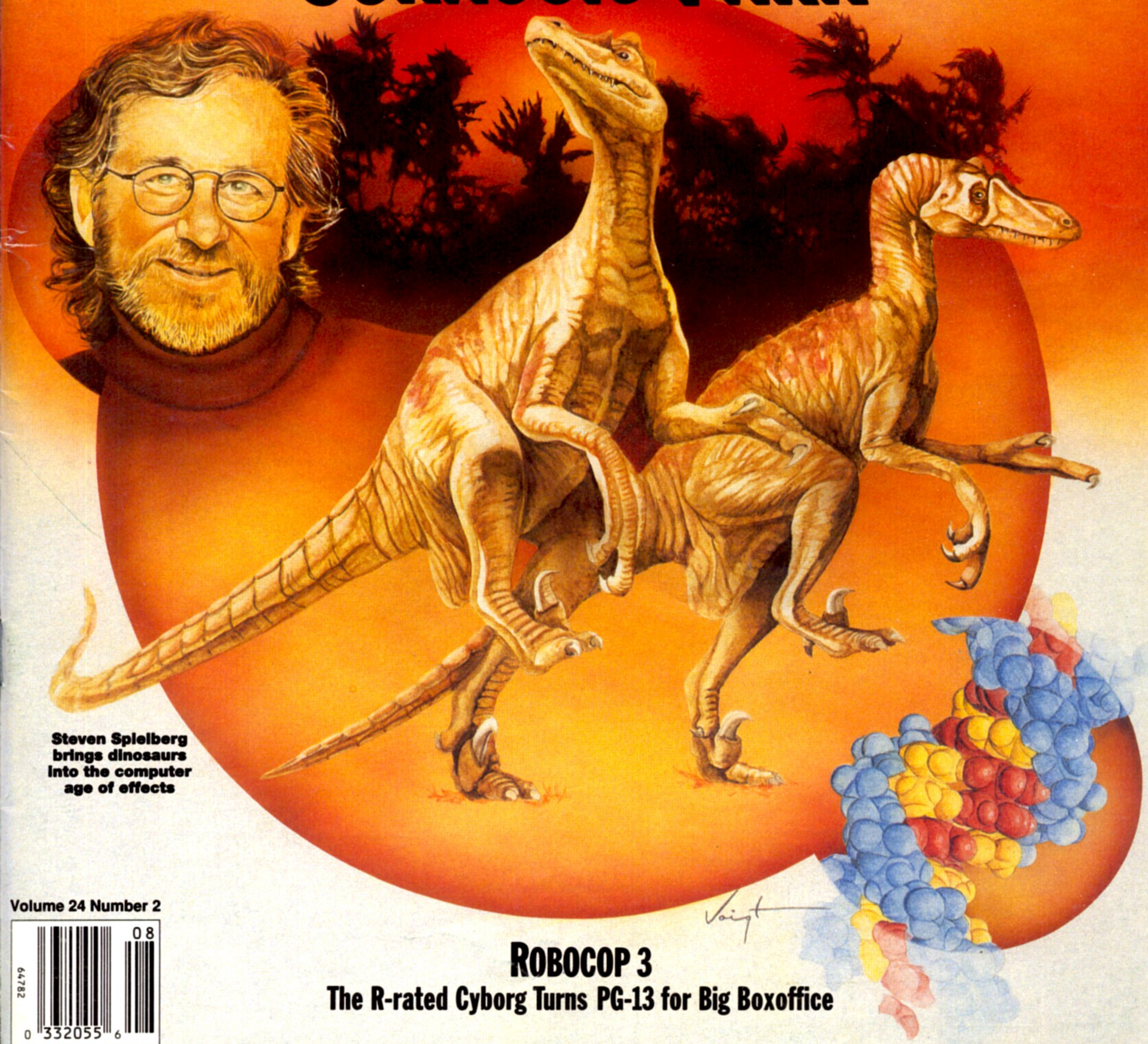
JURASSIC PARK



Steven Spielberg brings dinosaurs into the computer age of effects

Volume 24 Number 2

ROBOCOP 3

The R-rated Cyborg Turns PG-13 for Big Boxoffice

JURASSIC PARK

Steven Spielberg's creature feature looms as an effects technology groundbreaker.

By Alan Jones

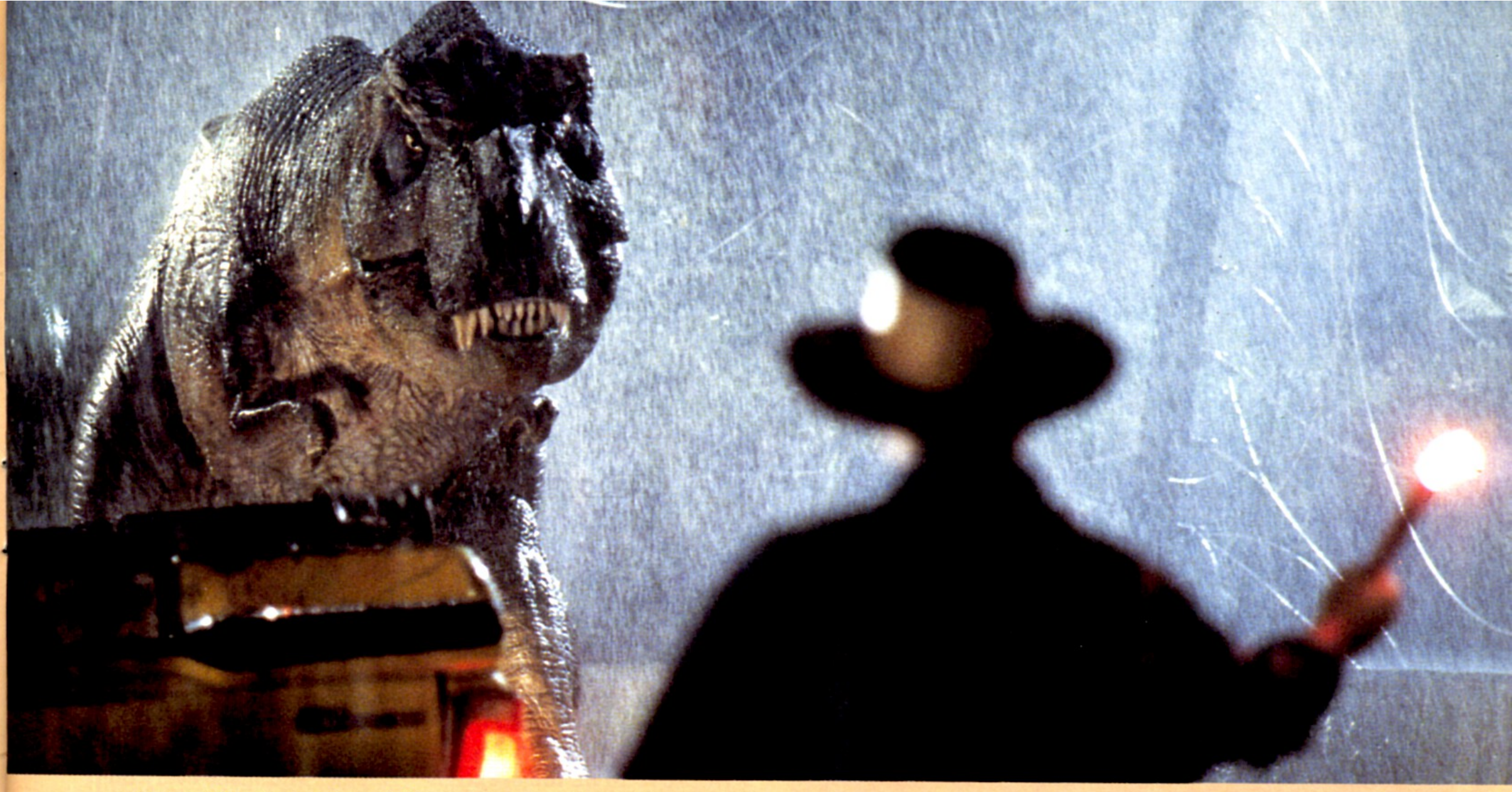
Will JURASSIC be a classic? Or will the PARK bark? That's the $60 million question regarding this summer's highest profile fantasy adventure release—Steven Spielberg's JURASSIC PARK. Audiences will find out June11. The $60 million budget estimate doesn't include the director's reportedly huge fee/back-end deal which could push the final tally well over the $90 million mark. Coincidentally, that was the figure first budgeted for the mega-project when Universal was considering building an actual theme park up-front as a production facility. The original idea was to open the custom-made location for leisure business concurrent with the movie's theatrical debut.

Based on the best-selling novel by former Harvard doctor Michael Crichton, JURASSIC PARK tells of one man's dream to create a unique game preserve on a remote jungle island near Costa Rica. Billionaire John Hammond has amassed a core group of experts who've discovered how to genetically engineer live dinosaurs from their fossilized DNA remains (found in the blood stream of prehistoric mosquitoes encased in amber) and has populated his scientific Disney World with long extinct breeds of the dangerous carnivores. Invited by Hammond to be the first to explore the wonders of his totally fabricated Lost World are paleontologist Dr. Alan Grant, his paleobotanist assistant Ellie Sattler and mathematician Ian Malcolm. The group find themselves fighting for their lives when vital security mechanisms malfunction allowing the manufactured creatures to run wild. Worse, the vicious breed of dinosaur—the bird-like Velociraptors—have been secretly reproducing at an alarming, unmonitored rate and are threatening to migrate from the island. And there's also an industrial espionage saboteur from a rival "consumer biologicals" corporation to contend with in Spielberg's epic creature feature.

The park's rampaging Tyrannosaurus Rex, closing in on a disabled park vehicle, one of the full-sized mechanical dinosaurs created by Stan Winston's creature effects group.

When Crichton's book was first published in 1991, many reviewers remarked how it resembled a screenplay treatment thinly masquerading as a novel. Hardly an earth-shattering observation considering Crichton is a well-respected director in his own right. While his novel *The Andromeda Strain* (1970) was brought to the screen by director Robert Wise, and *The Terminal Man* (1974) by Mike Hodges, Crichton directed his own scripts for THE GREAT TRAIN ROBBERY (1979), LOOKER (1981) and RUNAWAY (1984) after adapting and helming Robin Cook's medical thriller COMA (1977). Aside from his 1979 Victorian heist melodrama, all of Crichton's collective works, either on page or soundstage, have been preoccupied with the same central theme: sometimes cutting edge technology cannot be trusted. JURASSIC PARK continues this personal dissertation by highlighting the unpredictable aspects of biotechnology which Crichton maintains must be researched more fully before it's allowed to completely revolutionize mankind.

But the JURASSIC PARK concept is hardly new in the Crichton canon. It's basically a WHEN DINOSAURS RULED THE EARTH reworking of WESTWORLD, Crichton's own 1973 theatrical motion picture directing debut. (Crichton had directed the telefilm PURSUIT, based on his James Bond-style thriller, *Binary*, the year before.) WESTWORLD's premise featured a futuristic vacation resort called Delos, menaced by a short-circuit robot gunfighter in a Wild West fantasy world. (Minus Crichton, a less successful sequel, FUTUREWORLD, followed in 1976, as did a doomed teleseries, BEYOND WESTWORLD in 1980). JURASSIC PARK is the same plot magnified, finessed, and, with reference to the humid jungle setting, includes added dashes of *Congo*, another exotic Crichton novel. *Congo* featured a research expedition, aided by an almost human chimpanzee, discovering a race of intelligent, if militant, gorillas in a ruined temple deep within the African interior. As a feature in develop-



Staving off Winston's full-sized T-Rex, anchored, on the set. Dinosaur action was achieved by matching CGI effects supervised by Dennis Muren at ILM.

ment, CONGO languished for years at various studios despite Crichton's efforts to get it off the ground. That dismal experience led Crichton to develop *Jurassic Park* as a novel, not a film.

Precisely because Crichton's *Jurassic Park* novel read like a script and was very visual in content (graphs, control boards, tabulations and mathematical equations are all illustrated), it quickly attracted movie studio attention. It was no surprise when Spielberg's Amblin Entertainment Company and Universal pacted together to bring the exciting story to the screen, paying $1.5 million for movie rights. Principal photography began on August 24, 1992, at Universal Studios and on location in Hawaii. Despite losing a few days, and $1 million, to Hurricane Iniki, which struck Hawaii last fall, Spielberg finished his work on the movie in December. He achieved this by editing the main footage during shooting. Such a schedule allowed Spielberg to start his next movie, SCHINDLER'S LIST, in February. Spielberg prepped JURASSIC PARK while finishing HOOK in much the same way. However, the intricacy of the Industrial Light and Magic computer graphic special effects would indicate this editing-on-the-hoof method was the only available —and most cost-effective—option if the movie was to meet its June release deadline.

The JURASSIC PARK screenplay was written by David Koepp from an adaptation by Crichton and Malia Scotch Marmo. Koepp, a 29-year-old Wisconsin native, studied screenwriting at UCLA and co-wrote both APARTMENT ZERO and DEATH BECOMES HER with Martin Donovan. Koepp has also scripted THE SHADOW for producer Martin Bregman, the next project for director Russell Mulcahy.

JURASSIC PARK is photographed by Dean Cundey, who lit the BACK TO THE FUTURE trilogy, THE THING, DEATH BECOMES HER and served in the same capacity on Spielberg's HOOK. The film stars Sam Neill (DEAD CALM, THE FINAL CONFLICT, MEMOIRS OF AN INVISIBLE MAN) as Grant, Laura Dern (WILD AT HEART, BLUE VELVET) as Ellie, Sir Richard Attenborough as Hammond, Samuel Jackson, Bob Peck, Joseph Mazzello, Ariana Richards, Martin Ferrero and Jeff Goldblum as Malcolm.

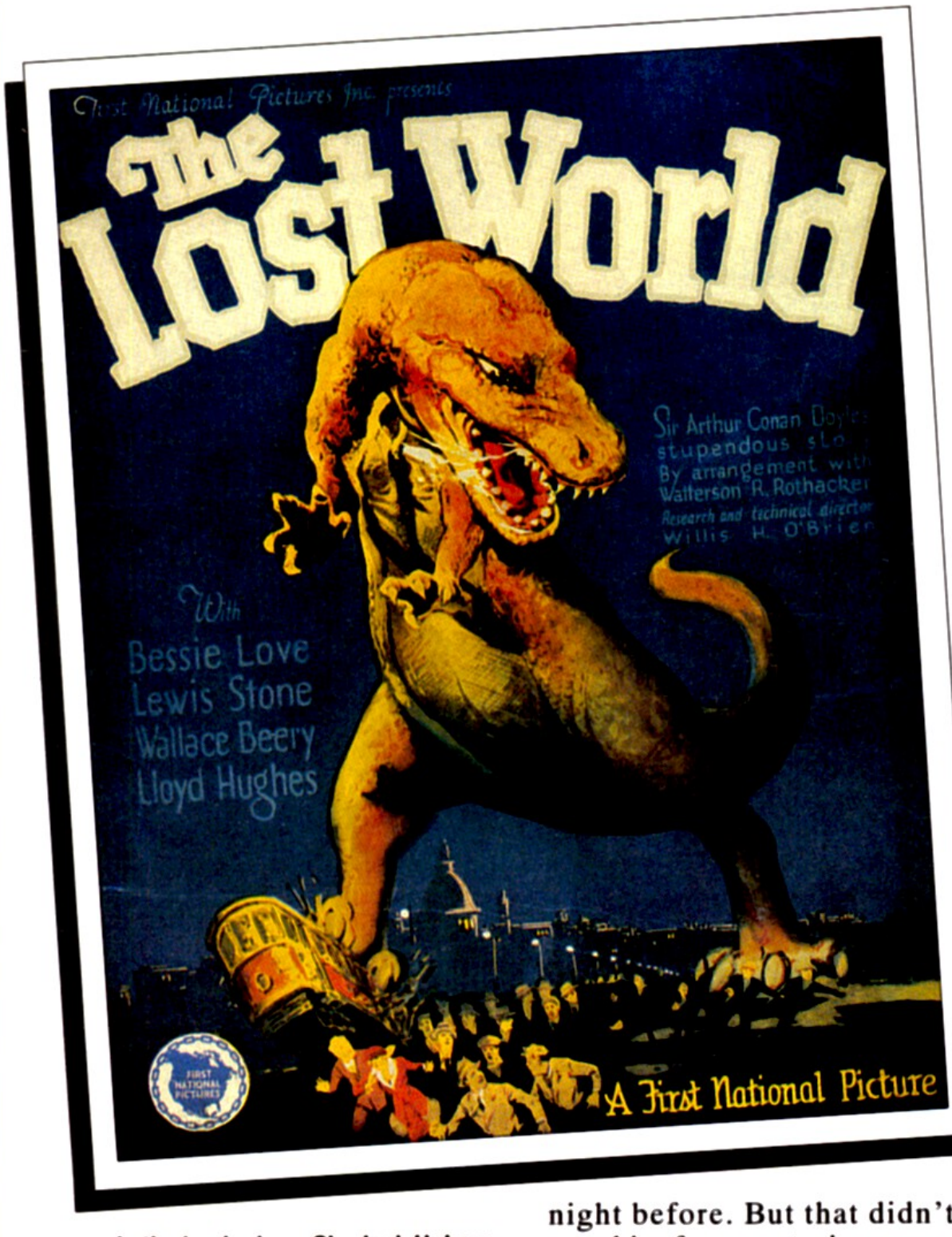
Neither Attenborough nor Goldblum was Spielberg's first acting choice. According to a production source, "He initially wanted Sean Connery and Kevin Costner who both turned him down." Ironically, Connery, Spielberg's INDIANA JONES AND THE LAST CRUSADE star, then went on to topline Phil Kaufmann's RISING SUN, based on another Crichton best-seller, one of JURASSIC PARK's summer rivals at the boxoffice.

