11. Movie F/X: Making Heads Roll

A jump cut can be a special effect, particularly if it shocks the audience, as in *Psycho*, or Godard's *Breathless*. However, this shock will vary immensely from one year to the next. In 1895, the head of a dummy rolling off the axman's block was enough to be called a shocker, that of Victorian expression—in Edison's peep show *Mary Queen of Scots*.[1] The director, Alfred Clark, stopped the camera before the ax fell, told the players to stand still, then replaced the actress with a dummy This famous anecdote has been called the first "known example" of special effects in cinema.[2] The trick became familiar enough to be given a name, "arret—the stop—" by the *Philadelphia Public Ledger*. It has been called an "elementary device … as basic to the future of visual effects as the invention of the wheel was to industrial development."[3]

According to legend, a few months later, Georges Méliès accidentally came upon the same device.[4] His camera crank broke down for a moment, leaving a gap. On film, an omnibus on Place de l'Opera seemed to transform into a hearse, and a man into a woman.[5] The "substitution shot" was put in the hands of a master who would employ it in hundreds of films. The Robert-Houdin Theater that Mies retooled has become legendary. He installed trap doors, smoke machines—all the accoutrements of a magic act or a variety theater and converted these into dissolves, apparitions, disappearances, metamorphoses. As art direction, he drew literally upon the *fantaissistes*, illustrations from earlier in the century by Doré, Grandville, and others. He would become the Baron Munchhausen of cinema. And yet, by 1912, he was considered a has-been.

The encyclopedic newsreel short, the *actualités* and *nouveautés*, dominated many theaters for a few years, until finally the longer form, feature-length melodrama, became the stock-in-trade at movie theaters (essentially after 1915). Within these market shifts, the codes of reception, as in special effects, were not stable. And the gadgets used for effects, the mirrors and cranks and mattes, tell us very little in themselves about what the audience saw in their

mind's eye. The most convincing model for me is Thomas Gunning's "cinema of attractions"— "the shock of cinema in an exaggerated form," a "cinema of instants."[6]

Myths About Walking

Paris 1907: Theater lets out. An hour of novelty and trick films had been playing. They were shot on streets nearby. The audience leaves to wander the same streets. The movie version interferes ironically. How indeed do these tricks compare to the scripting of real streets and spaces? I am convinced that, for the most part, cinema erases the city, on behalf of Artifice. But to explain, I need to clear away a few myths. First of all, the term *spectacle* is a little too broad. It misses subtleties that went into special effects in 1895 (and for that matter, 2003). The cities where film began from 1895 to 1910—especially Paris, London, New York—were *not* dominated by spectacle, despite the world's fairs, the freak shows of all kinds, the morgue shows, the ghoulish and carnivalesque frills.

These cities were screaming fish markets, dominated more by rush hours than spectacle, by massive real estate expansion, by new trolley systems, what film historian Ben Singer called "hyperstimulation."[7] They were very densely packed, the infrastructure on the streets severely overlapped. What's more, the entertainment culture of 1870 was dying off as much as it was emerging: the number of panoramas and magic lantern shows did indeed die off by 1900. Then by 1920, the dime museums, the circuses, vaudevilles, and upscale restaurants were suffering, though in varying degree, from one city to the next.

If anything, movie special effects were recreating the urban composite—the nerve-jangling psychopathology of streets layered with vendors, with classes bumping shoulders, even with violent class warfare directly on the streets. They were Baroque illusion responding to the jittery implosion that was the metropolitan city. The movie shock is very different than the panorama. Instead of harmonizing the machine-as-nature, they turned the city of circulation awry. They suggested a world where the straight path is occluded by massive political and economic tensions, by the whiff of disaster to come. They tended toward allegories about urban memento mori (intimations of mortality inside the imploded city). They scripted the flash that seemed to many the flash of anger in an emerging chaos, as classes mixed more than they had, and the economies veered toward war.

This emerging chaos was faked through *composites*. That is an essential place to start. Movie "shocks" from 1895 to 2003 have relied on this complex tool most of all: *Then and now, special effects are fundamentally the art of compositing. They are layers superimposed in space, or in time*. By *space* I mean matte backgrounds; by *time* I mean substitutions. These composites also split the screen, inserted miniatures, mattes, moving mattes, glass shots, use double-exposure, dissolves, fades, masks in velvet.

