Millennial Imaginings

Visual-effects visionaries take us further than we could have imagined.

By | Joe Fordham

Three films stand shoulder to shoulder, nominated by the Academy of Motion Picture Arts and Sciences as Oscar contenders for Best Achievement in Visual Effects. The films have little in common: a gritty Roman epic, a visceral horror vehicle and an oceangoing drama. Add the four other titles that complete the seven films selected for the academy's third annual visual-effects bake-off, and the selection becomes even more diverse.

What makes these films exceptional? Viewed side by side, "Cast Away" and "The Perfect Storm" allow for the comparison of synthetic oceans put to very different stylistic uses. Likewise, "Dinosaur" and "How the Grinch Stole Christmas" become bedfellows with "Hollow Man" as examples of artificial characters — whether it be huge and craggy, green and hairy or raw and bloody — wrought to different purposes. Let's not forget the denizens of "X-Men" who set down their stakes beside glorious Rome in "Gladiator," the Seussian sweep of the "Grinch" and the primordial realm of "Dinosaur." The prevalence of physical mechanical effects as vertebrae to digital illusions also stands out as a theme, as does the narrative role of the effects on display.

Whether Maximus, the storm or the agonies of Sebastian Caine are selected for their technical and artistic merits at the 73rd Annual Academy Awards, the implications are clear. Visual effects today are continuing to play a more prominent role than ever before in the filmmaker's arsenal of tools, laying down the gauntlet for these artisans to take audiences further than they have travelled before.

Reviewing the year's official contenders, artisans associated with each project took the time to address their work and cast an eye toward the implications for the state of the art of visual effects in 2001.

■ CAST AWAY

You may have missed the visual effects of Twentieth Century Fox and DreamWorks' "Cast Away" even if you saw the film. "What I think is interesting about this film is that there are 55 minutes of visual effects, most of which occur after the plane crash," says visual-effects supervisor Ken Ralston, a five-time Oscar winner ("Forrest Gump," "Who Framed Roger Rabbit") and president of Sony Pictures Imageworks, when considering his seventh collaboration with film director Robert Zemeckis. Ralston is referring to the harrowing, pivotal sequence that instigates FedEx employee Chuck Noland's (Tom Hanks) desert island adventure.

"Everything outside the windows before the crash — cloud effects, lightning and water effects — was all computer generated. For the crash, we shot Tom in a lot of scenes and blasted the plane with water later. [Then we] combined those elements so it looked like he was right in the middle of all the mayhem. You don't want to hurt your big-time actor — at least not at the start of filming!"

Digital effects, miniatures and physical effects by Ken Pepiot and John Frazier sent the plane to a watery grave and stranded Hanks on his island, filmed in Monuriki, Fiji. Further digital magic removed neighboring landmasses, added a treacherous reef and, for one spectacular 360-degree pan, altered rock formations and added a high tide that lapped around Hank's feet, emphasizing his isolation. When the rugged terrain made it impossible to import a camera crane for a vertiginous mountaintop overview of the island, Ralston shot the scene in a parking lot in Malibu. "We had Tom struggling up a plaster centerpiece, the camera peering out at trucks parked all around, with grips eating doughnuts and the Pacific Coast Highway in the background," Ralston says. "The cliff
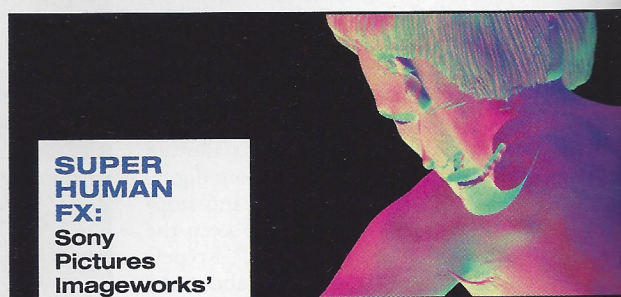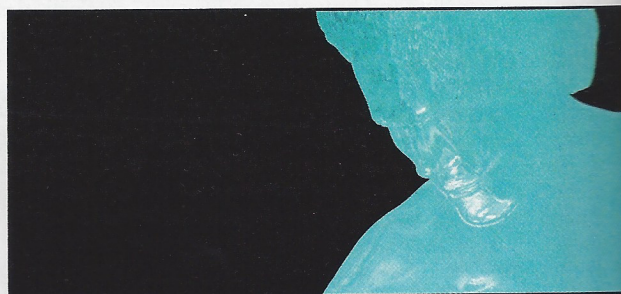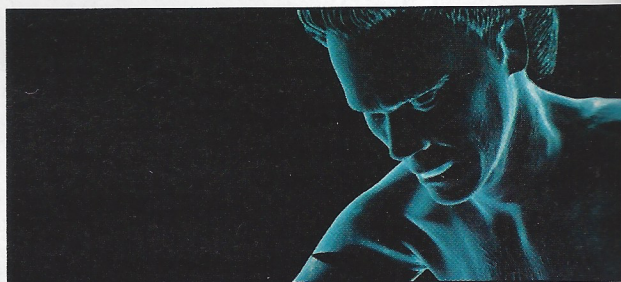
SUPER HUMAN FX: Sony Pictures Imageworks' Scott E. Anderson and Tippett Studios' Craig Hayes provided the intricately rendered CG work in "Hollow Man."