From THE FLY and EARTH GIRLS ARE EASY to TRANSYLVANIA 6500 and MR. FROST, Goldblum has earned himself a reputation for the weird genre characters he chooses to play. And Texan Ian Malcolm, the pessimistic mathematical genius who's the first person to suspect all is not quite right in Hammond's self-enclosed universe, would seem to fit that description too. Said Goldblum during a short promotional visit to London, "I don't go after strange roles. They just seem to be the ones I'm most attracted to and challenged by. Malcolm was an obvious match to my own personality. And it was nice to feel like I was participating in a big Hollywood movie for a change." Goldblum revealed his character doesn't die the horrible death he does in the book; he lives to compute another day.

To prepare for the role, Goldblum researched the Chaos Theory, the mind-boggling statistical concept which fuels the JURASSIC PARK narrative. "[In the film] I pretended to be an expert on it," said Goldblum, "but it's such a sophisticated thing. I knew a bit more about it than was in the book, anyway. I got in touch with the guys who had developed it [Ivar Ekeland and James Gleick], talked to them, read some more stuff and watched some videos. It's amazing."

One of the major JURASSIC PARK attractions for Goldblum was co-starring with Attenborough, the CHAPLIN director.

Laura Dern and Sam Neill, discovering a sick Triceratops on the park grounds, the only full-size Winston dinosaur shot on location in Hawaii.



In the beginning...Sherlock Holmes creator Arthur Conan Doyle's 1912 novel became a sensational silent film in 1925, thanks to the stop-motion effects artistry of Willis O'Brien

"It's an indication of incredible things to come," noted ILM's Steve Williams. "Now nothing's impossible."

"He's a great guy, terribly sweet, and I really enjoyed working with him," said Goldblum. "I think he enjoyed being an actor again, too, because he seemed to be having a ball."

"Awesome" is the way Goldblum described JURASSIC PARK. "The little bit of completed footage I've seen is spectacular," he enthused. "My part was juicy. I love dinosaurs. The story was great. It'll be very entertaining." As for working with Spielberg, Goldblum said, "I like him and have always wanted to work with him. He's enthusiastic, masterful and inventive, and he was very kind to me. I feel very close to him. We got really friendly because I think he liked what I was doing—well, let's see what bits he uses in the completed film! He was always accessible and we talked about a lot of things. I loved the fact he was always prepared with little notes on paper he'd drawn the night before. But that didn't stop him from nurturing a creative, collaborative atmosphere. 'Let's do this...let's do that...'"

Goldblum painted a picture of Spielberg's creatively charged set. "Often he'd keep the camera rolling and say neat things like, 'Jeff, say that line again but this time like a young boy. Now stand very still and weep a little.' I love that sort of generous working relationship and the fact he was willing to include our thoughts and ideas. He worked like a man possessed on the picture and we finished 12 days ahead of schedule, so there was a great momentum to it. I was expecting it to be a sit-and-wait-around thing, what with the dinosaur stuff. But it was a surprisingly snappy process and Spielberg was the leader of that. We did a lot more of the special effects work for real than I imagined we would."

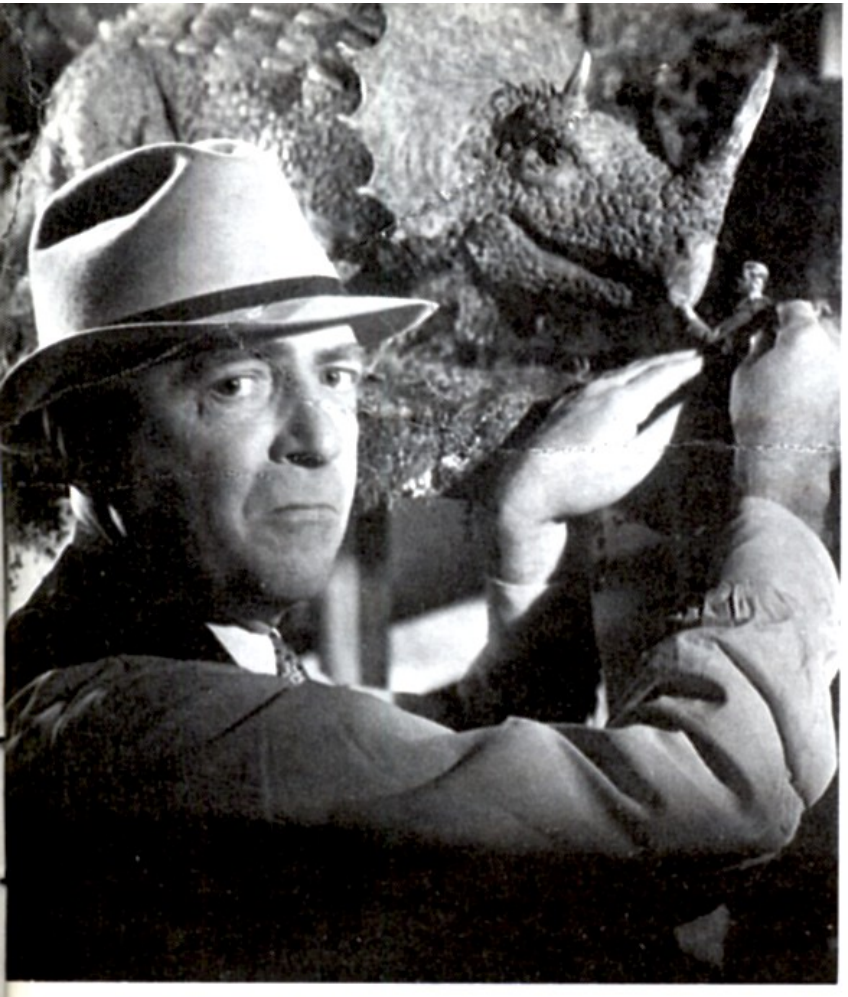
ILM was handed the dinosaur menagerie assignment on JURASSIC PARK after Spielberg saw their computer graphics test footage for stampeding background creatures. Steve Williams, senior animator for ILM's work on THE ABYSS, called the work that ILM's 80-man team is doing on JURASSIC PARK, "A landmark accomplishment to blow your mind!"

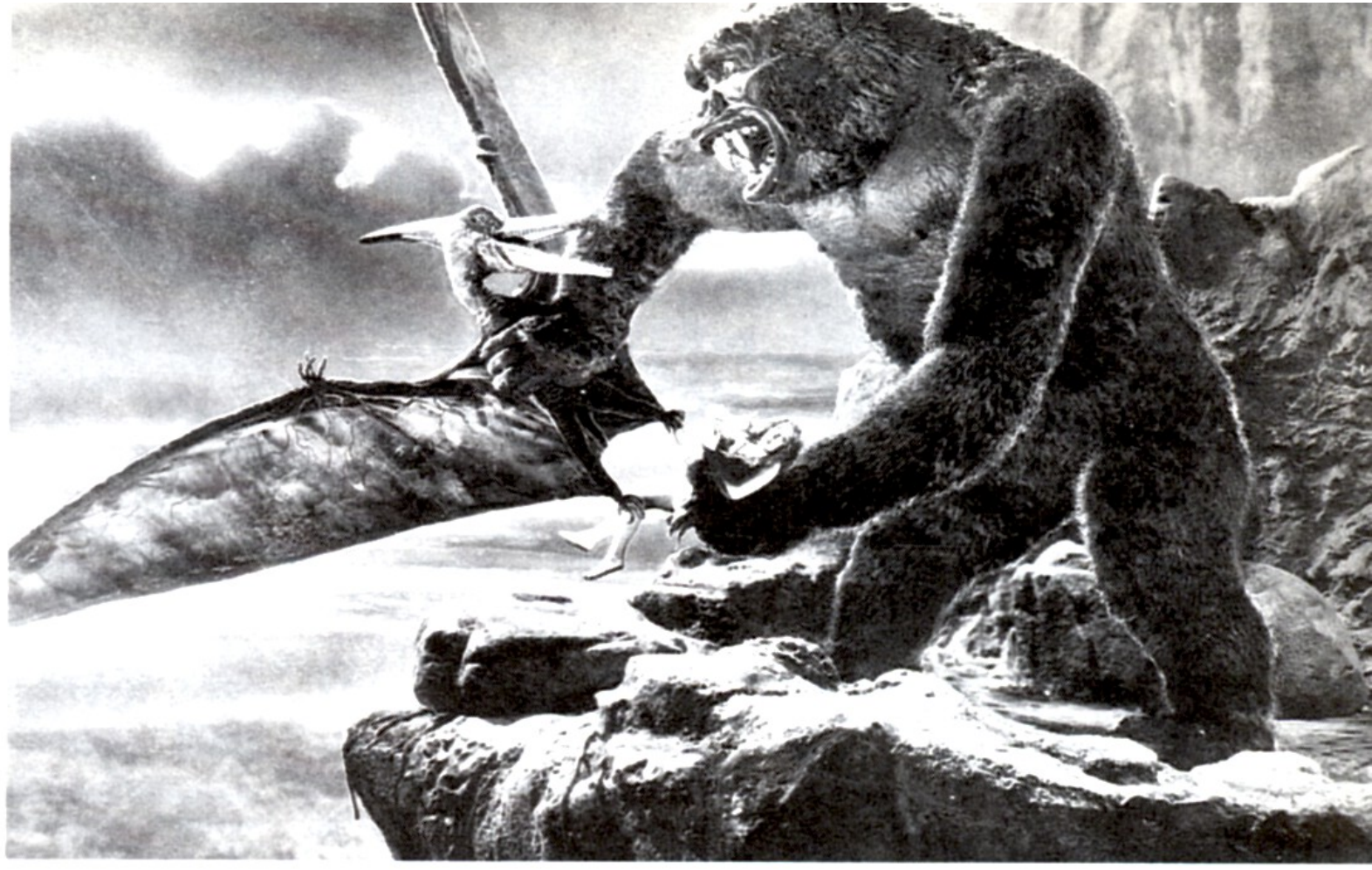
Lecturing on the subject of computer graphics at the 1992 London Film Festival, Williams pointed out the film industry is in the midst of a technical revolution with unimaginable potential, one unequalled since the medium discovered sound. He predicted JURASSIC PARK will prove to be the creative flagship in a pre-planned learning curve. "The computer-generated pseudopod in THE ABYSS was just the beginning," said Williams. "The poly-alloy T-1000 from TERMINATOR 2 was the next step. But these weren't based on anything real, and audiences bought the illusions because they had no comparative frames of reference."

That's why the next step had to be the recreation of realistic skin tones for Meryl Streep's twisted neck in DEATH BECOMES HER. According to Williams, "That programming led to us being able to embark on something as complex as JURASSIC PARK. We're using an elephant skin computer program for which makes one scene as difficult as 20 in TERMINATOR 2. When we were exercising a digital stunt double of actor Robert Patrick [the T-1000 in TERMINATOR 2], the nuancing problems of wrinkling clothes always remained. We soon discovered the special equations to calculate those conditions—how clothes behaved when arms were lifted—and it's these equations we've adapted for JURASSIC PARK."

Further proof that computer graphics will make every other special effects technique virtually redundant comes with projections of technological developments yet on the horizon. Among them Spielberg is currently investigating the use of digital cameras. "That means cameras won't need film," said Williams. "They will shoot solid state, making our jobs even easier, because the image will be stored as a 24 bit image straight away. We won't have to go through the arduous scanning process." Before that can really happen though, directors must grasp the potential of the technology which will soon lead to new movies starring Marilyn Monroe and other past movie legends, as well as the creation of new stars who won't exist except as digital formulas

Sam Neill, Laura Dern and Joseph Mazello, befriended by Brachiosaurs. Inset: Cinematographer Dean Cundey's low-key lighting sells the live effects.





WILLIS O'BRIEN (above) went on to make the greatest dinosaur picture of all time, KING KONG, in 1933. Kong (right) defends Fay Wray from the depredations of a Pterodactyl outside his cave. O'Brien's work inspired generations of other filmmakers, including the likes of effects genius Ray Harryhausen and Steven Spielberg.

on celluloid.

"More directors need to take James Cameron's lead," said Williams. "On TERMINATOR 2, he gave us 49 scenes to work from, none of the camera angles changed and he didn't add anything. On the other hand, Spielberg started with 50 scenes, ended up shooting 150 and was altering every camera angle!"

ILM owner George Lucas is said to be paying particular attention to the JURASSIC PARK innovations. After all, why would he even bother embarking on a STAR WARS IV, before being able to use absolute state-of-the-art techniques? Williams outlined exactly what the latest industry buzz phrase 'grip removal' means. "When a director wants to hang an actor from wires on the set for flying scenes or film a model shot, the problem was always removing the wires afterwards," said Williams. "Well, now we never have to worry about that again as we take each frame of film, scan them through the computer, and digitally remove the wires. But what's even crazier is you don't even need the wires anymore! A grip can just pick up the model, walk around the set simulating any action, and we simply remove him. We had a situation on JURASSIC PARK where a guy was eating his lunch under the lights. He was in the plate, in the negative, everything. We just painted him out. It wasn't a problem. Yet two years ago, it would have been a major panic situation. We can fix anything that's on film: lighting, camera angles, the lot!"

Could JURASSIC PARK be the dinosaur movie we've all been waiting for since ONE MILLION YEARS B.C.? Williams, echoing Goldblum, thinks it will be and so do Universal who know they have the one movie studios will have to schedule their releases around this summer. Had Michael Crichton's book *Sphere* made it to the screen, it would have prefigured the rash of similar themed underwater fantasies. JURASSIC PARK would seem to be the tip of a prehistoric iceberg too. Among the raft of projects waiting in the wings are CARNOSAUR [see page 23] and DINOSAUR ISLAND, the brainchild of Fred Olen Ray and Jim Wynorski, produced by Menachem Golan's 21st Century Film Corporation.

How apt that Spielberg's JURASSIC PARK should be utilizing the exact techniques visionary writer/director Crichton explored in LOOKER where images of starlets and political candidates were created by computers for sinister purposes. Life is indeed imitating art. Noted Steve Williams, "JURASSIC PARK is an indication of incredible things to come. For when people see it, they'll realize nothing is impossible." □

JURASSIC PARK

MICHAEL CRICHTON

The novelist and screenwriter on his adaptation.

By Steve Biodrowski

"Paradigm" was just another word for a model, but as scientists used it, the term meant something more, a world view. A larger way of seeing the world. Paradigm shifts were said to occur whenever science made a major change in its view of the world.

—Michael Crichton
JURASSIC PARK

In his novel *Jurassic Park,* Michael Crichton comes close—or so it would seem to a careless reader—to reworking the standard science fiction plot of portraying the havoc that erupts when scientists meddle in things they were not meant to experiment with. However, instead of telling us that there are some things man was not meant to know, JURASSIC PARK tells us there are things we *cannot* know. The plot of the disaster which engulfs the park is an illustration of the book's theme: that there are limits to our ability to understand and control the world and that science, whose premise is that we can understand and control everything, is an outdated system that needs to be replaced by a new paradigm.

Of course, that's not what's going to draw audiences to theatres this summer. People will come because they want to see dinosaurs roaring and rampaging across the big screen. And as a matter of fact, Crichton originally conceived his dinosaur-cloning story as a screenplay, minus the thematic subtext. "I had become interested in the notion of obtaining dinosaur DNA and cloning a di-

"I had confidence in Spielberg," noted Crichton. "I took first whack, but I really didn't want to do the script."

nosaur in 1983," he recalled of his initial effort. "The script didn't work, and I just waited to see if I could ever figure out how to make it work. It took quite a few years.

"It was a very different story," said Crichton of the original script. "It was about the person who did the cloning, operating alone and in secret. It just wasn't satisfactory. The real conclusion for me was that what you really wanted in a story like this was to have a sort of natural environment in which people and dinosaurs could be together. You wanted the thing that never happened in history: people in the forest and swamps at the same time as dinosaurs. Once that notion began to dictate how the story would proceed, then everything else fell into place, because there are certain things that I wanted to avoid, like the dinosaurs in New York City—that's been done."

Working with his new slant on the story, Crichton opted to write a novel. "I didn't revise the script," he said. "By the time I got around to doing it, there were other considerations. The most important is that it wasn't clear that anyone would ever make this story into a movie, because it would be very expensive. So one way to get the story done was to write a book. I could do that."

Despite the story's origins as a screenplay, the novel expounds on its thematic material in depth, mostly through the character of Ian Malcolm,

Novelist Michael Crichton (l), who adapted his book for Spielberg, on the set of another theme park disaster film,1973's WESTWORLD, with Richard Benjamin.

played by Jeff Goldblum in the film, a mathematician whose eponymous theory "the Malcolm Effect" predicts the failure of the park. Of course, this material had to be condensed or deleted when the story came full circle to being a script again. "I feel very strongly that books should be the best books they can be, and you should not worry about what the movie will do," Crichton said of his uncinematic approach, which makes the novel stand up as a work in its own right rather than a stepping stone to a film deal. "In movies, a little bit of that kind of dialogue goes a long way. A movie like JURASSIC PARK is not the format to have extended discussions on the scientific paradigm."