Most of these compositing effects evolved out of the trick films at the turn of the century, Méliès in particular. They were music hall *phantasmagoria* mixed with trick photography. They also were deeply linked to print culture: they brought popular wood engravings to life, into palpable space. Méliès was part of a bumper crop of producer/filmmakers who specialized in novelty films from 1896 to 1910, but literally "drew" heavily from tricks in print or the music hall: Stuart Blackton's Vitagraph in the U.S. (i.e., films on "liquid electricity"); Pathé in France; Robert W. Paul[8] in England.

Dozens of trick-film companies flourished by 1905. Their very abbreviated films look like frantic seances today. Electricity itself—and X rays, invented at the same time as cinema—suggested a new Baroque Magick Science, along with fantasy illustrations of video telephones.[9] Skeletons leaped through the smoke, like variety acts. And farces: hundreds of smirking burlesques about home life. The errant husband tiptoes home late at night, but is found out by way of trick photography.

There were epics in trick films as well, also abbreviated as if on a short fuse, but the set pieces were splendid, particularly Méliès's Baroque sea creatures,[10] or moonscapes by way of Jules Verne and H.G. Wells, with a touch of operetta staging. *Tableaux vivants* suddenly twitch into life—stillness into pixilation. Drawings frame the characters, illustrated vignettes swarming around them like a fishing net.

After 1896, practically every animator, following the path set by Emile Cohl, produced trick films along with cartoons, including the young Disney (the *Alice* series, 1923). In New York, Fleischer's cartoon *Koko's Earth Control* (1928) spins Manhattan skyscrapers like a bag of blocks. In one scene, cutouts of the skyline collage diagonally into each other; this accidentally resembles modernist documentaries about cities by Vertov or Ruttmann. Taking this further, all forms of surprise movie montage might seem to qualify as special effects.

Mattes

The *composite* is fundamentally a *matte*. Standardly—before the computer algorithmically turned all of these into data—mattes came on glass, as mirrors, or through gauze (very much like magic lanterns)[11]

Glass shots (as in paintings and transparencies);[12]

Mirror shots (for sharper-focus superimpositions, including miniatures);

In-the-camera matte shots. Where part of the frame was matted out in front of the camera, while shooting. This began simply as an opaque card, or as glass matte, a trick established by 1911;[13]

Bi-Pack Optical Printing: One film image is projected on to part of the frame, while the camera shoots the rest of the frame. Thus, the *moving matte* for wipes and various overlaps, as well as in action (traveling) mattes. Bi-pack gadgets evolved into optical printing machines,[14] some as big as a room, long capsules inside a massive steel housing, long enough to hide a body, as if for an MRI scan. But big or just on tabletops, the same principle applied: a projector sends back images to the camera, which, in turn, keeps shooting the scene.

Until the nineties, optical printing was the workhorse of special effects. It could engage as many as three printing heads at once—to wipe, slide, and composite movement. But by 2000, it was gone, relegated to obscure downstairs rooms at the few effects houses in L.A. The printers became a piece of nostalgia, a machine twenty years old, operated often by old-timers near retirement, for an ever-decreasing cadre of older clients.

Of course, masterpieces in optical printing, like Zbigniew Rybcynski's eight-minute tour de force, *Tango* (1980), are very useful case studies. They remain very timely, particularly for young digital filmmakers. In *Tango*, the optically printed montage contains over thirty loops composited into a single space. Thirty people do not meet while they drift through an obvious movie miniature of a room, in hyper-saturated colors. The composites were exaggerated, to deliver a strangely aching pleasure, a balletic sense of Artifice.

No body bumps into anyone. No one actually exists. They only composite side-by-side. It is alienation by looping. The room has no air, only movement. Each loop repeats like a dog burying and digging up the same bone.

First a boy loses a ball through a window, and climbs over to fetch it. Then a thief breaks in, and makes off with a package. A girl enters by a side door. She loses herself in homework, doesn't see the man doing a handstand two feet away. Another man climbs beside her to screw in a lightbulb, but falls badly and howls like a banshee.