ON THE COVER: The mighty Kong looms over his Hollywood handlers, headed by Italian effects expert Carlo Rambaldi, during the shooting of "King Kong" (1976). Although impressive, the towering robot was largely ineffective, forcing the production to lean heavily upon the talents of nascent American makeup maestro Rick Baker, whose "backup" ape suit was impeccable — as was his performance in it.

face, where the camera looks down into waves crashing into rocks, was a digital matte painting with computer-graphic water and the reef and sky added in."

Also featured in the mix were surreal moonlit scenes filmed day for night, a transition that leaps four years via dreamlike light effects and a digital fish, composite trickery that enabled Hanks to navigate a nonexistent reef and a CG whale. "We used a tremendous variety of digital-effects tricks," Ralston says. "They were all interwoven into what's most important — the story. We were just helping the director tell that story as close to his original vision as possible, with great subtlety and nuance."

■ DINOSAUR

Walt Disney's "Dinosaur" tells the tale of Aladar, an orphaned iguanodon (voiced by D. B. Sweeney) searching for a home after a prehistoric cataclysm. Visual-effects supervisor Neil Krepela, a two-time Oscar-nominee ("Cliffhanger," "2010"), guided the four-year design and production process for the film, orchestrating a live-action shoot that gathered photographic backgrounds, incorporating footage shot with a wire-flown "dinocam." Krepela shepherded the talents of hundreds of digital artists and technicians who digitally reconstructed a prehistoric world from the location photography, combined it with miniature elements and brought it to life with computer-animated characters at Disney's visual-effects department, the Secret Lab.

"'Dinosaur' doesn't rely on any one technique," Krepela says. "It has character animation that is treated in a very realistic way. It has heavily treated live-action backgrounds, which we sometimes treated as a character. It has miniatures, water and fur. But I think what really makes it unique is, quite simply, that never before has anything been done to this magnitude. Every shot is an effects shot. We had 40 different species and hundreds of characters populating this world. I think it represents a very new and valid way of telling a story with cinema."

Technologically, "Dinosaur" was built from the ground up, a process that allowed Krepela and his team to create custom digital animation tools for traditional cel and stop-motion animators. "We wanted to keep the artists' work in an artistic realm," Krepela says. "They didn't have to think about the 1.1 million hairs on our lemur characters or all the muscles involved in the modeling nightmares that went into those characters in order to animate them. We created some pretty facile levers and lighting tools, which I think really helped make the picture shine."

But, for Krepela, the ultimate touchstone for the film — essentially a fairy tale with redwood-sized talking protagonists — was its quest for visual realism. "We had to make our characters realistic to make them fit into the real backgrounds," Krepela says. "When

you're looking at something that's very real, you get sucked in a little deeper, and you have to suspend a little less disbelief. The more real you can make it, the more poignant it becomes."