Crichton did several initial screenplay drafts for Spielberg, retaining the basics of his novel in condensed form. "I think everyone's feeling was they liked the book in its overall shape and structure, and they wanted to keep that. So the question was how to get it on film since there are some parts—but not a tremendous number of parts—where it's clear that you can just lift it out and the structure remains. It was a question of paring down and trying to keep things from the original, simplifying."

Further describing the adaptation process, Crichton went on to note that, "It's a fairly long book, and the script can only have somewhere between 10 and 20 percent of the content. So what you're really trying to do is make a sort of short story that reproduces the quality of the novel and has all the big scenes retained and has the logical flow that appears in the much longer and more extended argument.

"A similar issue has to do with what you call 'visceral things,'" said the author-adapter. "You can have gory descriptions in a book, because everyone is their own projectionist. I've always found it unwise to do that in a movie, because it throws you out of the movie. As soon as you see guts, you immediately think, 'Where did they get them? How did they do it?' You do not believe for a moment that that's actually happening. Since I see it as an insoluble problem to present viscera, the movie wisely doesn't do that. I also think the explicitness of the violence serves a different purpose [in the book]. You don't have certain advantages a movie has, so in a way the violence is a way to say, 'These are real dinosaurs, and take them seriously, O Reader.' In the movie, if they look wonderful, then you take them seriously; you don't have to see them tear people open. Your decision about taking them seriously is based on other things, so [graphic violence is] unnecessary

In the adapting process, Crichton was forced to drop several scenes he would like to have retained, but his previous experience as a screenwriter taught him to be philosophical about the process. Noted Crichton, "Scenes went for all kinds

LEAPIN' LIZARDS have proven to be the bane of dinosaur film fans since producer Hal Roach pitted caveman Victor Mature against an iguana in 1940's ONE MILLION B.C. The optical footage of live lizards, said to have been supervised by the great D.W. Griffith, ended up getting recycled as stock footage in an endless string of low-budget B-films. Animator Ray Harryhausen corrected the injustice in 1967 by remaking the film with "real" dinosaurs.

of reasons: budget reasons, practical reasons, in the sense that they were difficult to do; they went out of the belief that they were repetitive in some way. But I think the primary thing that drives something like this is budget. You have to stop somewhere and where you stop, people will say, 'Oh, that was my favorite scene and it's not in.'"

Although authors sometimes adapt their own novels to the screen in order to try to protect their work from hampering filmmakers, this was not Crichton's intention; in fact, he did not initially intend to do the adaptation himself. "I didn't have it in my mind to do the script, but Steven said, 'We really need somebody to pare this thing down into some kind of manageable shape so we know what to build and it has to happen fast.' I said, "I do have the advantage of having tried many versions of this, so I know what works; I'll whack it down. Then when you want to do your character polishes, get somebody else.' I really wasn't able to stay with the project for three years; I had other things to do. I really didn't want to do the script; I had a lot of confidence in Spielberg.

"There are disadvantages to having the original writer," continued Crichton. "People think writers fall in love with their own words. I don't have any sense of that at all. What's difficult for me is that in doing a story like this, you do several drafts which change the story dramatically from one to another—at least that was what happened in this book. So you've rethought it several times; now you have to rethink it again for a movie, and it's just hard to rethink it too many times. It's hard to take the same elements, toss them up in the air and rearrange them again and again and again."

Crichton is confident that those elements have been rearranged into a satisfactory order. "I think it's going to be a pretty amazing movie," he suggested enthusiastically. "I think it's going to have stuff in it that people will be floored by—they are not going to believe what they see. That's always nice." □

JURASSIC PARK

STOP MOTION'S EXTINCTION

Producer Lata Ryan on axing the animation.

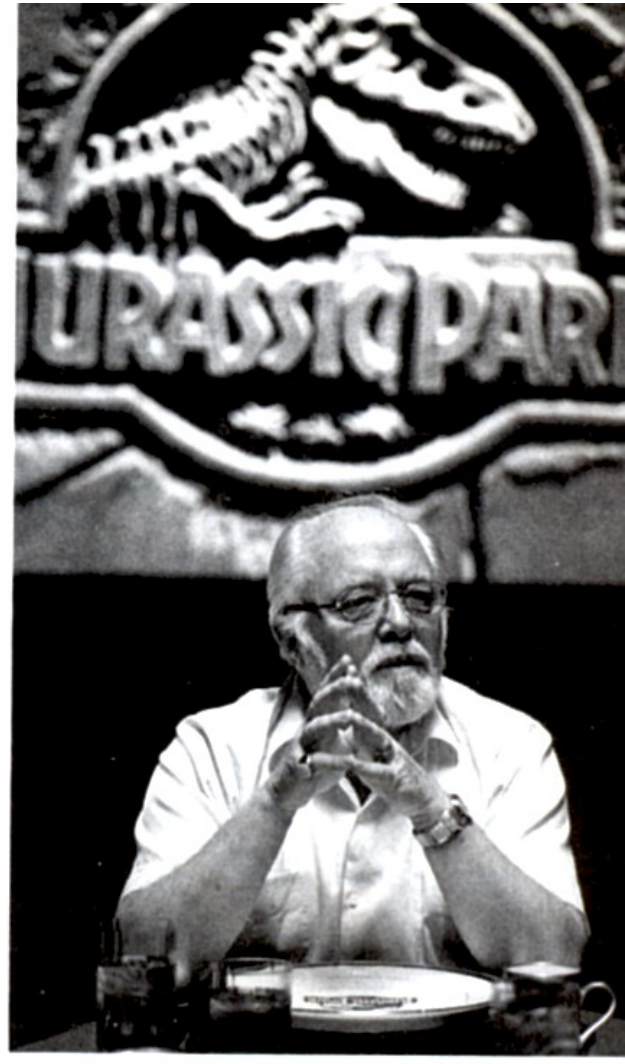
By Steve Biodrowski

While Steven Spielberg and Kathleen Kennedy were finishing HOOK, preproduction on JURASSIC PARK was being supervised by associate producer Lata Ryan and production designer Rick Carter, who co-ordinated the efforts of design team Dennis Muren, Phil Tippett, Stan Winston and Michael Lantieri. "We felt they were all peers—nobody was higher than anybody else," explained Ryan. "We brought Phil on for his animated personality and knowledge of movement. If you were going to do a CGI flock of birds, you could study their movements, but what do we have for dinosaurs? We really looked to Phil Tippett for that: he feels he's a dinosaur himself—in our meetings, he would get up and start acting like a Raptor."

In the beginning, the ball was mostly in Stan Winston's court while his crew drew sketches and sculpted fifth-scale mock-ups of the life-size puppets to be filmed during principal photography. However, between 35 to 50 shots were planned for Tippett's post-production go-motion filming of the T-Rex, Raptor and Brachiasaurs. Also under consideration was the use of computers to create a shot of a dinosaur-stampede and to add blur to conventional stop-motion animation.

"We wanted to offer Steven a 'menu' of techniques, so we even explored adding blur to stop motion," said Ryan. "Dennis used some of Phil's early tests, which we called a 'Bible of Movements.' Phil made inexpensive stop-motion puppets of the Raptor and the T-Rex to show the different movements to Steven and Stan [Winston], who used these tapes to figure out how to move his mechanical dinosaurs. Adding blur was expensive, but we couldn't afford not to explore every possibility. Then we could tell Steven, 'In the time frame of post-production [instead of go-motion], we can offer you less expensive stop-motion shots.

"Dennis meanwhile went forward with the exploration of the CGI, stampede shot. We knew that if we were making this movie two years later, it could all be CGI, but we weren't going to postpone; then after the success of this exploration, Steven and Dennis agreed that we could do CGI now. We had to make this big decision to eliminate the go-motion. It was a heavy day. We all loved Phil—he was an integral part of our team, and we wanted him to stay. It took a lot of time to talk him into staying."

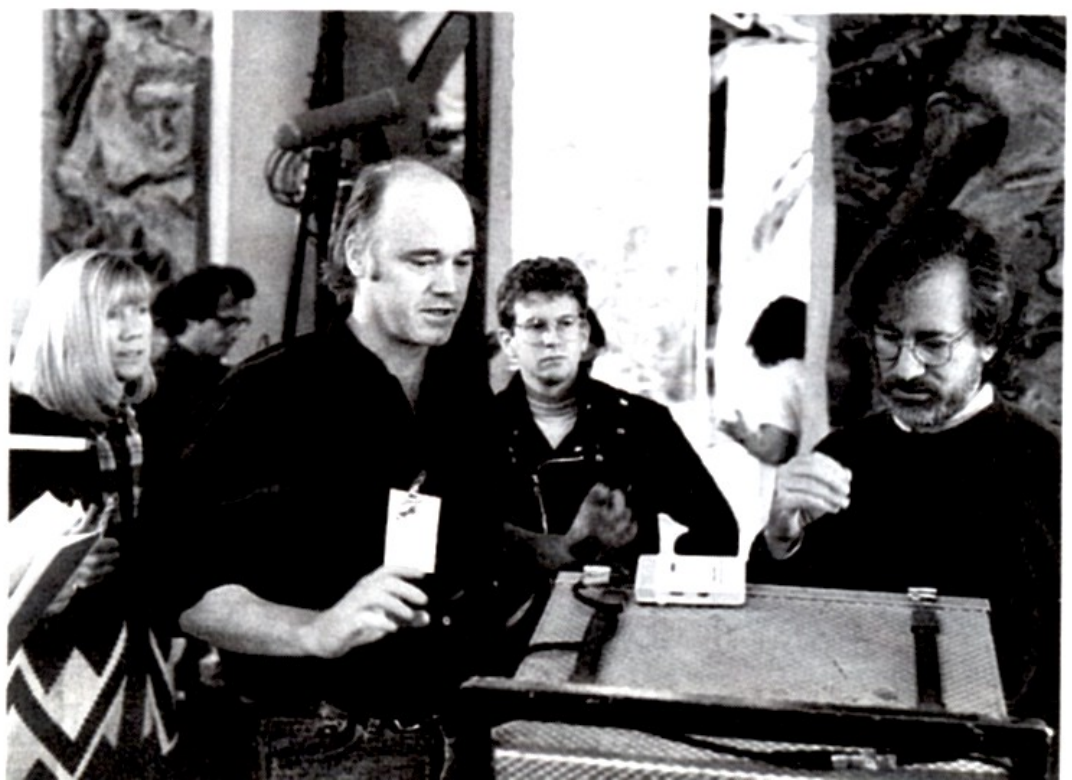


Richard Attenborough as billionaire John Hammond, the park creator patterned by Spielberg on Walt Disney.

ILM designed a Dinosaur Input Device—or DID—to allow Tippett and other animators to define the movements of the CGI dinosaurs. "It allowed him to come into the future," said Ryan. "We compared it to the dinosaurs being extinct: go-motion may be extinct. The DID let Phil add his personality to the dinosaurs. You could get an animator, a computer wizard, who'll make a fantastic dinosaur, but could he get the movement? 'Lata,' he would say to me, 'look at your arm—you're not even aware of how many points of movement there are!'"

Ryan concluded, "I think the success of the movie is due to the two years of preproduction which gave us the time to make that breakthrough with computer graphics. People talk about preproduction all the time, but they never do it. We actually did." □

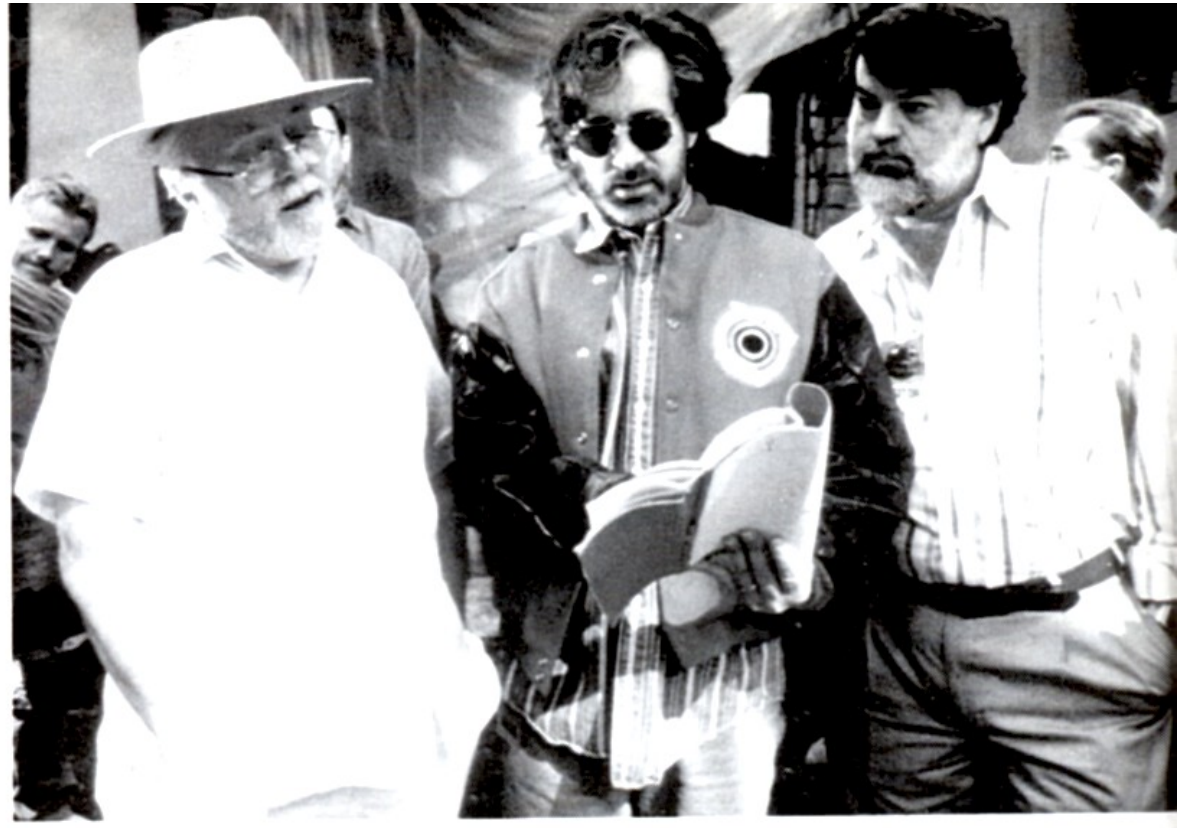
Associate producer Lata Ryan (r) dinosaur movement supervisor Phil Tippett and Spielberg review Tippett's stop-motion "animatics" to help block out the action.



JURASSIC PARK

FILMING THE DINOSAURS

Cinematographer Dean Cundey on lensing effects.



Cinematographer Dean Cundey (r) goes over the script with Steven Spielberg and Sir Richard Attenborough, planning the camera tricks to hide the effects illusion.

By Steve Biodrowski

Working closely with effects people was a big part of JURASSIC PARK for cinematographer Dean Cundey because Cundey's photography was to be combined with elements photographed by others. Noted Cundey, "I think that's one of the great challenges for a cinematographer on an effects film: helping the effects people blend with the photography. Success is implying as much as you can. It's a case of sketchy lighting, cross lighting textures, keeping areas of the creature shadowy. Most of the time, the creatures in JURASSIC PARK are supposed to be menacing, so the tendency is to keep them in shadow. You choose camera angles that seem logical and at the same time hide things you don't want to see. So it's showing as much as you need to and as little as you can.

"Steven [Spielberg] is one who is great for creating the striking image, the one that is very attention-getting. The challenge is to create those dramatic moments and still give the audience a sense of reality, that they are not suddenly aware that you have created this striking image."