No heads turn, not even when a naked woman walks slowly across the room. She sits on a bed. Bored, she slips on a dress. Meanwhile, a young couple on the bed try to have intercourse. The boy grabs his girl too eagerly. The girl closes her legs, and dashes away. He is left bare-assed and dismal.

On the same bed, a mother re-diapers a baby, while an old man spanks his little dog for diddling there. A drunk weaves around everybody like a plume of smoke. The plumber carries a toilet past a man blindly eating his breakfast. And so on, at least thirty loops in all.

I have shown *Tango* fifty times to students, and it always seems to startle them, particularly the digital designers. Those optical-printer techniques have disappeared. But showing the seams of an optical composite remains strangely powerful, perhaps even more so in an age of smooth texture maps, and seamless Flame[15] effects.

Traveling Mattes: A part of the frame is masked off during shooting, then action added there later on.[16] For generations, the mask was blue screen. On television, the blue screen was color-keyed (chroma key).

Rear Projection: Action projected behind a screen, then filmed behind the action, for example, the rearview mirror inside automobiles during a car chase: (circa 1935). Or a fuzzy ocean behind Fred Astaire while he leans on the rail of an ocean liner, and pitches woo. Rear projected imagery sharpened during the television era. Chroma-key systems quickly became a standard in feature films as well.

Mirror Mattes: These made it easier to insert miniatures without showing much of a seam—classically in Fritz Lang's Metropolis. Miniatures of the New York that Lang had seen the year before were placed in a corner, then reflected off a mirror tilted at a forty-five-degree angle. This removed glare as the image bounced on to the mirrored matte in front of the camera. I had student designers rebuild this device, called the Shuftann technique,[17] and was amazed. The miniature indoors suddenly transported itself to the patio, against a smoggy hillside. It was indeed Baroque, three acts in a few seconds. For an instant, I felt like someone watching the Kinetoscope in 1895.

The World Through Glass

In an age of optical scanning, the look of optical printing is considered a bit artificial today by f/x people in the industry. At the same time, in outdoor malls, the staging begins to look more like movie mattes, or trompe l'oeil. Like

a movie set before the cameras roll, it becomes a Baroque sculptural collage. Even model drawings for mattes resemble handbooks from Baroque eras.[18]

The space appears as trompe l'oeil; then the shutter clicks. This clash of fake with real is filtered smooth once it passes through a lens. That causes a diffusion effect, like the world through glass before you open the car window. The glass collapses the middle ground into the background. That diffusion turns all film into a hidden effect—the erasure of difference; the invention of a flattened solidity.

The movie set is Baroque (Artifice invading nature). Once that Artifice filters through the lens, the movie becomes panoramic (the machine replacing nature). We walk through the Baroque, while it vanishes on film. Silent filmmakers occasionally toyed with this parallax. Buster Keaton made that part of his signature. A building collapses on Buster. The gap in the door frame saves him. But he looks strangely unconcerned, even though the facade weighs over a thousand pounds. Its sculptural solidity turns into trompe l'oeil against the flat screen.

The air itself can be trompe l'oeil as well. And Los Angeles's climate has its own diffusion effect—a very, very faint fog over a semi-arid sky. It was called haze in 1890, then smog in 1943. Clouds almost never seem to float overhead in L.A., unless it is humid. They sit like matte paintings over the mountains, in deep focus, on the horizon.

Silence/Silents

After early experiments with the trick film (1895–1908), movie effects matured during the twenties, most of all in Germany; and very much in the spirit of Baroque immersion. At the UFA Studios in Berlin, very elaborate trompe l'oeil sets were built, then dusted with Expressionist lighting, particularly for *The Cabinet of Dr. Caligari*, *The Golem*, *Nosferatu*, and Lang's *Mabuse* series and *Metropolis*. At the same time, in the U.S., Willis O'Brien vastly improved model animation for feature films—armatures inside skeletons, essentially automata in stop-motion. He launched what became standard in American action and horror films. His early reels (1919) still amaze students, much the way they apparently astonished Houdini in 1922, at the height of his crusade against paranormal fakes.[19]

Thus, the effects movie grows from absurdist vaudeville trick films to the epic. In turn-of-the-century bedroom farces, like those made famous by Émile

Cohl, men's bodies explode, vanish, fly on their mattresses like biplanes. In Cubist, Surrealist, and Cubo-Futurist effects films, the absurdist composites take on more aestheticized ironies, as in the feature length Aelita[20] (Soviet Union, 1924), perhaps unintentionally campy—a very stagy, costumed allegory about a Cubo-Futurist Mars brought to revolution by a documentary, factographic earth).