■ HOW THE GRINCH STOLE CHRISTMAS

A common sentiment expressed by crew on Universal Pictures' live-action adaptation of Theodore Geisel's children's book "How the Grinch Stole Christmas" was how huge the Whoville set appeared on screen. As visual-effects supervisor Kevin Mack explains, the illusion was created by the simple fact that the "set," as created in Digital Domain's virtual realm, covered an area of 100 square miles, including Whoville, a curlicued Mount Crumpit, forests of Whovian conifers and an alpine landscape beneath a 360-degree sky.

"Because of the faith of the producers, we were integrated in the production process early on, which allowed us to develop a really ambitious methodology for creating the Whovian world," Mack says. "Everything in that world had to be fabricated. This was such a huge task that production designer Michael Corenblith let us take on the task of designing everything beyond." By backing the studio set with bluescreen material, Mack's team enabled cinematographer Don Peterman to line his camera up with the digital buildings and mountains, made visible on stage by video playback.

The overlap continued to character creation, with Digital Domain supplying hundreds of digital Whos, featured alongside the work of costume designer Rita Ryack and makeup-effects designer Rick Baker. "We devised a 'Who construction kit,'" Mack says. "This was a software application that allowed us to take a
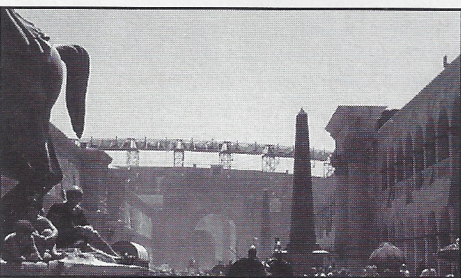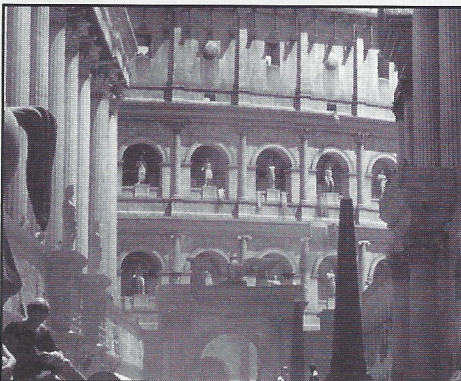
GLORIOUS GLADIATOR:
John Nelson and artists at Mill Film studied the structure of the Roman Colosseum down to the porous silicate bricks that form its core.

generic Who, already set up for animation, our animation supervisor Randall Rosa, and had a set of 'sliders' that controlled every aspect of that Who's appearance. We could dial up the size and placement of their eyes, their type of nose, make them tall and thin or short and... We could even make them age, making the... sag and wrinkle. Then we had a whole library of clothing and textures that would automatically scale to fit the proportions of the character. It was very efficient."

From the opening title sequence — a Matte concept that revealed the geography of Whoville inside a snowflake — through to the creation of more than 600 visual effects designed from start to finish in the computer, "Grinch" set a new benchmark for Digital Domain. "There have been huge effects shows before," Mack says, "but we have never had a project where such a high percentage of our shots have been so ambitious and were 100% computer generated. It was really an incredible opportunity for visual effects."

■ GLADIATOR

When Universal and DreamWorks placed their first teaser trailer for director Ridley Scott's Roman Empire epic "Gladiator" during Super Bowl 2000, they knew what they were doing. Scott paid off the tease by filling his film with giant battle vistas, thrusting the audience close-up into bloody conflicts and occasionally pulling back to drift slowly over the Roman Colosseum at the heart of his film, taking in the sweep of Rome and fleet of the angry mob. This was spectacle for the masses, told on a grand scale, and audiences responded to the stirring tale of Gen. Maximus Decimus Meridius caught up as a pawn in the political machinery of Rome.

"A film director today can move or place the camera wherever they want to tell a story with film," says John Nelson, visual-effects supervisor for "Gladiator." "When you put that technology in the hands of a master filmmaker like Ridley Scott, you're going to get some pretty dynamic, immersive imagery. We were able to provide a level of realism showing subtleties of light reflected on the sand in this big stadium, while at the same time, we were able to take the camera off its tripod covering the gladiators as they entered the arena with a 26 second Steadicam shot, as if it were really happening. I think that's why the film has spoken to people on a very emotional level. The effects provided an appropriate stage for the story to play out on."