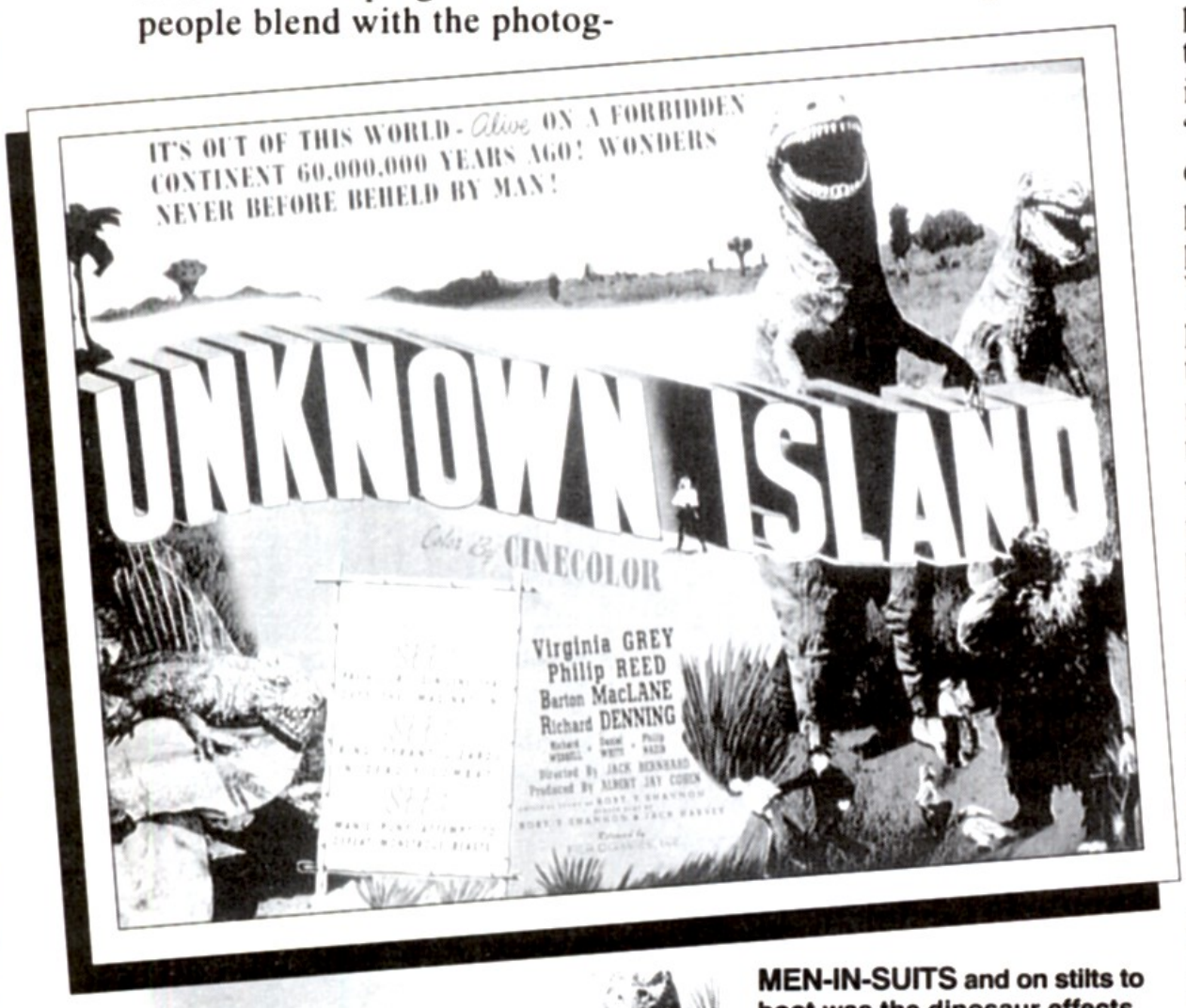
Cundey credited meticulous planning and storyboarding by the filmmaking team for pulling off the complex project. "We had almost every kind of effects possible: mechanical puppetry, people in suits, computer imagery, motion-control. When you commit to doing a particular shot, you're committing to quite a bit of time and money, so it is incumbent on the director to know exactly what pieces are necessary to tell the story. The storyboard becomes the real bible that you follow."

Cundey's effects challenges were photographing Stan Winston's mechanical creatures and photographing empty space for computer-generated creatures to be added later. "Getting mechanical creatures to look real is always a challenge," said Cundey. "No matter how good the creatures are, if they're lit very flat and shown in static shots, you have a chance to look and examine and discover why it doesn't look quite right. As the cameraman, I have to be aware of the limitations.

"The other challenge was the unknown, the computer-generated imagery, the dinosaurs that were going to be built from scratch, so to speak, in the computer and blended on film with the live-action world. My experience photographing WHO FRAMED ROGER RABBIT was valuable from that standpoint. You develop a sense of what it would be like adding a two-dimensional image into film at a later time. How you can help it to look real with lighting and camera position. I approached it from that experience. Having seen the stuff they're doing, I have to say it's amazing. It's a thrill seeing these dinosaurs."

A third challenge was matching the mechanical dinosaurs with their computer counterparts. "With any effects film, you try to mix up the effects, to keep the audience guessing," said Cundey. "I think that's one of the great things about what we did—a very careful mixing of techniques. In this case, one of the contributing factors was cost. Computer-generation at this point is still very expensive. It would have been easier for us to say, 'Oh, this all will be generated' and then go on our merry way of shooting anything we wanted before turning it over to ILM's Dennis Muren and saying, 'Here, now fix this.'

"Here's what was done: the sequences were storyboarded according to Steven [Spielberg] and the artists' ideas of the ideal way to create the action, without regard to the technique. Then those were evaluated, and it was determined what had to be computer-generated, as far as wide shots or watching a



MEN-IN-SUITS and on stilts to boot was the dinosaur effects innovation of 1948's UNKNOWN ISLAND, the first effort to film its prehistoric fauna in full color. The suited saurians by Ellis Burman were filmed live and in process shots designed by Howard A. Anderson to composite the beasts with a cast that included Richard Denning. Without the stilts, the Japanese were able to make it work six years later, and created a sensation with GODZILLA.

JURASSIC WANNABE

DINOSAURS ATTACK!

Waiting in the wings, filming Topp's bubble-gum gorefest.

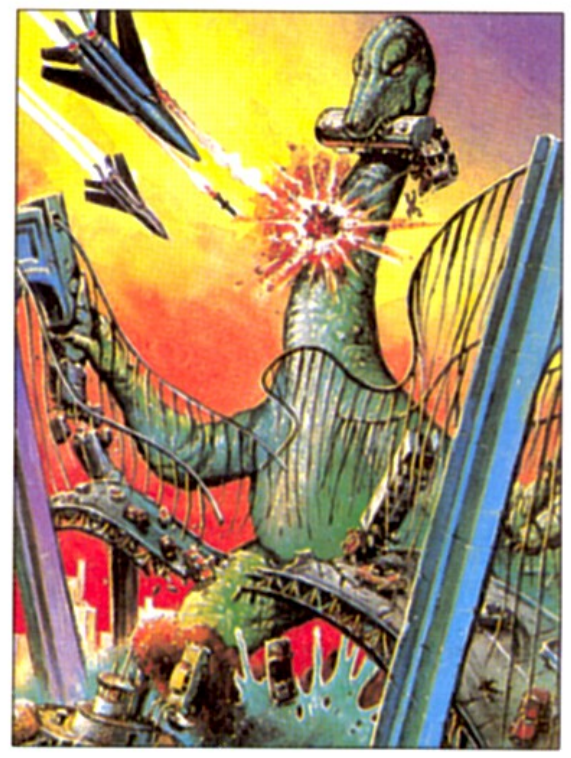
By Steve Biodrowski

The announcement of a film like JURASSIC PARK creates a ripple effect among smaller projects dealing with similar subject matter, pushing some into production and sinking others either back into development or else into complete oblivion. Two of the latter are THE LOST WORLD, based on the novel by Sir Arthur Conan Doyle and DINOSAURS ATTACK!, based on the Topps bubble gum cards created by Gary Gerani.

THE LOST WORLD was to have been directed by John Landis, who told fans at a convention last year, "We actually had a great script by Richard Matheson, with Sean Connery as Professor Challenger. We were going to do a very traditional, old-fashioned adaptation of Wells' [sic] book. Unfortunately, it was in development at Universal, and when they bought JURASSIC PARK, they said, 'We don't want to do THE LOST WORLD.'"

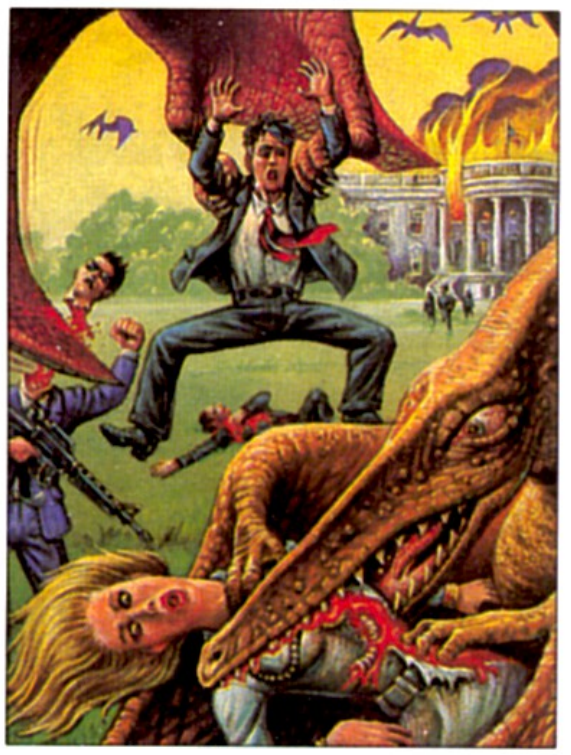
DINOSAURS ATTACK! began life in 1988 as Gerani's homage to the MARS ATTACKS! cards of the 1950s. "The dinosaur thing was really hot," said Gerani. "I suggested Topps do one of those wonderful, blood-thirsty adventure series they do best, with dinosaurs instead of Martians." Gerani, then a Topps executive, received no credit for his creation. "The scientist who starts all the trouble is based on me," he noted. "We took photos of everybody at Topps to use as reference for victims."

Gerani took the cards to Joe Dante and Mike Finnel, who optioned the property for a film to be directed by claymation expert Wil Vinton, from a screenplay by Charlie Hass (MATINEE), but Gerani is not pleased with the direction the project took. "I have a screenwriting background [PUMPKINHEAD], so I gave them a treatment, which they very nicely rejected. The treatment was essentially an extrapolation of the cards into a fully developed storyline. I used that as the basis for a graphic novel. Over the course of 55 cards, you want some thread of story, but essentially what you're selling are in-your-face images.



"Originally, in all fairness to Dante, they did try a version which was pretty close to what I created, in terms of tone—sort of half-serious, with the satire around the edges and the first pass at the script was good," continued Gerani, "but then, because JURASSIC PARK reared its big, ugly, Spielbergian head, they became intimidated, because nobody was going to be able to match the magnitude of that. At the same time, Joe and company were developing DINOSAURS ATTACK! as a

continued on page 60



Director Joe Dante has toyed with filming Topps' deliciously gory bubble gum card series created by Gary Gerani in the late '80s, along with product developers Art Spiegelman and Len Brown. Gerani designed each of the 55-card set, penciled by Herb Trimpe, John Nemec and George Evans, which were painted in movie poster/ pulp cover style by Xno, Earl Norem, John Pound and James Warhola. Dante and producer Mike Finnell plan to turn the cards into an AIRPLANE! spoof.

JURASSIC FANATIC

PHIL TIPPETT, DINOSAUR

Faced with animation extinction, he adapted to a CGI world.

By Lawrence French

A full-scale Velociraptor, terrorizing the park's cafeteria, created by Stan Winston's mechanical effects group, filmed with the aid of Tippett's stop-motion storyboards.

Willis O'Brien's pioneering work with dinosaurs on KING KONG and THE LOST WORLD has inspired many of the stop-motion animators working today, and Oscar-winning effects expert Phil Tippet, who supervised the dinosaur movements of JURASSIC PARK is certainly no exception. "Dinosaurs are a passion I've had since I was a kid and first saw KING KONG on TV," said Tippett. Another early influence was a mid-'50s article in *Life* magazine on dinosaurs. "It featured these magnificent murals from the Museum of Natural History," said Tippett. "It wasn't long before I was building and animating my own dinosaur models."

Although JURASSIC PARK will mark the first time Tippett's work with dinosaurs has reached the big screen, his stop-motion passion for the subject led to a short film, PREHISTORIC BEASTS, and an unfilmed feature, DINOSAURS, he was to have co-directed with Paul Verhoeven for Disney. "Dinosaurs were one of the reasons I got into this field in the first place," said Tippett.

"It's a way of reconstructing the past. I find the whole drama of the Mesozoic era to be very exciting. To me, it's extremely pertinent information that gives meaning and context to who we are. Our mammalian antecedents really go back to the time of the dinosaurs, when they were suppressed for millions of years. It wasn't until the mysterious demise of the dinosaurs that mammals really flourished. To be able to do something that speaks about that is a passion I've had since I was a kid. Now I've become an amateur paleontologist, and I periodically get together with other paleontologists, like Rob Long of U.C. Berkeley, who's done a lot of work in the Triassic period."

After toiling on effects at ILM for about seven years, Tippett decided to take a year off in 1983 to follow his passion and work on his own short film called PREHISTORIC BEASTS. The project took two years to complete and ran about ten minutes. Footage from the short was combined with other dinosaur scenes animated by Tippett's Berkeley studio for an Emmy Award-winning CBS-TV special DINOSAURS! in 1985. That hour-long peek at the late Cretaceous period was the first accurate stop-motion look at some of the more recent scientific discoveries about dinosaur behavior. Tippett's animation depicted a pair of Hadrosaurs protecting the eggs in their nest from [Deinonychus] predators, and then tending their young after they had hatched, ideas put forth by JURASSIC PARK's technical advisor, paleontologist Jack Horner after his discovery in the late '70s of the spectacular nest of Maiasaura eggs in a Montana hillside.

"Deinonychus wasn't discovered until the late '60s," noted Tippett of the species akin to JURASSIC PARK's vicious Velociraptors. "John Ostrom of Yale uncovered its bones in Montana. That was really the lynch-pin that inspired the whole warm-blooded dinosaur theory. Animals couldn't have been built like that, and have those weird predatory toes, if they weren't kind of quick moving. It was antithetical to what everyone had been thinking about reptiles at the time."

Tippett's unfilmed "dream project" with Verhoeven—also titled DINOSAURS—was an idea hatched on the Dallas set of ROBOCOP in 1987 as Tippett, Verhoeven and producer Jon Davison killed time during a lull in the filming. "It was a very bad day on the set," recalled Tippett. "While we were all sitting around in the heat, I said, "Hey, how about if we all make a dinosaur film?' Everyone agreed that would be great."

Tippett provided the backbone for the dinosaur movements of JURASSIC PARK, shown animating a Hadrosaur for the award-winning documentary DINOSAURS!

Laura Dern and Joseph Mazello (r) under attack by the rampaging T-Rex. Tippett's stop-motion tests helped define the movements for live shots.

Davison set up a meeting at Disney with studio chief Jeffrey Katzenberg, along with Verhoeven and Tippett, and pitched the project. Katzenberg responded favorably enough to have Disney put up the money to develop a script. Davison hired Walon Green to write the screenplay. Green was known for his National Geographic special on reptiles and amphibians, as well as THE HELLSTROM CHRONICLE, a terrific documentary on insects with science fiction overtones.

"Walon wrote this very interesting script that I liked a lot," said Tippett. "It was a look at the late Cretaceous period, 80 million years ago. You can imagine the kind of thing Paul Verhoeven would be interested in. It was very visceral and prehistoric without any people or narration. We were very adamant that the dinosaurs should behave in a particular way, very true to life. We hoped to get our ideas across by using pantomime, music, sound effects and carefully constructing the scenes. It would basically be a silent movie. There would have been a bit of a problem in sustaining the narrative, but it's been done before [as in QUEST FOR FIRE]. We all got carried away though. The script would have cost a lot more than we told Katzenberg. He was justifiably concerned about that. But instead of trying to whittle it down, Disney wanted to make some pretty substantive changes to what we had planned. They wanted to turn the dinosaurs into Disney-esque animals."

The planned film got no further than the script stage, and some initial storyboard sketches drawn by Phil Norwood. "It was going to be my big break," said Tippett of the plan to have him co-direct the project with Verhoeven. "Paul was going to design the sequences and work with Walon on the script. Then we'd go out on location and shoot the backgrounds. Paul would go off and direct some other movie and I would do the animation. Finally Paul left the project and the last time I talked to Disney I got out of it as well. Disney owns the script, so it may still be done, but for all I know they could turn it into a cartoon. Who knows, they might even put fins on the back of iguanas."

Of course, if JURASSIC PARK hits the summer jackpot, Tippett could find renewed interest in the project from Disney. □

"Success is implying as much as you can with lighting," noted Cundey, "keeping the creature shadowy."

creature turn, and what could be mechanical, which was usually a creature that was stationary, that had already arrived in the frame. One of the great limitations on any mechanical creature is having them walk full-figure. Another consideration was to what extent did they have to interact with the real world. It's easier to have a mechanical creature hit objects and move around people than it is with a computer-generated one. The sequences were broken down by that kind of criteria."

Finished with prep, the crew spent its first week of filming on location in Hawaii, where they encountered a hurricane. "Our farewell party was quite a blow-out," laughed Cundey. "We had quite a time surviving that—which fortunately didn't do tremendous damage to our schedule. We went back for a weekend to pick up the one day lost. In retrospect, it was quite an adventure for those on the film."

Cundey was impressed with the way the cast adapted to shadow-boxing with invisible dinosaurs. "It's always interesting when you watch actors, who are used to reacting and relating to other actors, learn how to see things that aren't there. It's the same thing that we do on the craft side of it. The camera operator, for instance, Ray [Stella], who worked with me on ROGER RABBIT, is now used to photographing things that aren't there. Camera operators are used to working on reflex: they pan, they tilt, they compose—based on what they see in the frame. As an actor enters or sits down, the operator adjusts to make sure the composition is pleasing. When you're photographing a shot of something that's supposed to be there, but really isn't, your reflexes are different. That's also true of actors—learning to see stuff that isn't there and thinking about how you would react."

The predatory Velociraptors, on the same scale as the humans, were the most interactive effects. "As a result, you have to give them more life," said Cundey. "Their mobility is greater, so the challenge is to create the illusion that they are alive and moving...as opposed to some of the larger creatures, which are like photographing an elephant—they're slower and they're part of the ambience, so they don't have to interact with the characters as extensively." Cundey employed moving camera work extensively to give the Velociraptors life. □

One of Winston's cable-controlled Velociraptors in the wild, capable of only limited live-action movement.

JURASSIC PARK

COORDINATING THE EFFECTS

Michael Lantieri on CGI's interface with floor efx.

By Steve Biodrowski

Gone are the days of yore when creating dinosaur special effects would be supervised by a single person like Ray Harryhausen. JURASSIC PARK was a coordinated team effort involving a variety of techniques: makeup, mechanics, CGI and go-motion. "With the cost of things these days and the amount of time you have to do them, it would be impractical to rely on a single person," said Michael Lantieri, whose official title is "Special Dinosaur Effects."