Similarly, but very intentionally, Dada-inspired substitution shots and collage are composited in Duchamp's silent films; and in Man Ray (most of the work) and Leger's (only at the end) *Ballet Méchanique*. The most famous substitution shot in experimental film of the twenties came from the butcher shop downstairs: a cow's eyeball is slashed open while the fluid leaks out, in Bunuel and Dalí's *Andalusian Dog* (1928). Also, bodies vanish behind a pole (an old slapstick gag) in Richter's post-Dadaist spoof of *neue sachlichkeit* in *Ghosts Before Breakfast* (1928, substitution shots again); and substitution composites in René Clair's time-out-of-time *Paris Qui Dort* (1923).

But from prerevolutionary Russia came the very special case of Ladislas Starevich. As early as 1912, Starevich completes fully realized, stop-motion masterpieces with miniatures, insects as automata in brilliant clockwork. He reduces Feydeau farces to the size of a silk-lined pocket watch (*The Cameraman's Revenge*). Similarly, I should mention that trick advertising was a staple in many movie programs as early as 1912, particularly a live-action human being grafted on to a butterfly; or a cigarette ad where a man's nose changes into a chimpanzee and then into a baby[21]—all this nearly twenty years before Oskar Fischinger's stunning trick advertisements for the movies, with dancing, goose-stepping and skating cigarettes; or nuclear energy seemingly rewiring the television screen (1950).

Indeed, as the machinery expanded, the effects were not so much "more real," as simply grander in scale. In the twenties, much larger movie lots in Los Angeles and Berlin required a special-effects division inside the studio itself, the formal beginning of a craft within a corporate industry. Handbooks of the 1920s describe the standardized routines, rather primitive at first, but then again, special effects are often a simple trick well dressed. Even as late as the twenties, the basic effects tool was still the human hand cranking the camera frame by frame, to insert ghosts, or to animate dolls.[22]

By the thirties, automated systems had replaced hand-cranking. However, on the screen, the results looked much the same. As I mentioned, Willis O'Brien's magisterial dinosaurs and apes were already vibrant by 1920, in early shorts. His work on *The Lost World* (1925) promised essentially everything

that *King Kong* delivered eight years later, with its eighteen-inch model apes turning into the fifty-foot Kong, along with a man in an ape suit for the final struggle atop the Empire State Building. Kong on his island is shot in blue light against a red light background; then his flora and fauna is composited in, particularly in his lair, copied from Dore's illustrations for Milton's *Paradise Lost*.[23] Indeed, *King Kong* still applies Victorian theatrical devices, as did much of early cinema.

In the end, until the era of digital effects begins in 1968, with *2001*, the evidence points more toward consistency than evolution of form. The essentials freeze, with minor enhancements by 1935, for another thirty years. Thus, handbooks since the twenties standardly repeat a few categories most of all,[24] as follows:

- *Special* effects provide shocks—the monsters, the tidal waves crashing through the town.
- *Hidden* effects, mattes in particular, "embellish or aid in the artistic conception of the picture,"[25] usually to save money and stay on the lot.
- *Scene changes* require effects—fade-ins, irises, dissolves.

Effects enhance point of view, through attachments on the lens that resemble keyholes, latticed windows, binoculars.

Effects deliver Expressionist or Impressionist distortions, with trick lenses, not unlike trick mirrors at amusement parks, used by director Abel Gance in the twenties, by hundreds of cinematographers before and since.