Robin Shenfield, director of Mill Film, the London-based visual-effects house that provided the visual effects for the film, has similar praise for the director's vision. "Ridley and all the other departments — from Arthur Max's big physical sets in Malta to John Mathieson's live-action photography and Pietro Scalia's editing — really made our work integrate so seamlessly into the film by making the context so strong. Visual effects are used to being the slightly unwelcome guests in the production process, but I think that because Ridley and his team embraced our involvement, he really pushed us in his very low-tech way — sitting there with the artists and sending us drawings

— to create more believable effects. Of course, we're incredibly chuffed to be the only European effects house at the academy bake-off."

For Nelson, the most important aspect of the international production — which incorporated the talents of British, French, German, Italian and American crew members — has been that it has set an example for the potential use of visual effects. "Hopefully, filmmakers will look at 'Gladiator' and realize that we can go places we've never been before and show things we've never seen before. But we still need to have good stories and have good characters to do that. It's not just visual effects for visual effects' sake. It's visual effects — and some pretty good ones — in the service of a good story.

■ HOLLOW MAN

With nothing left of him but a sinewy rack of man-shaped meat, doctor Sebastian Caine (Kevin Bacon) collapses to the floor with a splat, leaving his horrified co-workers no choice but to grapple with his convulsing body and heave him onto the examination table. As fascinating as they are repellent, the layer by layer invisibility transformations of director Paul Verhoeven's Columbia Pictures horror thriller "Hollow Man" became the focus of Scott E. Anderson's team at Sony Pictures Imageworks. Digital supervisor Scott Stokdyk was not only the person in charge of the digital pipeline at Imageworks, he was also responsible for keeping Anderson in touch with the technical progress and capabilities of the team. Given the complexities of the project, Stokdyk's role was critical to the production.

"No one has attempted a transformation of this complexity before because the vast amounts of data needed to represent the amount of pieces of the human body has made it prohibitive," Stokdyk relates. "A lot of the old tricks that we typically used to manage complex imaging no longer worked for us." Thousands of digital surfaces were modeled and animated in the Imageworks computers using shading and rendering procedures that are now being applied to streamline future projects. But the ultimate result of the achievement was a unique translation of Bacon's performance. "We were removing another layer of limitations," Stokdyk says. "We were retaining a human performance through an extremely complex animation process."

Craig Hayes, visual-effects supervisor at Tippett Studios, who generated Bacon's less visceral but no less menacing invisibility manifestations, concurs. "One of the outstanding aspects of this film," Hayes says, "is that once the leading man becomes invisible — about one-third of the way into the picture — you never see him again. Every manifestation was created with a digital double — yet it is unmistakably Kevin Bacon's performance, because the animation was heavily based on the actor's own performance." By encasing Bacon in black-, blue- and green-screen material —

integrated with Stan Parks' physical effects and Amalgamated Dynamics' prosthetic effects — Tippett Studios enabled Bacon's personality to read through water, smoke, rain, blood, steam and fire. "It was an opportunity to allow a performer to move beyond their own physical performance," Hayes says. "We were bringing a character into an entirely different medium."

