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CHAPTER **11**

# Animated Television: The Narrative Cartoon

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**Beginnings****The Aesthetics of the 1930s Sound Cartoon:  
Disney's Domination****UPA Abstraction: The Challenge to Disney  
Naturalism****Television's Arrival: Economic Realignment****TV Cartooning Since the 1980s****Summary****Further Readings**

**A**nimation has had a rather erratic presence on television. A mainstay of Saturday morning children's programming, small snippets of it appear regularly in commercials, credit sequences, music videos, news and sports, but there have been long stretches when there were no prime-time cartoon shows. After *The Flintstones* ended its original run in 1966 there wasn't another successful prime-time show until 23 years later, when *The Simpsons* debuted. Since 1989 there has been something of a Renaissance in television animation. Numerous prime-time cartoon programs have appeared and at least three cable channels have arisen that feature cartoons—the Cartoon Network, Nickleodeon, and Toon Disney. And, of course, cartoons continue to dominate the TV ghettos of Saturday morning and weekday afternoons.

Although numerous new animated programs are now being created, many of the cartoons regularly telecast today were produced fifty, sixty, or even seventy years ago. As much as any other aspect of television, cartoons

illustrate the medium's ability to recycle old material. Thus, to understand animation we need to examine the evolution of narrative cartoons in both film and television. This will be the general purpose of this chapter. However, as we outline cartooning's history we will also discuss its technology, aesthetics, and economics – each of which play a significant part in determining how animation is created and presented on television. From *Gertie the Dinosaur* (1914) to *South Park* (1997–), cartoons have depended upon technology to achieve aesthetic goals that are always restricted by cost (especially since cartoons mainly appeal to children, an audience without direct buying power). This chapter sketches how technology, aesthetics, and economics have intertwined to produce contemporary television animation as it has taken form in storytelling cartoons.

## Beginnings

Figures from cinematic animation were present at the various “births” of broadcast television. Among the very first experimental images transmitted by RCA/NBC engineers in the late 1920s was that of a wooden doll of Felix the Cat (Figure 11.1), a cartoon star who rose to fame in the silent cinema (Felix in *Oceanatics* [1930], Figure 11.2). It was placed on a phono-



**FIGURE 11.1** Early television star, Felix the Cat, was used in experimental TV transmissions.

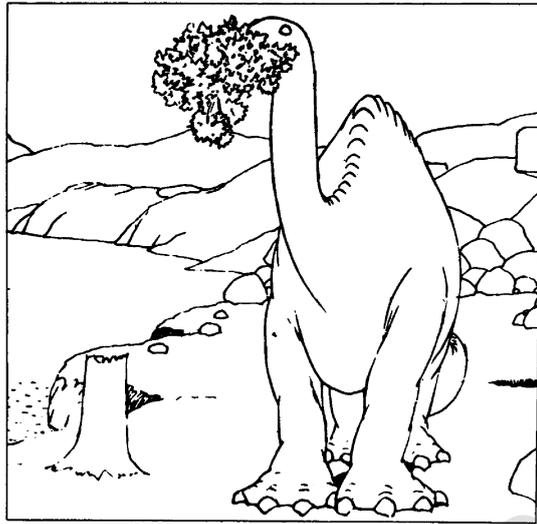


**FIGURE 11.2** Felix the Cat keeps walking in *Oceantics*.

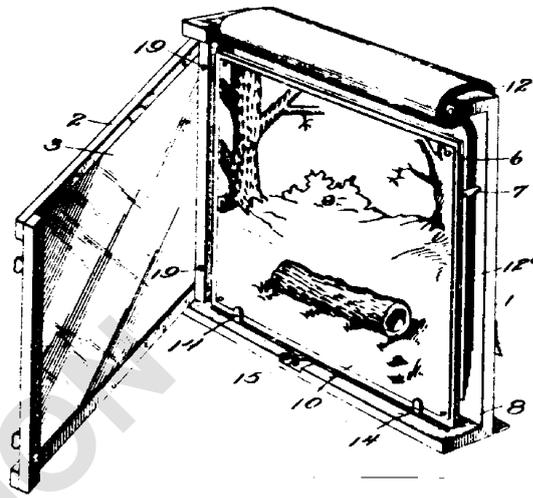
graph turntable and slowly rotated under painfully hot lights before the camera. A decade later, Disney's *Donald's Cousin Gus* was broadcast as part of NBC's first full evening of programming, on W2XBS, May 3, 1939. It would be many years, however, before cartoons as we know them would be created specifically for television. Early cartoon programming on television relied instead on short subjects initially exhibited in movie theaters and featuring now familiar characters such as Felix, Popeye, Bugs Bunny, Mickey Mouse, Donald Duck, Woody Woodpecker, Betty Boop, et al. As these shorts served to establish cartooning's basic mode of production, and since many of them still appear on television, a significant portion of our consideration of television animation will address the cartoon designed originally for the cinema.