Basically, all these effects were possible *in-camera*, with very little postproduction. Even in the thirties, for those wonderfully cheesy weekly adventure serials (Buck Rogers, etc.), many effects still came out of the cameraman cranking slower or faster, to control the diaphragm of the lens. Or the camera was run in reverse: Winding the film backwards (reversing the belt on the take-up magazine) was a particularly ripe old trick. It allowed the cameraman to mask part of the frame, to add ghosts and metamorphosis. By rewinding, fadeouts could be timed to substitute one body for another, back to Méliès in 1895.

Atmospheric effects were made out of household remedies, miracles in candle wax. Tilt the camera and you have the actor walking up a building.[26] A typhoon can be a twist of cotton sprinkled with coal dust. Oatmeal can look convincing as snow or lava, depending on whether it is cooked or left as flakes.[27] Technical advice from the twenties is often not that different from the fifties: "Burning trestles are usually soft wood saturated with turpentine, which pro-

duces a black smoke that photographs well." "In using miniatures on water … take care that no bubbles form." They will look "about the size of hogsheads compared to the model ship."[28]

Atmospheric gimmicks of the thirties and forties were equally home-brewed, the water tanks and fog machines, the oil in water to keep the bubbles tiny enough when miniature submarines were sunk. This is Artifice come back as Victorian toy soldiers: little battleships that are still charming to see, because they have the psychotropic ironies of children playing in a bathtub, or the interiority of a dollhouse[29] (another standard prop). They also remind me of Ernie Kovacs cutting up cardboard for live TV in 1955, and propping it in front of the lens.

At the same time, the scale could be masterful. By 1937, John Ford's *The Hurricane* destroyed a Polynesian village indoors, under roller-wave machines, and three-inch hoses, via winds from airplane motors.[30] In 1947, the Andes (or at least enough of them) were rebuilt in a ravine at Lone Pine, California. "To the camera it looks like the McCoy. But … behind the scenes … it is a blend of wood, plaster and ingenuity"[31]

Compositing Time and Space

We expand the principle of compositing:

Special effects add layers in space (on the screen and inside the theater). They also add layers to time itself, through stop-motion, or morphing. Most of all, they mix animation with live action. For example, animation is the art of compositing frame by frame. Essentially all special effects are animation inserted into a live-action space, or time.

With this expanded definition, we return to 1920. A standard text at the time was Carl Lewis Gregory's *Motion Picture Photography*.[32] Gregory begins by setting up two categories of effects:

First, some effects are meant to be "'*fake*' to deceive the eye." These he calls special effects. And second, certain effects are "used to embellish or aid in the artistic conception of the picture"[33] (fade-ins, irises, trick attachments for keyholes, latticed windows, binoculars).

In other words, some tricks are supposed to be noticed; others are supposed to stay hidden. And thirdly, some are simply part of how scenes are assembled so they follow each other; that is, they are aesthetic cues, like turning a page, or the actor walking forward to do a monologue.

Thus, in Hollywood for generations, that boiled down to three kinds of effect: first a *special effect*, second a *hidden effect*, and third a *scene change*.

As of 1920, *scene changes* were classified in the trade as "trick photography." For example, fade-ins were "tricks," along with irises, simply because they required special cranking by the cameraman, to control the diaphragm of the lens. Point of view was a trick as well. Trick attachments were added to the lens for keyholes. Openings cut out of brass could resemble a latticed window, or binoculars.

Winding the film backwards, however, still remained the heart of both hidden and special effects (reversing the belt on the take-up magazine). This allowed the cameraman to mask part of the frame, to add ghosts and metamorphosis. By rewinding, fade-outs could be timed so that one body would replace another. Time and space were composited by controlling the speed and direction of the camera: cranking. This was the sum of it, as of 1920, timing and cranking.

Leftovers from Méliès still worked, like tilting the camera to make someone walk up a building, making the horizontal look vertical.[34] And typhoons were often no more than a twist of cotton and coal dust, pushed along by a gofer. By the late teens, bipack systems for still and moving mattes were already in wide use, leading to the Dunning-Pomeroy "self-matting"[35] technique, refined later in *King Kong*.[36] Optical printing took over by the forties, then by the late fifties, color separation, as in television: chroma key.