Added Lantieri, "[Harryhausen] certainly was the best at it, and—who knows?—in this day and age he may have still been doing it that way. We tend to function a lot faster, and everyone tends to specialize—because, if you don't pick an instrument and play it well, you tend to fall into the mediocre group of a lot of people who want to do what you do."

According to Lantieri, JURASSIC PARK "was a bigger group effort than I've ever been involved with. When this whole thing started, they assembled a design team: [makeup effects expert] Stan Winston, myself, [ILM supervisor] Dennis Muren, and [stop-motion animator] Phil Tippett, with [production designer] Rick Carter in the center to liaison between us. We looked at what had to be done and considered all manner of ways of doing it, then cut up the pie. My primary responsibilities were the live-action effects, the floor effects and interfacing between Stan and the visuals at ILM.

"Steven's take was he wanted as much to happen live-action as he could and still save those great moments that can't happen live—like a full-shot of a running Tyrannosaurus—for the right spots in the movie," Lantieri continued. "So Stan and I worked very closely together. Stan started sculpting and making skins. I started designing ways to move and support them, gimbal them, track them from the ceiling. This was by far the toughest movie technically that I've ever done. Just moving any of these things takes time. Sometimes we had to open up the stage floor and anchor them into bedrock, because you're moving this weight around that could tear itself off the floor. For the Velociraptors, which move fast, we had a set specially constructed above the ground, so we had access through the floors. We had dollies that would attach through slots in the floor for fast movement and we had puppeteers hidden behind counters."

Full scale behemoths have been attempted infrequently in the past—KING KONG (1976) and BABY—with mixed results. "One of the problems you have with creatures of this size is getting the motion smooth—because you have *lots* of weight. We basically started from the ground up and decided to use lots of hydraulics, high-flow big-volume proportional valving to make everything move slow and smooth, as well as do interactive

WILLIS O'BRIEN'S LEGACY
Ray Harryhausen's 1963 low-budget reworking of the climax of Conan Doyle's *Lost World* (above). Harryhausen's ONE MILLION YEARS B.C. (left) featured a fight with a baby Allosaurus that will be tough for JURASSIC PARK to beat. William and Edward Nassour's overlooked BEAST OF HOLLOW MOUNTAIN (1956), from an idea by O'Brien, was the first dinosaur film in color and scope.

Laura Dern and special effects supervisor Michael Lantieri's prop car, rigged to crush itself to film the sequence where it is ravaged by the rampaging T-Rex.

things."

Those "interactive things" will help set JURASSIC PARK apart from previous dinosaur movies. "I think you'll be very surprised," Lantieri avowed. "We tried to have great interaction between dinosaurs, real people and tangible items like the car that gets crushed, so it doesn't look like it's all filmed in layers of different elements. Even a few years earlier, with puppets and go-motion—they didn't necessarily come in contact with anything: you would see them in miniature. We don't have many miniatures. We have, I think, one shot that Phil is working on: the car going over the cliff and landing in the tree. Everything else you see is full-size and happening live. When you see a dinosaur smashing a car, it's more or less happening."

The "more or less" refers to the fact that, although the dinosaur and the car were photographed together on the set, it wasn't the dinosaur that crushed the car; it was the car that crushed itself. "You really couldn't knock the car over with the dinosaur or crush the roof," explained Lantieri. "We had to control all those elements with cables, winches and rams. We built a car that crushes itself, a Ford Explorer that's a tour vehicle."

Such potentially dangerous interactive effects sometimes required visible wire work which could be removed later. "We have the ability now to use cables that are a little bit heavier, or even rods for rod-puppetry, that we remove digitally later on. It allows us to keep a clean frame and still control things. For example, we built a hydraulic descender to lower the car on cables. We had hydraulic tree limbs, fully controllable, that we could break a little at a time, building the suspense. So at times we had cables fully visible, because there's no way we could have two children underneath that car and not know for sure that the car would do only what we wanted it to do.

"There was a tremendous amount of safety precautions taken, because of the weight and power of the creatures," continued Lantieri. "Every morning we had to say,'We have a three-ton creature that is capable of maybe blowing a hose and falling on people.' So every shot was meticulously storyboarded and we stuck very close to the boards. Steven spent a tremendous amount of time in prep, more than I've ever seen, working things out. We worked everything through to keep it safe but still keep a fast pace—there's no excitement if you have this slow, lumbering beast that everyone could run away from."

Because of the experimental nature of the work, sometimes a variety of techniques were tried to accomplish a single effect. "It wasn't so clearly defined," said Lantieri of the overlapping responsibilities. "No one had the answers. We would try different things and if one wasn't working, someone else would rush in with an idea. There were roles clearly defined by the storyboards. If we had the T-Rex, we knew we needed a crane to move him, but all of the in-between was decided pretty much on the spot, and we had to be flexible. There are scenes we shot live action, and we backed them up with a VistaVision plate, in case we had to enhance the frame optically. We did a lot of that, backing each other up."

"One of the problems with creatures of this size is getting smooth motions," said Lantieri. "We used hydraulics."

Under the circumstances, coordinating the various departments was essential to remaining on schedule. "There was nothing to shoot around," said Lantieri. "If you show up and your great big thing is not ready, then everybody can just go home. You're ready or you're not—there's no in-between. You don't shoot around a 'Raptor or a T-Rex—it's the star. So everybody had to be ready even if it took working nights around the clock or weekends at home."

With the emphasis on full-scale effects, go-motion took a back seat despite the presence of Tippett. "There's not any go-motion in the movie, at least that I know of," claimed Lantieri. "There might be one shot. Believe it or not, that was one thing that was in question. It's been done before and it was a good backup, but we really went after the effects on a large scale. Phil Tippett is 'Dinosaur Motion.' He's still doing the same thing he would usually be doing, minus making the puppets. He made our fifth scale puppets and built them for a range of motion to be copied, but in terms of photographing them and putting them into the movie, there's going to be little of that, if any. He basically went through all the motions, saying, 'Here's the way the T-Rex should move.' He was really directing the dinosaur movement."

Lantieri similarly deemphasized the computer-generated dinosaurs. "That's being played down quite a bit," he said. "There is some of it, but they're not advertising it. I don't know why. It's a marketing ploy. They don't want all the tricks known. There's some CGI work, but the bulk is done full-scale."

One kind of effect Lantieri did not have to worry about was pumping blood, because the film excises most of Crichton's gory descriptions. "We were trying to hang onto that PG-13 rating and make a 'stalking' movie rather than a 'slasher' movie," said Lantieri. "It's not too gory. We did show certain things, but it's more of a RAIDERS OF THE LOST ARK movie, with the car stuck in the tree over the cliff—it's like the boulder chasing Indy. It's more of a thriller/suspense picture than DRACULA. The movie, while it isn't exactly the book, is a little bit better. In the book, I thought some of the characters were a little weak, maybe; you get to know them better in the film." □

Lantieri, making tracks on the set, during filming on location in Hawaii.

JURASSIC PARK

DINOSAUR MOVEMENTS

Phil Tippett on making the prehistoric beasts live.

JURASSIC PARK's dinosaur movement supervisor Phil Tippett animates a stop-motion Monoclonius from his own documentary short PREHISTORIC BEASTS.

By Lawrence French

Effects expert and dinosaur fan Phil Tippett began working on JURASSIC PARK in November of 1991, as part of the dinosaur design team that included Stan Winston, Michael Lantieri and ILM's Dennis Muren. Though Tippett shot stop-motion "animatics" with conventional puppets for some key scenes during preproduction—used as a guide during principal photography—the dinosaurs on view in the film are either Winston's live-action full-scale props or ILM's computer graphics. But movement was still the key, and that's what Tippett's animatics provided. Think of it as stop motion with computer models.

Among the species on the isolated Costa Rican 'Isla Nublar' is the Dilophosaurus, which spits a poisonous enzyme at its hapless victims, a huge Brachiosaurus, a sick Tricerotops and a herd of stampeding Gallimimuses. Tippett's challenge on the film was to define the behavioral aspects of the dinosaurs, mainly the Tyrannosaurus Rex and the vicious and highly intelligent Velociraptors. A relatively new discovery in the dinosaur pantheon, Velociraptors are small, speedy predators, capable of running and jumping, first discovered in Asia. With a large sickle-like claw on their middle toe, the bird-like beasts walked upright on their two hind legs, their talons effective as weapons in slashing their chosen prey, quite possibly much larger dinosaurs, which they may have hunted in packs. Of the over 350 known species of dinosaurs over half have been discovered in the last 20 years. "It's amazing how recent discoveries have mirrored the movie," said Tippett. "I think they found a Dromaeosaur [the family branch of both Deinonychus and Velociraptor] in Utah that was bigger than any previous find. That added some justification to the size of the 'Raptors in this, because technically they are little animals that are only four feet high. We have a number of scenes with them where there are multiple animals, although everything is truncated by the budget. So the pack of eight or nine 'Raptors shrinks down to three or four."

The foyer of the dinosaur theme park's visitor's center. According to Tippett the bones dictate the moves.

"I've actually spent years looking into dinosaurs and I've come to the conclusion that most of the design work has already been done for you," said Tippett. "If you follow the scientific information, the animal's joints go together in very specific ways and that more than likely indicates how they would have moved. You just have to communicate that to other people, which is a big problem. For all of the main sequences we had extensive storyboard meetings. Once Steven [Spielberg] was happy with the way a sequence was blocked out, Dennis and I would work on the different kinds of action routines for the dinosaurs. Then we'd send that to Spielberg, and he would either accept it or ask us to integrate other aspects of behavior or action into the scene.

"From there we built the models as foam rubber puppets, and shot the animatics, which we could then have as a reference on the set. The actors could look at the animatics tapes and see what they're supposed to be reacting to, instead of having a big cardboard cutout on the set." Tippett's crew filmed rough stop-motion animatics for about 50 shots over 18 months.

In the past, full-scale mockups of dinosaurs in films like BABY have proven to be nowhere near as authentic as using stop-motion models. "Sometimes they can be a real problem," admitted Tippett. "You're dealing with the physics of real time and space which on the set is really at a premium. That's why we have the animatics. It's all broken down pretty logically so we know which shots will work best for full-scale props, saving the more ambulatory movements for animation later."

As a guide to animation, test footage was shot of wild animals in parks and zoos. "For the two-legged dinosaurs like the 'Raptors, we looked at ostriches and emus," said Tippett. "For a sense of something big that's walking, we used elephants. You really don't have a lot of choices. If you want something with a long neck, there's a giraffe." Tippett also consulted his personal library of paleontology books, including *Dynamics of Dinosaurs and Other Extinct Giants* and *Trails and Tracks of Dinosaurs*. "They have theories on how the dinosaurs moved," said Tippett, "what their gait and footfall patterns were."

Tippett wanted shots of the 'Raptors to be extended takes so audiences would be able to study the animals. Noted Tippett, "It posed an interesting problem, because what do you do to keep a scene alive if the animals aren't doing anything? I decided to have them do this routine where they'd shoot out their tongues, instead of cutting away.

Tippett's plan ran afoul of Jack Horner a preeminent paleontologist from the Museum of the Rockies in Montana, who served as the film's technical advisor. "Spielberg has been a real stickler about making the animals paleontologically correct," said Tippett. "Jack was

Tippett (l) and Randy Dutra animate two of the documentary's Sauropods. They worked as a team on JURASSIC PARK's stop-motion "animatics" filming guides.

on the set when I was doing one of these tongue shots, and he said, 'What are you doing?' I told him I knew it wasn't paleontologically correct, but I thought since the dinosaurs have been genetically engineered, we'd be able to get away with it. He said, 'No, you can't do that! Lizards do that, but these aren't lizards, these are closer to birds. They have no possibility of having a tongue like that. They're five feet tall and stand erect and have big nostrils so they can sniff things in the air. A tongue is made for animals that live close to the ground, so they can pick up molecules that have fallen off things. You can't do it, it's all wrong!'

"I said, 'Okay, we won't do the tongues. Go tell Spielberg.' And Steven ruled, 'If that's what Jack says, take the tongues out.' Spielberg wants the sanction of the scientific community.

"It's been a challenge keeping them as correct as possible, within the context of the movie. The balance you try to achieve is at what point they stop being animals and start becoming monsters. Steven wanted to stay away from that and make sure you don't think of them as Godzillas. I think we've been pretty successful. We've given them behavior patterns that the real animals are supposed to have. Of course the dinosaurs still have to eat people. Otherwise what fun would it be?"

Tippett conceded, however, that significant alterations were needed to tone down the gorier scenes in Crichton's book. "Can you imagine dinosaurs eating babies in a Spielberg movie?" he asked rhetorically.

What promises to be one of the action highlights of the movie comes about midway when a Tyrannosaurus Rex attacks two stalled land rovers on the main road of the park. "That was shot on the backlot at Warner Bros," said Tippett. "We had a big set, all dressed up, that served as our background plate, so we could put the T-Rex into the scene. For all the effects shots Dennis [Muren] and I were right there on the set.

"I had never worked with Spielberg before, so I was amazed at what a perceptive eye he has. He notices all these details which go right over my head. I thought I had a pretty good eye, but his knowledge of lighting and grasp of the scene is tremendous. He's got a very clear idea of where he wants to go with the shots, so we were able to move very quickly with our pre-packaged game plan."

Tippett and Muren had introduced the revolutionary go-motion process for DRAGONSLAYER at ILM in 1981. Their work on JURASSIC PARK promises to revolutionize creature effects again by making use of the amazing computer graphics techniques pioneered by ILM on THE ABYSS and TERMINATOR 2. "ILM was able to prove to Spielberg that there are some distinct advantages to using these new tools," said Tippett. "They've come up with a way to enhance the animation. I'm not actually doing whole shots."

"Spielberg wants the sanction of the science community," noted Tippett. "He's been a stickler for accuracy."

Tippett's animatics crew consisted of Randy Dutra and Tom St. Amand. "Randy put together thick books of possible movements for the dinosaur puppets. We would develop various modes of attack: leaping, running or stalking, all sorts of different routines."

Dutra and St. Amand did most of the hands-on animation. "I hardly ever animate myself anymore," said Tippett. "As director of animation I'll block the scene and make sure the structure is the way I want it. Then it's mostly just direction—make sure it goes from here to there and does this. If there's a problem, I'll come in as a sort of choreographer and work out specific moves and timings. If there are additional problems, I turn into a mechanic and at that point I might as well be doing the shot myself."

During our interview in mid-March, Tippett was still working on the film, communicating long distance with Spielberg, who left for Poland in February to film his next project, SCHWINDLER'S LIST. "Certainly nothing will go by without his scrutiny," said Tippett. "We're sending him tapes of the shots. He scrutinizes every frame. Sometimes that's worse for me because I've had to re-do lots of shots. It's definitely better for the show though, and he's really pushed us to achieve the best work possible." □

CONAN DOYLE REVISITED
Dinosaur movies became a B-movie staple in the '50s, usually with plots unimaginatively recycling the basics of Arthur Conan Doyle's *The Lost World*. This early effort from 1951 starred Cesar Romero, John Hoyt, Whit Bissell, Hugh Beaumont and Aquanetta in the story of an atomic rocket that lands on an uncharted South Seas isle where uranium deposits have resulted in some crude stop-motion dinosaurs.

JURASSIC PARK

PRODUCTION DESIGN

Rick Carter on drafting Spielberg's filmic vision.

Production designer Rick Carter on the grounds of the set of the dinosaur theme park's visitor's center, bringing Spielberg's vision of the film to life affordably.

By Steve Biodrowski

For production designer Rick Carter, JURASSIC PARK has been the most elaborate challenge of his career, a nearly three-year commitment. Hired to design the film in June 1990, while Steven Spielberg directed HOOK, Carter noted, "It was just me, the [book] galleys, Steven and [executive producer] Kathy Kennedy."

Michael Crichton wrote the first draft of the script while the film was being planned. Recalled Carter, "Steven had some very specific ideas about how he wanted to pace it for a two-hour movie—to condense it, and have it pay off in the end. His idea essentially was that the T-Rex escape was the midway point of the movie and from then on it was a roller-coaster ride."

Carter's primary responsibility was "the overall look of the world" and helping to select dinosaurs from the book's action set pieces. "It was always Steven's choice," said Carter. The film's climactic third act, which differs from the book, had yet to be developed. "We even changed part of the ending after shooting some of the sequence and seeing how well it went," said Carter.

With Spielberg finishing HOOK, Carter acted as his liaison with the effects team to determine how best to film the dinosaurs, breaking down each sequence into shots to be filmed live on set or as post-production opticals. Early in the development process, plans to use Phil Tippett's go-motion puppets were abandoned in favor of ILM's computer-generated dinosaurs. "The time has come," said Carter of ILM's rapidly developing CGI capabilities. "We were going to do it with go-motion puppets, for the most part. It was a big jump for Phil to adjust to the idea." ILM's computer graphics are intercut with live action shots of Stan Winston's full scale models, mechanized by Michael Lantieri.

Carter's approach to designing JURASSIC PARK was to give the park an element of "wish-fulfillment." Said Carter, "It's not just an obviously money-grubbing capitalist venture that you hope will fail. By making John Hammond almost Disney-esque, he becomes a metaphor for what we aspire to do."