Like live-action video and film, animation relies upon the illusion of movement being created from a succession of still frames. But that is where their similarities end. Unlike other forms of video and film, a camera in an animation production is not pointed at real people in real settings. Rather, conventional animators aim their cameras at handmade drawings on paper or cels and computer-based animation generates images out of digital models. Animation's mode of production leads to unique economic imperatives, necessitates certain technologies, and raises distinct aesthetic issues that do not apply to other forms of video and film production.

The factors necessary for the creation of film cartoons came together soon after motion pictures were invented in the 1890s, but their initial development was slower than that of live-action cinema. Established newspaper cartoonists such as Winsor McCay became involved with the infant medium after the turn of the century, but their task was daunting: approximately 16–20 frames had to be drawn for every single second of film, 960 to 1200 per minute.<sup>1</sup> McCay's influential *Gertie the Dinosaur*, which ran about seven minutes, comprised some 10,000 individual drawings (Figure 11.3). It's small wonder that McCay's films often took years to prepare. The length of time involved in such cartoon productions discouraged film studio executives. If cartooning were to become a commercial reality, it would need a more cost-effective mode of production.



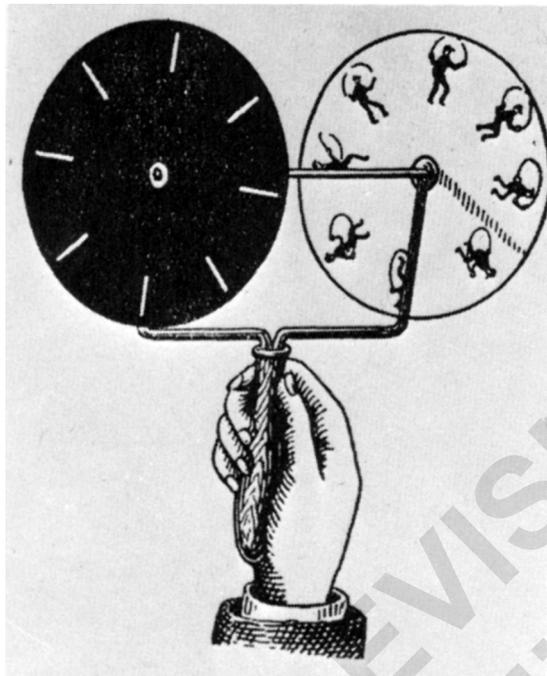
**FIGURE 11.3** Winsor McCay's *Gertie the Dinosaur* was an early cartoon success.



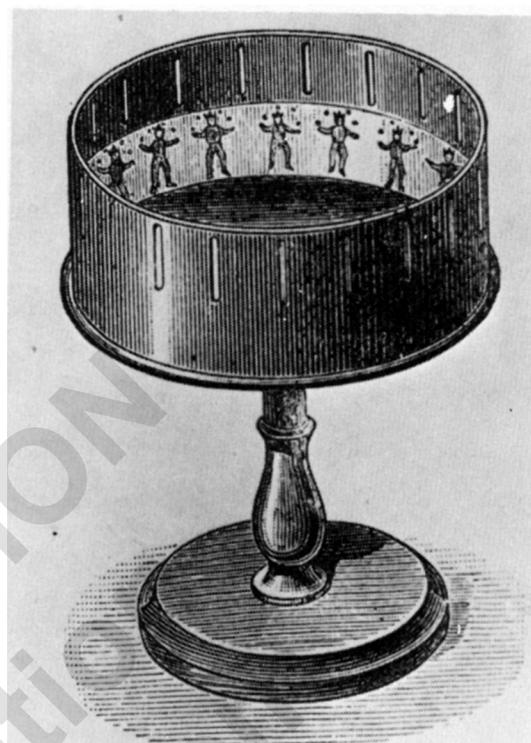
**FIGURE 11.4** Detail from Earl Hurd's cel patent application.