By the late nineties, all that was going the way of the dinosaurs. In 2002, I visited one of the last effects houses using optical printing. The man in charge of the optical printer had a paper box for a chair, and was grousing. Upstairs, the man in charge of Flame, the new $250,000 digital matting system (discount price), had all the chairs he needed. On Flame, he made places and faces morph as easily as if they were Baroque ceiling painting. The line between the composites (the Artifice) is disappearing throughout the arts and our visual culture. We are indeed in the same place at once, and no place in particular. We finally leave the Victorian stage, and go back to the occult laboratory of 1650, the cabinet of curiosities as standard grammar in all cinema.

For a century now, special effects has turned into hidden effects, and then into film grammar. Then crafts technology simplified the method. As lap dissolves became much more common, cameras with back-winding devices made the superimposed layers look cleaner. Negative to positive film (neg/pos) improved dissolves by simply dissolving "the exposed 'negative' part of the emulsion."[37] Tricks with mirrors improved to "fifty-five mirrors," for ghost effects

and for axial lighting (to add captions). Mirrored sticks could extend or compress the picture, or cross fade.[38]

After 1945, in the era of noir aesthetic, film grammar relied more on trick photography as film grammar, toward *expressive effects* like those pioneered by German cinematographers in the twenties. That meant not only more dissolves, but deeper focus, sound overlapping, faster film, more gray tones. But improved paraphernalia inside the soundstage did not always improve what made the effect special. For example, Willis O'Brien's work for *Mighty Joe Young* (1948) looks only a trifle smoother than *King Kong*. And in many ways, the awkwardness of Kong's lumbering movements enrich his character, his pathos. Also, O'Brien's student Ray Harryhausen may have added new monsters and new gestures in the fifties, but he often needed only slight technical changes. Harryhausen's personal signature—the unearthly dead thing suddenly jumping to life was what made his work unique. The stop-motion effect itself took on relative stability after 1925.

Even if one studies the improved techniques by Harryhausen for *Clash of the Titans* (1981),[39] late in his career, we are still inside the O'Brien tradition. Harryhausen's Medusa radiates an unearthly sense of pain, because she is trapped infernally in her body, and only her eyes penetrate outward—more expressive in some ways than *King Kong*, or is it? Color and mass have been added, as well as radio controls (called Dynamation) for much more complicated movement. But the utter breakthrough came with *Star Wars*—based, of course, on groundbreaking innovations with *2001* ten years earlier.

However, did this breakthrough remove some of the irony? The Artifice in Harryhausen's stop-motion adds a kabuki presence; the Medusa breathes her own unique air. She seems poised to steal our air; she's unearthly. By contrast, Lucas's stop-motion added an *immersive presence* to the screen that audiences felt was very different; how well I remember the hushed awe with *Star Wars* in 1977, the suburban charm of the gizmos and automata and weathered spaceships.

But Lucas's shift to softer video editing after 2000 may have erased some of the *expressive* effect of the early *Star Wars*, the boyish ironies. In 1977, Luke's working-class suburban home in deep space looked like its refrigerator needed defrosting. The hardware was dinged, the extraterrestrials were shopping-mall parodies of urban scum. That subtle impact—Luke's fragility—had a massive effect on the audience, what I call the American school of high suburban cinema, a hero of a thousand faces, but with lingering teenaged acne, as if Luke's voice were still changing while he played at soldiers against Darth Vader. Luke

and Han Solo's equipment looked as if it had been tooled in a garage, something untested and self-consciously artificial. The engine seemed rebuilt by teenagers, but could make warp speed, like those dingbat spaceships in thirties movie serials that Lucas liked so much.

There is a trade-off when one improvement erases the ironies, even the Artifice of another. One nuance is added and another is lost. Today, when we rerun Harryhausen's or O'Brien's work, it looks ardently handmade. We admire their balletic skill. Audiences sense that the digital is missing. The effects look industrial, die cut. That adds a nuance to our visual pleasure. The movement seems slower, more stylized, the surfaces more artificial.[40] When Coppola decided to include only effects that were not digital for *Bram* Stoker's *Dracula* (1992), he was making a statement about the late Gothic novel of 1897, comparing it to the costumed look of special effects before the computer (and their lingering debt to Victorian shockers onstage).