Designing Hammond's park as a work in progress saved the production a lot of money. "The first budget was like $100 million," said Carter. "We finally got it down to $55 million and with all the pre-planning, we were actually able to make it for that. The development of the script went hand-in-hand with the production design, because both had to key off each other. We had to break it down into things that were doable without stripping it so badly that you didn't have a movie—because you have to deliver on the epic level. I think the second half of the movie will deliver that—there's enough dinosaurs for everybody."

Because of the budgetary considerations, Carter was involved more than usual with practical concerns of production design, not just aesthetics. "I had to be, because it became a question of whether the movie could get made," said Carter. "While Steven was doing HOOK, I would go to him with all these different ideas of how to make things work. It was a very managed production."

Some of the practical concerns that kept Carter busy, even after the film moved into production, involved building sets above the stage so that Stan Winston's dinosaurs could be operated from beneath. Noted Carter, "We had to be very specific about how we created the sets up in the air and where we left passageways for people to get underneath and work the dinosaurs—although we didn't do that anywhere near as much as we thought we would. The T-Rex, when you see it moving in full-shot, it's computer-gener-

B-MOVIE HYPERBOLE sold the dinosaur epics of the '50s to an unwary public. Seldom did the films themselves live up to the hype of their ad campaigns. Take Bert I Gordon's 1955 low-budget saga of astronauts who discover dinosaurs on the planet Nova, a no-name cast, trekking through desert locations, faced with the menace of photographically enlarged lizards. "You'll be shocked! You'll be stunned! You'll be thrilled!" screamed ads. Stunningly bored, maybe.

JURASSIC WANNABE

CARNOSAUR!

Corman's genetically engineered dinosaurs beat Spielberg to the punch!

By Steve Biodrowski

Effects creator John Carl Buechler, with a hand-puppet Deinonychus.

Thanks to JURASSIC PARK, John Landis' WORLD may remain LOST and Gary Gerrani's DINOSAURS may not ATTACK, but that doesn't mean Steven Spielberg will have the prehistoric playing field to himself. A number of dinosaur films are in development or production, including Amblin's WE'RE BACK, a cartoon feature for November release, TriStar's big-budget GODZILLA, for Christmas 1994, and Concorde/New Horizon's CARNOSAUR, which actually opened in May, beating Spielberg to the punch.

"It's a very similar premise," noted CARNOSAUR producer Roger Corman of the competition, JURASSIC PARK. CARNOSAUR is also about genetically engineered dinosaurs, but the veteran producer, with a completely straight face, brushed aside any charge of plagiarism—against JURASSIC PARK. "Our film is from a novel written eight or nine years ago by Harry Adam Knight. I don't know whether Michael Crichton or Steven Spielberg ever read *Carnosaur*. I don't think he took the idea from *Carnosaur*. It was probably an original idea with him and he didn't even know that Harry Adam Knight had written a similar story."

Knight is actually the pseudonym of English film journalist John Brosnan (*The Horror People*) who authored or co-authored a series of novels "which are pretty funny," according to Adam Simon, who wrote and directed CARNOSAUR for Corman. "I first encountered them at Dark Carnival, a great bookstore in Berkeley. Apparently, not long after that, Roger was there for a book signing, and they stuck *Carnosaur* in his hands. He read it, liked it and put it aside. When he heard about JURASSIC PARK, I can just picture him at his desk with this enormous light bulb going off over his head—because the beauty of Brosnan's novel is that it did conceive of that idea a good six years before JURASSIC PARK." (Just for the record, neither Brosnan nor Crichton was first to propose the idea. In MUTATIONS [1974], written by Robert D. Weinbach and Edward Mann, geneticist Donald Pleasence lectures his students about the possibility of cloning dinosaurs from fossilized DNA.)

In any case, little of Brosnan's work survived the adaptation to the screen. Noted Simon, "Roger told me, 'I don't care whether you read the novel or not; all I care about is that it has genetically engineered dinosaurs, that it's called CARNOSAUR and that at some point a Tyrannosaurus Rex walks down Main Street.' Eventually, we had to cut the Tyrannosaurus on Main Street for budgetary reasons."

Producer Roger Corman's T-Rex, built full scale by John Carl Buechler, set to stomp into theatres in May, before JURASSIC PARK could open.

Simon did retain one scene from the book, a sequence of teenagers getting killed. Other than that, the film has none of the book's characters, nor even the same creatures. "I set it aside, not because it was bad, but because in many ways it was antithetical to my own philosophy of how to make this kind of story," said Simon. "Brosnan may not agree, but when I read the novel, I saw it as a parody, a riff on B-monsters from the '50s. Its tongue was firmly in cheek, with a knowing wink to the audience. I always felt that the low-budget films that really work are the ones that refuse to do that, whether early Cronenberg or NIGHT OF THE LIVING DEAD."

Simon's approach to CARNOSAUR, with JURASSIC PARK hanging over his head, was to ask himself, "What can we do that they can't do? We could be funnier, though not by being campy. We could be smarter, in some ways, because when you make a $100 million movie, you're making a corporate product that has to please millions of people, so no matter how beautifully you do it, it has to be somewhat debased on the level of ideas. We could be more political than they could be. And we could be grosser.

continued on page 60

Filming Buechler's robotic "waldo" T-Rex as a foreground miniature. Corman's film is based on a novel by John Brosnan, written before Michael Crichton's book.

JURASSIC CLASSIC

O'BRIEN'S "OSO SI-PAPU"

Unfilmed dinosaur epic by KING KONG creator Willis O'Brien looks for a backer.

By Alan Jones

WANTED: A sympathetic producer who can appreciate the potential in bringing Willis O'Brien's last remaining story ideas to the screen as a series of low-budget, quality movies featuring high-class stop-motion animation.

The story begins in 1981. That was the year Steven Archer, assistant animator to Ray Harryhausen on CLASH OF THE TITANS, fulfilled a dream. Through circumstance and contacts, Archer, who also animated the crystal spider in KRULL and the flying dragon in THE NEVER ENDING STORY, met Darlyne O'Brien, the widow of the late Willis O'Brien—the supreme mentor of animators everywhere due to his unmatched model work for the original KING KONG.

"I was a fan," said Archer, who, like Harryhausen and Jim Danforth before him, had been inspired to enter the field because of O'Brien's work. And I was thrilled to talk to her about her husband and actually get a chance to see the original watercolor paintings he drew for a series of projects."

The sketches included storyboards for undeveloped ideas O'Brien had written in the late '50s—THE LAST OF THE OSO SI-PAPU, UMBAH, BABOON—A TALE OF A YETI, THE EAGLE, MATILDA, THE ELEPHANT RUSTLERS and THE WESTERNETTES. "And the thought went through my mind that THE LAST OF THE OSO SI-PAPU still had a lot of potential," said Archer. "So, in 1984 I put the idea to Darlyne that I would search for an interested producer and she sent me Obie's 16-page outline, plus the negatives of his 90 watercolor continuity paintings."

Then in December 1984, Darlyne, who had married O'Brien in 1934, and had coauthored many of his screenplays, was hospitalized and died of cancer. In her will, she bequeathed O'Brien's remaining story ideas to Archer. "It was an incredible surprise," remarked Archer. "After her death, I met an actor—Brad Arrington—who introduced me to scriptwriter Stephen J. Stirling and on his advice I shelved the outline to THE LAST OF THE OSO SI-PAPU and agreed he should write a revised 10-page script under the simpler title THE OSO SI-PAPU."

THE LAST OF THE OSO SI-PAPU was one of the most ambitious projects O'Brien had planned during the latter stages of his life. It was the story of a giant creature, with the body of a grizzly bear and the coloration and skin texture of a gila monster, which appeared once every 100 years. Two of these legendary beasts are discovered in Arizona and two scientists, together with a producer of low-budget films, try to capture one of them. However, one is killed while the other is tranquilized and hijacked by the villainous producer. When the Oso Si-Papu revives it causes untold havoc in an oil field and damage to a cable car system before falling to its death in a canyon. O'Brien put a considerable amount of time and effort into the project, preparing a technical supplement, including many designs and an actual model of the beast itself.

O'Brien's preproduction artwork.

"I would use the same creature design," revealed Archer. "And I'm convinced I could do it cheaply enough to make it a viable financial proposition for any interested parties. THE OSO SI-PAPU has lots of potential for a small company to invest in as it's a promotional dream with the O'Brien/KING KONG hook. Just look at how the Dino DeLaurentiis remake of KING KONG used that publicity angle for all it was worth! I have a VistaVision projector and camera built especially to my specifications which I intend to use to gain the best quality." Archer took the project to two independent producers who roughly estimated it would cost between $3-7 million to make.

The other film properties willed Archer by Darlyne O'Brien, who also bequeathed a 50% interest to her nephew, include the following:

BABOON—A TALE OF A

O'Brien's storyboards for THE LAST OF THE OSO SI-PAPU, the Indian name for a legendary saurian discovered by a movie company at work, filming in Arizona.

A cowboy encounters the Oso SI-Papu, a bear-like beast with a dinosaur hide.

YETI concerns the discoveries of two circus promoters in the Himalayas as they stumble on the 10-foot title creature, a giant cobra, killer whales and a lost city. UMBAH is about a legendary aged Indian who gives his sons a potion allowing them to grow into 20-foot-tall giants. MATILDA is a story of two men stranded on a remote prehistoric island inhabited solely by women—the title refers to a friendly Brontosaurus who helps them escape. THE EAGLE pits a rancher's pet bird against a marauding giant prehistoric lizard. A three-page plot synopsis for THE ELEPHANT RUSTLERS is about a cattleman who goes to India to steal elephants from plantations to sell to zoos, which was scheduled for production in 1960 by Merian C. Cooper and Ernest B. Shoedsack, O'Brien's KING KONG producers. THE WESTERNETTES outlines a BUGSY MALONE-type gimmick picture with cowboy children fighting dinosaurs against small-scale sets.

"I may be naive in relation to the needs of the contemporary cinema marketplace, but surely someone out there must recognize the potential of these projects if only on historic grounds," said Archer. "There was room in the '50s for classy, low-budget exploitation films like THE BLACK SCORPION. And now with video making such an impact, I doubt whether THE OSO SI-PAPU would lose money. I have the equipment, I have seven years of filmmaking experience, I own the property and I'm committed to it 100%. And, although this altruism may go against the grain in today's commercially oriented approach to movies, all I need is someone who agrees with me and is willing to take the gamble." □

British animator Steven Archer owns the rights, a bequest of O' Brien's widow.

"The T-Rex on stage couldn't move," noted designer Rick Carter. "So we moved parts of the set to the T-Rex."

ated, but when you see it attacking, it's full-scale

"But the creature on stage couldn't move to different locations in the set. We had to move different parts of the set around it. It was very elaborate and performed real well, but it was not something that could be wheeled around so we moved the set to the dinosaur. We actually gained a lot of time in what we thought were going to be our toughest sequences, because everything worked so well. I was very involved in the T-Rex attack, shot by shot, because I had to make sure the set was keeping up with what we were going to be shooting, that we weren't shooting things and then trying to reverse and put things back together that could not be done."

A big part of the film's look derived from location shooting in Hawaii. "We couldn't shoot in Costa Rica, because the time was wrong—we would have been trying to build and shoot during the rainy season," said Carter. "We thought of Puerto Rico but Hawaii just has the most mystical, Edenesque sights. We built an exterior of a visitors' center there. In the movie, there aren't a lot of matte shots; in fact, there's only one I can think of. It's like a real wildlife park in East Africa. That was very much Steven's point-of-view. Everything is basically real; it's seen haphazardly as opposed to making a big deal out of it. You come in—and the next thing you know, you're confronting dinosaurs.

Although involved in deciding which of Crichton's dinosaurs would make it to the screen, Carter left the look of the animals mostly to others. "Initially, we had Mark Hallet, John Guchi and some other paleontologists come in and give us some rough ideas for going into certain directions that Steven wanted to see," recalled Carter. "Once Stan [Winston] and his illustrator, 'Crash,' became involved, they really worked that out [with Spielberg].

Carter's design goal for JURASSIC PARK was to make the world of paleontology permeate the movie and make it realistic. "I enjoyed learning about the subject," he said. "I was never a big dinosaur nut while growing up, but I got into it. The joke for me was always that we are clearly the only form of life that has any interest in seeing dinosaurs come back. I'm sure there's a lot of rodents who, if they ever got wind of this idea, would go, 'What the hell are they thinking? Don't they remember what it was like?'" □

Animator Ray Harryhausen's 1969 epic of cowboys and dinosaurs was also based on an unfilmed O'Brien project.

JURASSIC PARK

DENNIS MUREN

ILM's guru of CGI on the brave new effects world.

By Lawrence French

"There's no comparing JURASSIC PARK to what we did on DRAGONSLAYER," proclaimed Dennis Muren, the senior effects supervisor at Lucasfilm's Industrial Light and Magic. Muren presided over ILM's latest quantum leap in computer graphics animation for JURASSIC PARK, providing what promises to be the most realistic dinosaurs ever seen on the screen. "Everyone who's viewed it says they've never seen anything like it," he said.

At ILM Muren has presided over practically every major effects innovation in the last 15 years, and collected seven Academy Awards in the process. Having frequently collaborated with Steven Spielberg (including E.T. and INDIANA JONES AND THE TEMPLE OF DOOM), Muren was contacted by producer Kathy Kennedy before Crichton's book was published. At that stage Muren was asked to help determine how and if the effects work could be accomplished.

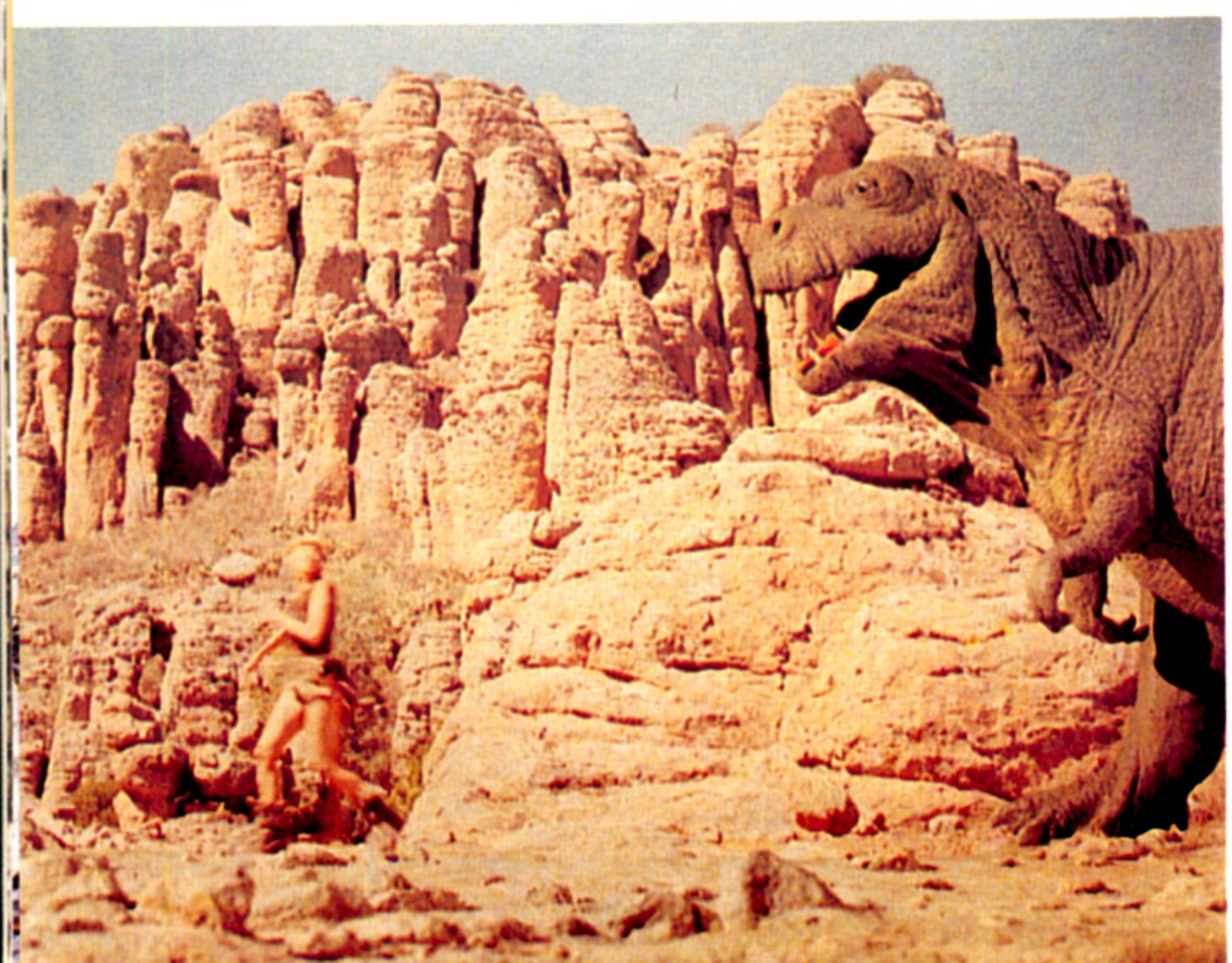
"Steven wanted to do 80% of it with full-size animals," said Muren. "There would be just a few go-motion shots in the beginning and the rest would be mechanical dinosaurs. I had reservations about that, because I had never seen that stuff work very well. Steven had faith though and was hoping that the technology had advanced enough, in the 13 years since the last film to use full-scale dinosaurs (which was BABY). It would be great for a director, because you could have the actors respond to the animals and the cameraman could light them and it would be really interactive. That's something Steven really pushed for at the start."