This economic imperative led to a simple technological refinement. McCay and other animators had been drawing and redrawing every detail of every frame to show movement, even when the action was occurring in a small part of the frame. In 1914 Earl Hurd applied for a patent on a process in which a transparent sheet of **celluloid**, commonly referred to as a **cel**, is placed before a background drawing (see Figure 11.4, a detail from the patent application). The animator then needs only to draw the segment of the image that moves (which is transferred to the cel). The background stays constant and thus does not need to be redrawn. At the same time, John R. Bray had been aggressively patenting animation techniques and suing anyone who dared infringe on them. He united with Hurd to form the Bray-Hurd Process Company and they began charging a fee for the use of cel technology – thus initially slowing its acceptance. Most animation studios of the 1910s and 1920s continued to painstakingly redraw every detail, to avoid the Bray-Hurd fees and Bray's litigious wrath. It wasn't until the early 1930s that animators converted to Hurd's system, and paid to use his cels. The shift to cel animation came close on the heels of another, more significant technological invention (one that also had economic and aesthetic ramifications): the popularization of sound film in 1927.

During the silent era, cartoons had little more status than parlor games, such as flip cards, the phenakistoscope (Figure 11.5), and the zoetrope (Figure 11.6), that had been popular during the nineteenth century.<sup>2</sup> Many of the studios that specialized in silent cartoon production went bankrupt before the coming of sound, because cartooning had not yet developed an efficient mode of production. With the arrival of sound, a major animation



**FIGURE 11.5** The illusion of motion was the source of amusement for 19th-century toys such as the Phenakistoscope and . . .



**FIGURE 11.6** . . . Zoetrope.

producer also arrived who would standardize and dominate theatrical cartooning and who was the first to take full advantage of the new sound technology. This was the impact of Walt Disney.

*The Jazz Singer*, the film that popularized sound in live-action cinema, was released in the fall of 1927. On November 28th of the following year, Disney released the first significant sound cartoon, *Steamboat Willie*, featuring Mickey Mouse. The popularity of *Steamboat Willie* had three major repercussions on the animation industry.

First, it established Mickey Mouse as a major figure. At that time he had only appeared in two cartoons that had not even been distributed to the public. He would go on, of course, to be one of the most widely marketed cartoon characters in the world, and form a central component of Disney's theme parks, long-running, self-promoting television program, and cable channel.<sup>3</sup>

Second, *Steamboat Willie* positioned Disney as the 1930s' preeminent producer of cartoons. His studios in California (previously animation production had been based mostly in New York) attracted prominent cartoonists of the time, and he soon developed a cost-effective mode of production. To achieve this economy of production Disney divided his workers into

specialized departments. Some focused on story development while others worked more on the animation. Disney's studio was also the first to use **storyboards** (Figure 7.1), sketches that show the progression of the entire cartoon. With a precise outline of the full cartoon, Disney's animators were able to work more efficiently, the narrative structure was clearer, and Disney, the producer, was better able to control pre-production and minimize costs.

In addition to the stabilization of production budgets through Disney-pioneered methods, distribution costs were also standardized in the 1930s when major studios such as Paramount, Warner Brothers, Universal, and MGM signed distribution contracts with cartoon studios, or created their own cartoon departments whose product they distributed to theaters they themselves owned. Thus, by the mid-1930s animation producers had developed a cost-effective mode of production and distribution.

Third, with *Steamboat Willie*, Disney set the aesthetic standards for cartoons with sound. His approach to cartooning would continue to govern animation aesthetics throughout the 1930s—determining much of how cartoons looked and sounded.

## The Aesthetics of the 1930s Sound Cartoon: Disney's Domination

### Naturalism versus Abstraction

The aesthetics of animation has long been split between **naturalism** and **abstraction**. Naturalism advocates animation that replicates live-action recordings as much as possible. According to this aesthetic, cartoon characters should resemble objects in reality, and our view of cartoon figures should resemble a camera's view of real humans and objects. Abstraction, in contrast, maintains that the essence of cartooning is lines, shapes, and colors (or shades of gray)—*abstract* forms that animators may manipulate as they wish.