Pre-digital effects look quaint now, like the fringed roofline of a twenties office building. Therefore, *King Kong* is not received as it was in 1933; it fits with the decors of the Empire State Building as we now remember it. This is more than simply nostalgia; it is another edge added to the story itself.

Immersion

Movie special effects also generate a unique relationship to the theater space itself. They tend to be more immersive. For example, with computerized effects, the foreground of the movie practically disappears. The seat becomes a parachute into the middle of the action. To market this experience, stadium seating has become standard in all new American movie theaters—a launching pad into a cinematic space as comfy as a couch at home. The viewers are far more isolated from each other than in Cinerama during the fifties. The roar of the public is shut out. The seat becomes a pod dropped behind enemy lines. The hatch opens. Suddenly the random fire of Omaha Beach cuts, the viewer at the waist in *Saving Private Ryan*.

As if inside a labyrinth, we enjoy being overwhelmed by stadium seating, to be lost inside the foreground. The narrative frame of special effects have absorbed the theater seat as well as the air in front of the screen, and the immersive digital sounds behind you. The viewer is treated as an extra on set. The movie unfolds around the viewer like a pop-up map.

Of course, one senses this immersion already in the scenography of silent German cinema. By the mid-twenties, the scale of German art direction, costuming, and innovative use of mattes and lighting set a new standard. In New York, animated-effects films at Fleischer Studios—after 1919, but more after 1925—already satirize this standard. Fleischer invents breath-taking slapsticks for disaster movies that were not even made yet (again, Koko's Earth Control, 1928). Indeed, practically every animator from Emile Cohl onward, from 1899 forward specialized in effects films, including the young Disney, as I mentioned earlier—particularly the experimental effects films of Oskar Fischinger. In the late thirties, Fischinger even tried working for Disney, but only for a short while, until both men realized their mutual error.

Visiting Ourselves

Hollywood turned the lavish fake into glamour, in articles about "faking" the establishing shot on "floating studios," yachts in Athens, or Hawaii, with refrigerated systems down below.[41] Charles Clarke specialized in "clouds made to order," transparencies over a "bald" sky, clouds to fit the mood, from "bright fleecy" to "sombre threatening."[42] And explosions of all sorts, from black-and-white flash powders in *For Whom the Bell Tolls* (1943),[43] to electrically generated explosives coming today.

By the mid-nineties, these fakes took on a fetishistic transcendental quality; until finally the "making of" special effects became more important on DVDs than the movie itself. We learn how the character Mystique was invented hour by hour for *X-Men*. An obsession with prosthetics, with the collaging of the body into an automaton, and then into a mutant, makes the actor a composite.[44] Mystique's yellow eyes, like Harryhausen's Medusa, and her blue amphibious but eroticized flesh deeply resemble the costuming that Inigo Jones designed for masques in 1610. The Electronic Baroque rediscovers the prosthetics of the Baroque in 1610, while the rest of Mystique's body remains industrial, like a new industrial plastic.

Thus, in the logic of the story and the production methods, her body visits itself as a tourist—as an erogenous scripted space, but also as a body without organs, almost antiseptic, like a beautiful woman cheerfully imprisoned inside a corset. For Mystique, "seventeen large prosthetics and nearly one hundred smaller ones were applied to the actress (Rebecca Romijn)."[45] They were stretched over her muscular frame to absorb "the movement of skin under-

neath, so that there would be no wrinkles." One piece went from her knees to her lower back, so the actress could execute kicks over her head "without looking wrong." Thus, she became an ass-kicking "blue skinned mutant shape changer,"[46] covered in reusable silicon appliances.

We come so much closer to the parodies of the prosthetic face-lift in the movie *Brazil* (1984), where facial wrinkles were flattened away by Saran wrap. If special effects predict what is coming, our bodies may turn into a prosthetic host for things injected by media. Special-effects immersion is being miniaturized as well as monumentalized. The alien (or mutant) body becomes a movie set wrapped in prosthetics. With the making of the *X-Men* series, and a dozen f/x movies like it each year, the body becomes a labyrinth of prosthetics—a composite that allows for cheerful imprisonment inside a civilization dominated by special effects.