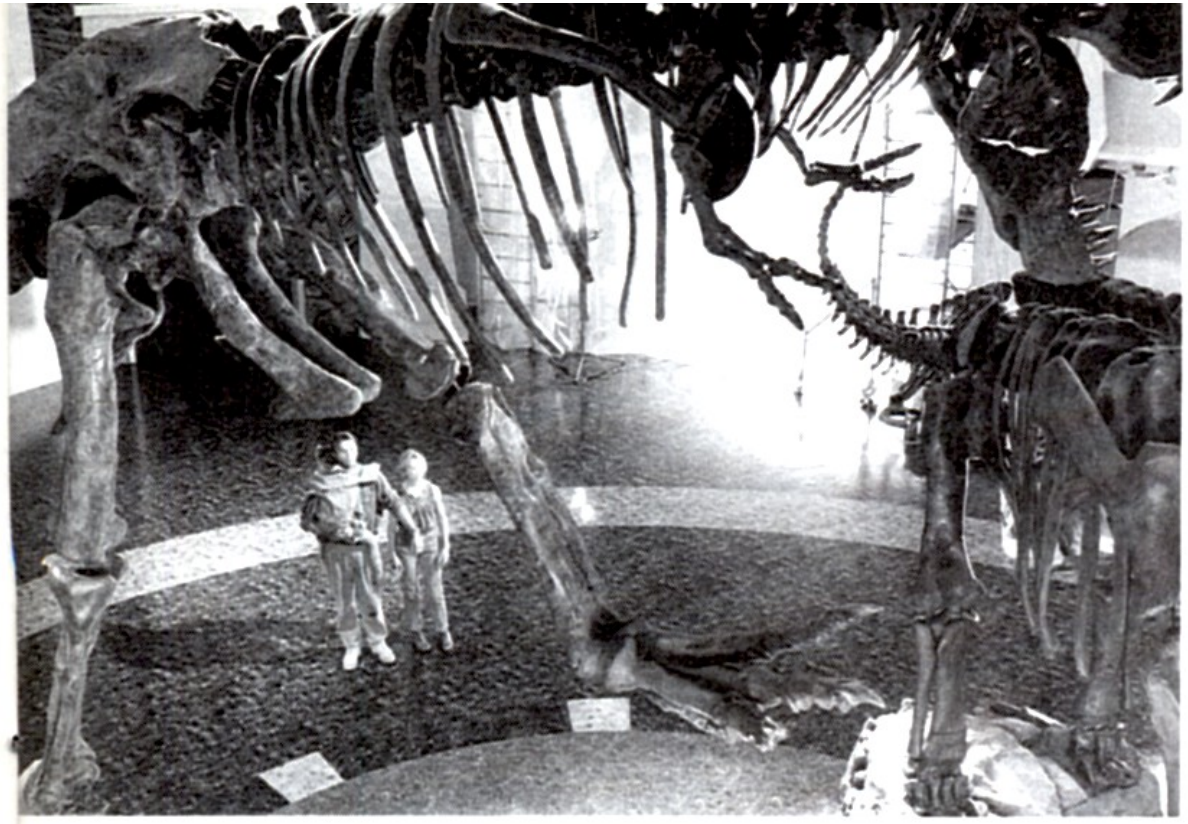
And Spielberg actually began preproduction on JURASSIC PARK on that basis, with ILM on board only to provide the digital compositing. But Muren's test footage of a dinosaur stampede changed Spielberg's mind. "Steven wanted to do a stampede scene with the dinosaurs, but he couldn't figure out how to do it," said Muren. "It would be too expensive with all the models you'd need to build. That got me to thinking about what you could do with computer graphics.

"I started doing research on CG that had been done on dinosaurs and found there wasn't anything that looked close to being real. So I wasn't sure if we could do it, but a lot of the guys here [at ILM] thought we could. I was being very cautious about it, because you have to deliver your shots by a certain date and you can't delay the release just because the effects aren't ready. We tried to determine as specifically as possible how real it had to be, and what was wrong with the things that had been done before."

Muren's research led him to attempt some computer graphics shots of moving dinosaur skeletons using the Gallimimus, a species of slight build similar to Struthiomimus, that

STOP-MOTION DINOSAURS graced Hammer Films followup to Ray Harryhausen's popular ONE MILLION YEARS B.C., animated by Jim Danforth in 1970. More prolific has been the work of Oscar-winning stop-motion expert David Allen, who supervised the comic dinosaurs seen in the 1981 Ringo Starr vehicle CAVEMAN (left and below). ILM's Dennis Muren predicts that stop-motion animators will turn to computer software for future projects.





Sam Neill, Laura Dern and Joseph Mazello, dwarfed by the fossils on display at the park. Muren's CGI tests of moving dinosaur skeletons sold Spielberg on CGI.

stood erect on two hind legs and was about nine feet tall. It was capable of running at high speeds and had a long slender neck. It was a fairly docile dinosaur as it had no teeth or means of defense against larger predators, other than its great speed.

"They were really crude test shots," said Muren. "We just took a couple of backgrounds out of a book, a sort of vista shot, where you saw 15 Gallimimuses running across an African plain. Then we rendered the same scene again, from a different angle, using another background, so we got two shots instead of one. We showed the results to Steven and he just went nuts. So the technology was ready, but we didn't know if we had enough CG animators to do it all.

"There are very few CG animators, but there are lots of great stop-motion animators. Between Phil [Tippett] and Tom St. Amand and Randy Dutra, we had a [stop-motion] team that we knew could deliver. We had a few guys here at ILM we knew could deliver and then we hired some more CG animators and they managed to learn it in the span of four to six months. It worked out really well. So we accommodated everybody. The stop-motion animators created most of the primary motions for the shots with the Velociraptors and the Tyrannosaurus Rex in the main road attack. If we were doing it again, I don't know if we'd need to use stop motion. I think the stop-motion animators could start learning to use the software."

Muren estimated that ILM's computer graphic animators ended up doing over 50% of the CG shots in the film. "It took quite awhile to get things right," said Muren. "We had to get software that allowed us to do performances, so we looked at performance animation systems for inputting data from actors. Some of it payed off and a lot of it didn't. People tend to think you can just scan an image into the computer, push a button and suddenly you have a finished dinosaur. In reality, it's no different than an pencil. If you draw a Brontosaurus, you might have a model in front of you, but you're not going to get it onto the screen unless you do a tremendous amount of work. Stan [Winston] and Phil [Tippett] made some reference models of the dinosaurs that we scanned into the computer, but that only gives you a basic form. It's nothing like a finished animal; it's just a starting place. At least half the animals we did weren't even scanned in. Then Phil told people how the animals should move. It was really important to make them look like living creatures, so the animators took mime classes and studied all sorts of movements to get things right."

"Steven wanted to do 80% of it full size," noted Muren. "I had reservations on using mechanical beasts."

One clear advantage CG has over traditional stop-motion work, is that once your initial model is input, you can replicate it as many times as it's needed. "You don't have to build 15 armatures and animate them all," said Muren, using the stampede as an example. "That's what the initial tests proved, and that's what we've done. It was perfect to get these herd shots." In Crichton's book it's a herd of Hadrosaurs that stampede from the menacing approach of the T-Rex.

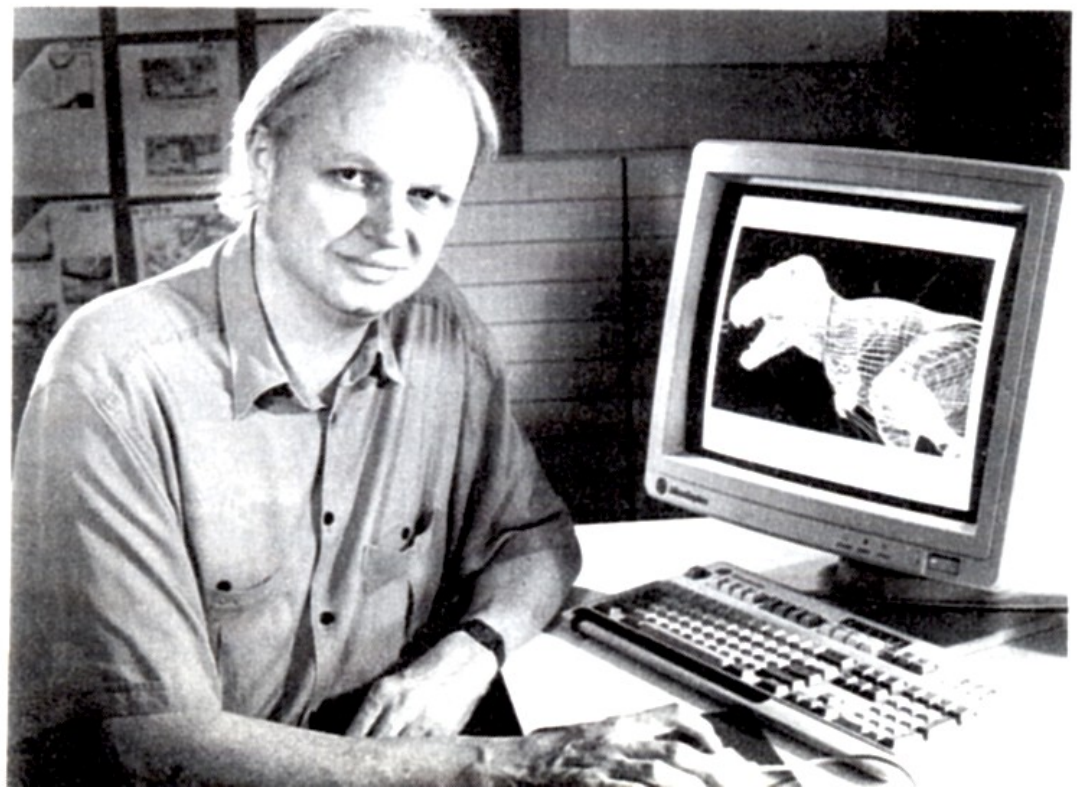
"It's not just replicating them exactly," noted Muren of the CG modeling, "but giving them different skins and colorations, as well as different movements. The results are amazing because they all have the right pantomime and the right motion blur. The skin moves over the bone structure and it's almost like moving matte paintings. You're really creating everything: the lighting, the motion, the form and depth, as well as the animation of it. It's a question of how real is real."

Muren hedged a bit about predicting how ILM's CG work will intercut with Stan Winston's live-action dinosaurs. "I don't know, absolutely," admitted Muren, "but an effort was made to match Stan's shots. The test will be when we see all the sequences put together. Stan has some good material to work with and the best parts of it are in the show. Full-scale dinosaurs work really good for close-ups, but physically the bigger you build something, the harder it is to make it look good. If you build something mechanical that's 10 feet across, it's got a much better chance of working than something that's 20 or 30 feet across. Then to have that animal sustain a performance for eight or ten seconds is very difficult to do, unless you preprogram it. Stan's approach was not to pre-program it. It was all puppeteers. They managed to do a really good job though."

The approach both Muren and Phil Tippett took was to craft shots of some length, rather than the customary effects quick cuts, so you'd be able to observe the movements and behavior of the dinosaurs, just as if you were watching documentary footage. "We've got shots that run 25 seconds," exclaimed Muren. "You see a full-size Brachiosaurus in broad daylight, with people standing in front of it, and the camera dollying along looking at it, as the Brachiosaurus is walking away. That's the kind of thing you just can't do with mechanical creatures in any way."

In order to obtain the optimum results, Muren was on the set during the shooting of any live-action shots that involved ILM effects work. "I'm there to make sure the background

Muren, who has presided over practically every major effects innovation at ILM in the last 15 years, manipulating a digital T-Rex at the computer keyboard.



"The computer is no different than a pencil," said ILM's Muren. "You can't just scan an image and push a button."

Muren collaborated closely with Spielberg, directing Jeff Goldblum and Sam Neill, filming background live-action plates for compositing with ILM's CGI dinosaurs.

plates are shot correctly," explained Muren. "Or if Steven has an idea and wants to try something a little bolder than the storyboards, I make sure we can do it. Conversely, I might have an idea or suggestion that Steven will be open to. There's not a lot of time for thinking too much on the set. You've got to be able to make decisions and move on them right away. You have a shot coming up, you see the set, the actors are there and you want to maximize that moment for the film. You could easily come back with a shot that is only 50% of what it might be, if you only thought about it a little more. So as long as we have the freedom that this type of technology allows, everyone's always pushing to see how much we can get away with. We're able to experiment and the result has been some really bold stuff."

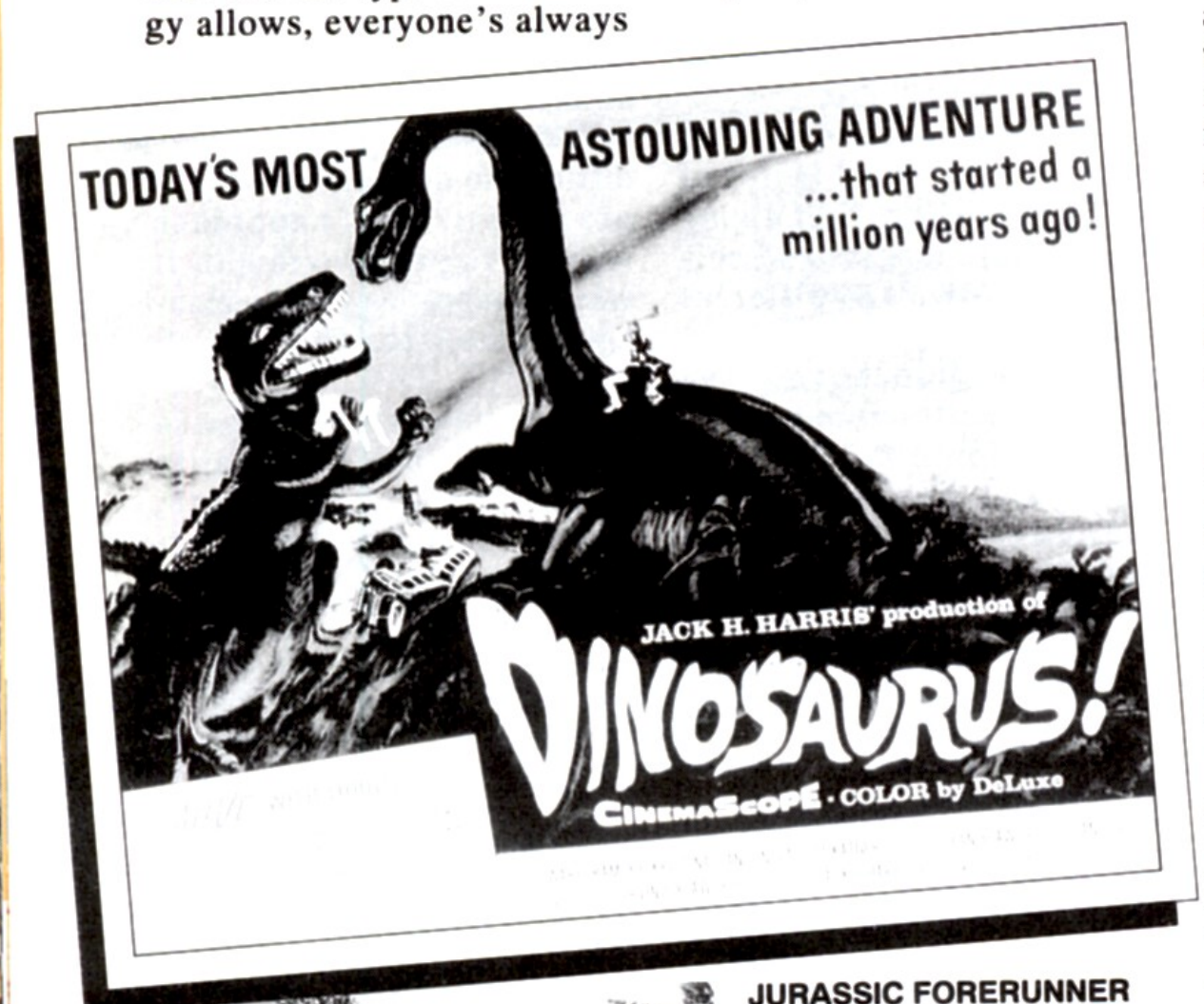
Spielberg edited JURASSIC PARK at the end of last year, timing out the missing effects shots, and left for Poland to begin shooting his next film, SCHINDLER'S LIST. "We were all a little worried about that," admitted Muren. "Steven needed to have snow for that film, so he's over there with [JURASSIC PARK] editor [Michael Kahn] and everything is under control. They have two editing rooms set-up and he sees everything we do. Any changes that come up can be dealt with right away. He's very responsive and if we need his feedback on anything, we hear from him immediately." In fact, ILM beamed Spielberg the footage by satellite, with Muren and executive producer Kathy Kennedy conferencing on the same transmission.