■ THE PERFECT STORM

Industrial Light & Magic (ILM) visual-effects supervisor Stefen Fangmeier has made a name for himself taming nature. Prior to his work on Warner Bros.' high-seas drama "The Perfect Storm," he generated the digital tornadoes of "Twister" in 1997 and has played key roles in many of ILM's breakthrough CG
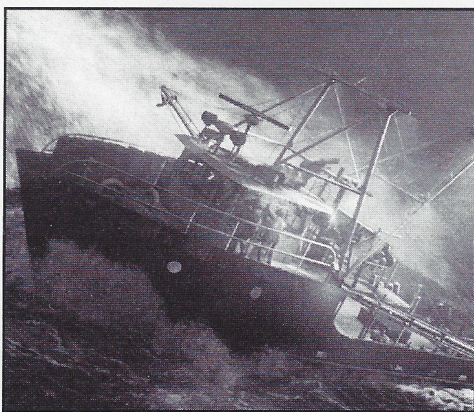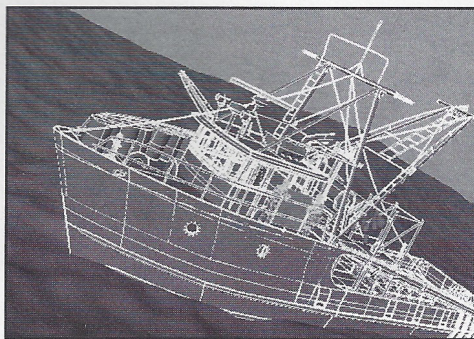
PARTICLE PARAGON:
ILM's Stefen Fangmeier raised computer-generated organic effects to a new level with "The Perfect Storm."

projects, including "Terminator 2: Judgment Day" and "Jurassic Park."

"Reality is the absolute mantra," Fangmeier says, "but creating visual effects of a realistic phenomena and giving it a dramatic and cinematic performance requires a very intense creative, artistic process to make that effect look right on-screen. Most people have stood on a shoreline and watched waves breaking over rocks, so modeling those effects has to hold up to quite a standard. 'The Perfect Storm' has been the most challenging project in my career so far because of the complexities involved in portraying those kind of natural occurrences."

By combining John Frazier's physical effects — actors pummeled by truckloads of water on Warner Bros. soundstages — with blue-screen composites, Fangmeier's crew generated heaving ocean swells, hurricane-eye

views and frequently 100% digital views of the roiling tempest. Integrated with photo-realistic digital ships, aircraft and digital performers, fluid dynamic simulations and particle animation CG enabled CG to venture into aquatic realms where CG had feared to go before.

"This film probably could not have had been attempted five years ago," Fangmeier says. "Technology wasn't there, and it could not have been done to the level that the subject required. It's really opened up whole new possibilities for filmmakers to now deal with the water. Filming out on the water has always been extremely costly and time-consuming, even in benign weather conditions. In that sense, 'The Perfect Storm' represents an advance in industry standards similar to 'Jurassic Park.' We've developed tools and visual techniques that have created a way for filmmakers to take on a whole new subject in future films."

■ X-MEN

Professor Xavier, Wolverine, Jean Grey, Cyclops, Storm, Rogue vs. Magneto, Sabretooth, Mystique and Toad were 10 characters with 10 peculiar physical traits — ingrown metal claws, laser-beam eyes, shape-shifting abilities, psychokinetic powers. Not all the "mutations" were instantly apparent, but each followed individual character arcs as they evolved and learned to co-exist throughout Twentieth Century Fox's Marvel comic-book adaptation, "X-Men." Balancing characters' subtlety and scope became the main concerns for visual-effects supervisor Mike Fink ("Braveheart," "Batman Returns").

"This is the first film in the 24 years I've been working in visual effects where the visual effects were not just there to help tell the story," Fink says. "Story is always very important, but this time the effects were there to help establish the characters. I think that the film was well liked because the characters were not cartoon cutouts. A lot of that came from developing effects that worked consistently with the characters, making sure to not go too far in any one direction, keeping things consistent and letting them grow as they progressed throughout the movie."

A battery of visual-effects houses — including Cinesite, Digital Domain, Hammerhead, Kleiser-Walczak, C.O.R.E. Digital Pictures and POP — supplied illusions for the film, a factor as endemic to the structure of the booming effects industry as it was to the ensemble nature of the story. "The workload was so huge," Fink says, "that we first broke up effects by personality. Then I literally made intellectual artistic choices as to which group I thought could do the best with which person's powers." Blending Gordon Smith's makeup effects and Colin Chilvers' physical effects, six facilities created the majority of the effects, with six more handling composite fixes, digital matte paintings, miniatures, optical effects and wire removals for superhuman feats and furnishings. "I used to think of visual effects as improvisations around the structure of a story," Fink says. "It's no longer a question of keeping your structure and doing variations based on that. We're now creating whole new structural changes in the story." ❑