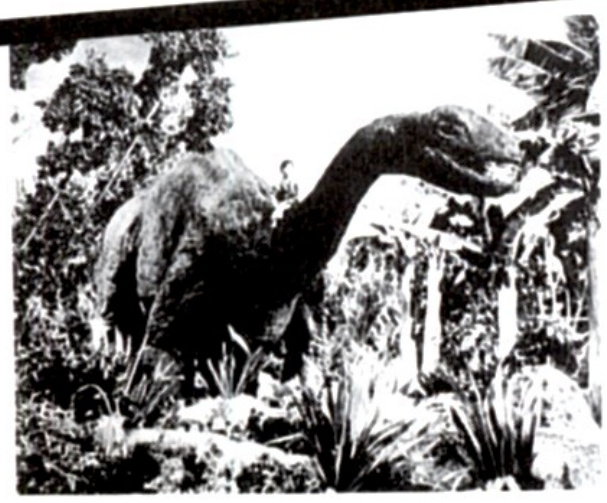
Muren noted how gratifying it has been to work with visionary directors like Spielberg and James Cameron. "We had maxed out with the existing technology about five years ago," said Muren. "One of the things I try to do is create an image that you haven't seen before. You look at it and you instinctively know you're seeing something new, you don't have to be told. Computer technology is quite expensive, but its cost is coming down. We're spending less money on JURASSIC PARK than we did on TERMINATOR 2, yet it's a lot harder than T2. We're more experienced now, so we could do T2, with what we know now, for a lot less money. Anytime you try something for the first time, the cost of figuring out how to do it is enormous."

As Muren approaches his 20th year at ILM, he has no plans for departing, as many former colleagues have done. "I really like it here," he proclaimed. "This is a great place to fulfill your vision. You can maximize your ideas here. A lot of people who have left did it because they liked a specific area—models, matte paintings, or they wanted to make a lot of money. Everyone has different motives. I like to use all the different tools that are available to create an image. If I were to set up a company, I would want to have everything that is ILM, so there would be no point in doing it. What's really important are all the people here. We have terrific visionary folks who know how to use the technology. The technology doesn't mean a thing if you don't have the people who know how to use it." ILM visionaries cited by Muren for their work on JURASSIC PARK include Mark Dippe, assistant visual effects director and Stefan Fangmeier, chief technical director.

As Muren's work reaches new heights of realism, he foresees a greater degree of audience involvement, since there will be fewer flaws to distract an audience's attention. "But it can work both ways," noted Muren. "If you look at BACK TO THE FUTURE II, with all those split-screen shots of Michael J. Fox, there are no mistakes you can see. You just buy it, but you're left without anything to look for. So effects fans may not have as much fun anymore, because they can no longer pick out the faults! I think that's going to happen with JURASSIC PARK."

According to Muren, boss George Lucas hasn't paid a great deal of attention to ILM's JURASSIC PARK breakthrough—yet. Lucas has been busy giving JURASSIC PARK's elaborate sound mix a helping hand, working with the latest developments in state-of-the-art digital technology at Skywalker Sound. "George is out at the ranch, so he hasn't seen our work," said Muren. "But he may come around at some point." □





JURASSIC FORERUNNER
Universal, the producer and distributor of JURASSIC PARK, backed this 1960 effort from producer Jack H. Harris and director Irvin S. Yeaworth, the team that made THE BLOB. Set on an island construction site where dinosaurs have been brought to life by the freak effects of lightning, the film featured stop-motion work by Tim Barr, Wah Chang and Gene Warren, including a 60-ton Brontosaurus tamed by a boy.

JURASSIC PARK

STAN WINSTON

Making full-size dinosaurs that live and breathe.

By Steve Biodrowski

In discussing his live-action dinosaurs in JURASSIC PARK, makeup effects expert Stan Winston referred to Willis O'Brien's KING KONG as "yet to be surpassed." But the praise for O'Brien had an edge. Winston bore the confidence of one who expected his work to be the top dog come June. But dinosaur film fans, who have seen many a live-action dinosaur fall on its face, will need a *lot* of convincing.

"Steven [Spielberg] wanted to do live action as much as possible," said Winston. "He asked how much we could do. I, being a little insane, told him we could do a great deal. He asked, 'How?' My response was, 'I don't know, but since it's something we would love to do, we'll figure out a way.' I think that's pretty much what Steven wanted to hear."

Figuring out a way required revising the script and dropping some sequences, such as when the T-Rex takes to the water. "If we don't feel we can do exactly what's scripted, then it's a matter of going back and adjusting to work within certain parameters," said Winston. "The parameters are not necessarily 'Can you do it?' My gut feeling is that with the magic of the filmmaking process we can do anything, given enough time and money. The question is 'How can we do it within limitations on money and time—how much we'll spend, how much can we get done?' To bring in a movie of this scope for the dollars they spent, we were very frugal. Nothing in excess of $50 million is cheap, but investment equates to return. What you see on the screen will in every way justify the expense of this movie."

Winston noted he faced two major challenges on the film: the artistic challenge of making the dinosaurs look good and the practical challenge of bringing them to life. "Our job was to create the most realistic dinosaurs that anyone has ever seen," said Winston. "We did an enormous amount of research. We maintained a legitimacy to all of the available knowledge when it came to what dinosaurs looked like and how they lived. We had to take that reality and make it as interesting, as dramatic, as beautiful, and as spectacular as you have ever seen." As with men, not all Raptors, for example, are created equal. "Danny DeVito and Arnold Schwarzenegger are both men," noted Winston. "We had to make artistic judgments in the creation of our dinosaurs to make this Raptor or that Tyrannosaurus the neatest one you've ever seen? A lot of that is instinct, not right or wrong."

Makeup effects expert Stan Winston, in charge of JURASSIC PARK's full-scale, live-action dinosaurs, prepares to film the puppet effects of a hatching sequence.

Winston saw the task of bringing the dinosaurs to life his biggest challenge. "They had to act," said Winston. "We couldn't cast a gorgeous actor who couldn't deliver a line, we had to create saurian Robert DeNiros and Jack Nicholsons. That's stretching it, but in the broadest sense of the term, we did need to create characters that performed. I think what we accomplished is beyond anything like this that's been done in motion-picture history. I'm hoping the audience will feel as I do."

The biggest influence on the look of Winston's dinosaurs was the work of artist John Gurche. "I have an enormous amount of respect for the feeling of reality, drama and character in his work," said Winston. "That's what we shot for: that our dinosaurs were as dramatic and beautiful as a Gurche dinosaur." Winston began with a series of pencil renderings by staff artist Mark "Crash" McQuarry. "I'm surrounded, fortunately, in every area—from sketching to painting to sculpting—by an unsurpassed group of artists," said Winston. Once the sketches received approval from Spielberg, fifth-scale miniatures were built, then full-scale sculptures.

"We attacked our sculptures in a much more technically engineered way," said Winston. "Instead of just sculpting freehand, we took our fifth-scale sculptures and sliced them into pies, so to speak, so we had a sculpture put together like the hull of an airplane; then we blew those slices up five times, recreated those hull pieces, and put the armature back together, so that we had an armature that was very close to the finished structure of the character. Then it was a matter of detailing: putting on the skin and doing the final sculpting on an armature that gave us the shape."

At the same time, Winston and his crew were deciding on a variety of methods to bring the dinosaurs to life: cable-actuation, radio-control and computer-governed hydraulics. The most innovative method was

Richard Attenborough, Laura Dern and Sam Neill react to the effects magic.

"Spielberg asked how much we could do live," recalled Winston. "I, being insane, told him we could do a lot."

Spielberg gets advice from Attenborough, the Oscar-winning director of GHANDI.

strapping the top half of the T-Rex to an airplane flight simulator. "That concept came from Craig Katon, one of my key mechanical coordinators," said Winston. "It limited a certain amount of shooting ability, because for many of the shots we would only be able to shoot the T-Rex from the waist up, but it seemed like a perfect way to do the broad moves—it's a tried-and-true method of taking a lot of weight and giving it a mutli-axis." Winston's crew also built an insert head, hoisted by a 13,000 lb. crane, and insert legs.

For the Tyrannosaur's more complex movements, Winston developed an idea "that came to me in the middle of the night: a performance-capturing Waldo. It was always a concern how we were going to puppet this enormous guy. We did have some people with us whose background was amusement park-size creatures like King Kong. The conventional method was, on a slide-pot board, to log in the actions of the hydraulic character, motion by motion; then, once that action is created, the computer memorizes it, and you can play it back over and over again. But it takes a long time to program that action and we needed to be able to take direction on a set. So I came up with the idea of recreating the dinosaurs' inner structure mechanically—which we had already done in mock-up—so that we knew how everything would move. For every joint or axis of motion, we placed a linear potentiometer—which is a slide-pot, so to speak, that looks like a little piston. If we could get those little pistons to match the movements of the hydraulics, then instead of putting them on a control board, we could put them in place of where the hydraulics would be in the full-size character. This gave us a small version of the insides of the big version, so that any movement we gave to the small T-Rex as a puppet—holding onto it as a puppeteer and moving the head—would go right into the dinosaur, and he would do what we wanted, in real time. It worked beautifully."

The film's Triceratops and Bilophosaurs (a poison-spitting species) were filmed totally live using Winston's creations. For the Brachiosaur, Winston's team built only the head and neck. For the Raptors, Winston's crew employed a variety of rod puppets, cable and radio-control versions, as well as the conventional man-in-a-suit approach. Fuller shots of the T-Rex, Brachiosaur and Raptors were augmented with ILM's CGI work. Winston said matching his dinosaurs to the computer-generated versions of ILM was not one of his concerns. "It didn't influence the design at all," he stated. "They took exactly what we designed here and duplicated it. Phil Tippett was a major influence. I think that a great deal of any continuity that we have between live-action and computer-generated is greatly due to Phil and his helping us create as realistic dinosaur motions as we could. Phil's a dinosaur himself."

The only dinosaur to visit the Hawaii location was the Triceratops, for a scene where the creature is found lying ill. That left the majority of dinosaur effects to be filmed on stage, under the supervision of Michael Lantieri. "Michael worked very closely with us," said Winston. "We had certain requirements from a floor effects standpoint, a crane, for instance, to operate characters externally. We knew what we needed from his team and how any physical apparatus, interior or exterior, would marry. It was a perfectly coordinated marriage of teams.

"I would say that about the whole movie," Winston continued. "It was the most perfectly coordinated movie I've ever worked on, from set design, art direction, floor effects to creature effects. Every aspect of this film was a team effort, helmed by a director I had an enormous amount of respect for, even though I had never worked with him. Now, having worked with him, I know that it is no accident that Steven Spielberg is Steven Spielberg. He's an incredible director, and he has an amazing feel for film. This *could* have been the worst working experience of my life, because it was the biggest. It turned out to be the opposite. It was a joy to go to work every day. It was the best working experience I've ever had, with the exception of directing my own movies." □

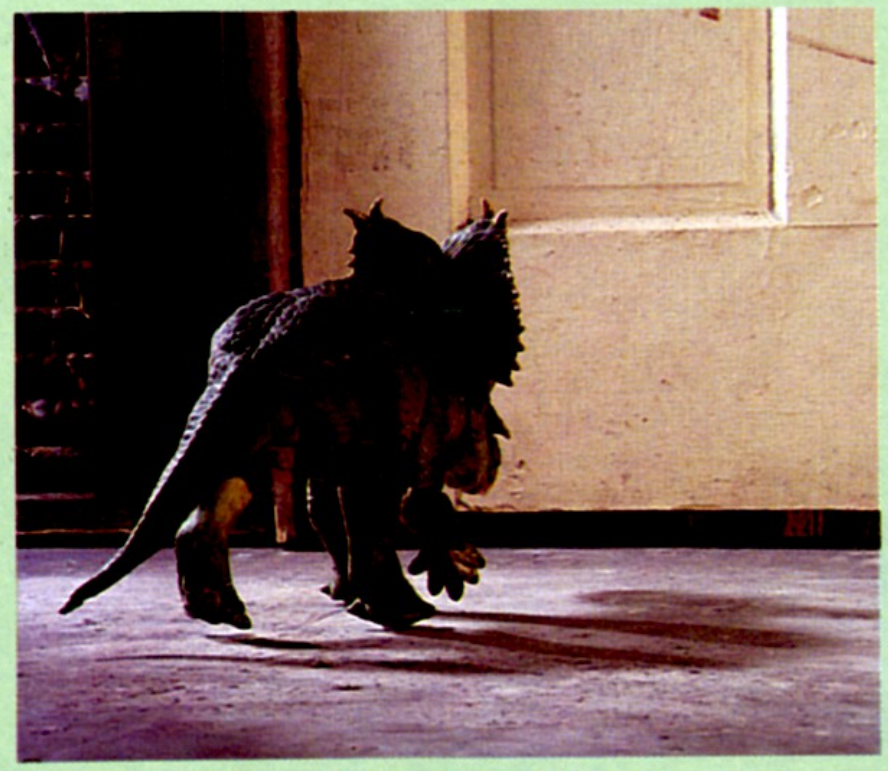
MADE IN JAPAN by director Inoshiro Honda in 1954, inspired by Ray Harryhausen's BEAST FROM 20,000 FATHOMS the year before, Toho studio's rampaging dinosaur is due for a big-budget remake by Columbia Pictures, scheduled for release at Christmas 1994. Like Steven Spielberg's JURASSIC PARK another example of how the B-film subject matter of the past gets recycled as the A-projects of today with top Hollywood stars and the best production values.

JURASSIC WANNABE

PREHYSTERIA

Cute and cuddly dinosaurs out-Spielberg Spielberg.

By Chuck Crisafulli



Effects by David Allen Productions. Left: Hidden away by kids, a stop-motion Chasmosaur attempts to butt its way through the basement door. Right: David Grossberg manipulates the head with wires for a walking shot rod-puppeteered from beneath.

JURASSIC PARK may be the Brontosaurus of dinosaur films, but the prehistoric creatures currently have starring roles in Moonbeam Entertainment's smaller scale PREHYSTERIA, directed by Albert and Charles Band. The direct-to-video effort centers on the whimsical misadventures of five miniature dinosaurs that inadvertently hatch from ancient, sacred eggs and incite mayhem in the hearthy farmhouse of a modern, American family. The creatures are more cuddly than beastly and eventually work their way through a suitably upbeat ending. While the script by Pete Von Sholly has more than a few wooly mammoth-sized holes in it, the tiny dinos are a stand-out attraction, thanks to the work of skilled stop-motion artist David Allen.

Although Allen only did a few scenes worth of the kind of stop-motion animation his reputation is built on, he served as the film's visual effects supervisor and was responsible for all the dinosaur effects. The script called for a Brachiosaurus, a Chasmosaurus, a Stegosaurus, a Tyrannosaurus, and a flying Pterodactyl. All five creatures were brought to life through a combination of cable-activated puppets, radio-activated puppets and blue screen work, as well as the stop motion. "The majority of dinosaur movement was live-action, cable-activated puppetry on the set either with the actors or the creatures by themselves," explained Allen. "Our chief concern was getting a believable blend of all three."

For Allen, like JURASSIC PARK's animator Phil Tippett, dinosaurs are a passion. "It's a childhood interest," said Allen. "I was always fascinated by dinosaurs when I was little. I loved looking at picture books and encyclopedia illustrations. It goes back to the first time I saw KING KONG as a kid. That movie turned my whole life around."

Allen's dinosaurs have an innocent, fanciful charm to them, and he said it doesn't bother him that his PREHYSTERIA creatures may not mesh with pre-historic reality. "As you get into your work, you get less interested in photographic reality and more interested in something expressive. The object isn't to be exactly like nature, but to say something more. I've just always tried to animate as carefully as I can, hoping that the end result will be believable on its own terms."

That's probably more than can be said of the film's story. "There were a lot of script problems that never got solved," Allen admitted. "But I think the dinosaurs are very effective. We had some very sophisticated cable systems, and some excellent puppet work. I just wish that there were more of the dinosaurs in the movie.

continued on page 60

Allen created five diminutive dinosaurs for the Charles Band direct-to-video release. Left: Chis Endicott animates a stop-motion Tyrannosaurus for a scene where it plays with a boy in the kitchen. Right: A cable-activated puppet in the greenhouse.

DINOSAURS ATTACK!

continued from page 15

campy Saturday morning cartoon and they decided to go that route with the feature. So now the character I 'played' in the cards very closely resembles the scientist in MYSTERY SCIENCE THEATRE—he's goofy, and he has an assistant he keeps hitting on the head. It's the Jay Ward approach to DINOSAURS ATTACK!, I suppose; putting it less flatteringly, it's the Bill Dozier approach!

"I think they're waiting for JURASSIC PARK to hit big. Then they can come in with what will be seen as a parody of that. I see their logic, because with all these dinosaur movies, a parody will be inevitable. If it were up to me, it would be a feature-length animated film for the Fox Network, with the same team that's doing BATMAN. Of course, you'd have to cut down on the gore..." □

CARNOSAUR

continued from page 23

There are some truly horrifying things in our film that would be disturbing to little kids and perhaps to adults, too."

According to John Carl Buechler, who provided the film's creatures and carnage, "Roger stressed that he wanted to go for an NC-17, at least for one version of the film, so there is no sparing the amount of viscera we were asked to provide."

Buechler used in-camera effects to combine his dinosaurs with the actors: full-scale versions, men in suits and puppets shot with forced perspective. "This ain't like a Harryhausen movie—I loved them, but they were family-oriented," said Buechler. "The approach here is more like ALIENS. How many seconds do you see the Queen Alien on screen for any specific cut? This movie is structured like a dark horror film; consequently, when we designed the creatures, our approach was to make them look great for a few seconds, as opposed to mediocre for a long, boring shot." □

PREHYSTERIA

continued from page 31

They're a source of wonder, but they don't really effect much of what happens. The story could almost be about five puppy dogs." Allen laughed.

"Directors are always talking about how their pictures are not about special effects; how they have a new story to tell. But, invariably, when the picture comes out, the only thing that keeps it interesting *are* the special effects. They're the oasis in the desert." □