The extremes of these two positions seldom exist. Only now are computer-generated animations reaching a level of technical sophistication where a fabricated character might be mistaken for a real human—as can be seen in *Final Fantasy: The Spirits Within* (2001; Figure 11.7)—but hand-drawn animation will probably never achieve this level of naturalism. And few cartoons are made that have no characters resembling real life objects, though there have been important exceptions to this, such as Norman McLaren's *Begone Dull Care* (Figure 11.8; 1949). Most cartoons, especially ones that are broadcast on television, balance these two extremes. Drawn characters and objects bear enough correspondence with reality for us to recognize them, but animators do not draw every leaf on every tree.

The naturalist impulse began to dominate the Disney studio's productions in the 1930s as they aspired to feature-length theatrical cartoons



**FIGURE 11.7** A computer-generated human in *Final Fantasy*.



**FIGURE 11.8** Norman McLaren's *Begone Dull Care* is the ultimate in abstract animation.

such as *Snow White* (1937). Disney's naturalism has continued through its recent releases such as *The Lion King* (1994) and *Chicken Little* (2005). Among the naturalistic changes Disney implemented during the 1930s were heightened rounding and shading of characters and objects. Silent-era characters such as Gertie and Felix the Cat tend to appear flat, emphasizing their two-dimensionality. Disney's animators used shading to create a more rounded appearance. Their characters, although two-dimensional, give a greater illusion of three-dimensionality. They seem almost bulbous.

### Disney's Use of Sound and Other New Technologies

Disney's *Steamboat Willie* was more than a silent cartoon with music attached. After all, this would actually have been nothing new. "Silent" cartoons were hardly ever presented silently. When they were shown in theaters they were nearly always accompanied by a pianist, band, or full orchestra. What is different about *Steamboat Willie* is that the movement in the image is *precisely* synchronized to the music, because *the music was planned before the images*. Linda Obalil explains: "Since music can be broken down mathematically, the animation was drawn to follow a musical pattern. For example, if the music had two beats per second, the animation would hit a beat every 12 frames (based on 24 frames per second)."<sup>4</sup> With this innovation, *Steamboat Willie* set an aesthetic standard for the synchronization of image and sound in animation. In the most highly regarded cartoons of the 1930s, 1940s, and 1950s sound does not merely overlay the image; instead, it dynamically interacts with character movement.

Music often forms the structuring principle for 1930s cartoons — as is evident in the titles of cartoon series such as Disney's "Silly Symphonies" and Warner Brothers' "Looney Tunes" (a rather direct parody of Disney's

pretensions) and “Merrie Melodies.” Because Max and Dave Fleischer—Disney’s rivals—had access to Paramount’s music library, their work, which was distributed through Paramount, also makes liberal use of songs. Their Betty Boop cartoons, *Minnie the Moocher* (1932) and *Snow White* (1933), for example, feature the Cab Calloway tunes “Minnie the Moocher” and “St. James Infirmary Blues,” respectively. Other Fleischer shorts highlight music by Ethel Merman, the Mills Brothers, and Louis Armstrong (*I’ll be Glad When You’re Dead You Rascal You* [1932]).<sup>5</sup> Many of these cartoons regularly appeared on television from the 1960s to the present—long after viewers would be familiar with Calloway, Merman, Armstrong, and so on. In their interpretation of preexisting popular songs, these musical shorts anticipated the animated music videos of the 1980s and later. (The Fleischers also pioneered follow-the-bouncing-ball musical shorts, in which viewers were encouraged to sing along.)

Disney incorporated other new technologies during the 1930s, always with the goal of greater naturalism. The most influential of these technologies were

- ▶ The **Technicolor** color process
- ▶ The **rotoscope**<sup>6</sup>

The history of color technology in film is long and complicated, but its end result was that three-color Technicolor—a process mixing yellow, magenta, and cyan dyes—would come to dominate color filmmaking in the late 1930s, 1940s, and early 1950s. Disney was among the first to experiment with the new three-color process, signing a contract with Technicolor that blocked any other cartoon studios from using it for three years. His first cartoon in three-color Technicolor, *Flowers and Trees*, was released in 1932, three years before the first live-action feature using the process (*Becky Sharp* [1935]). It was an instantaneous success and won the Academy Award for best animated short subject.

Although Disney’s use of color in *Flowers and Trees* is somewhat stylized, the more routine Silly Symphonies use color in predictably naturalistic fashion. Color was mostly another way for Disney to make cartoons look more like reality (which, after all, is in color). Stylized experimentations with color were left to more avant-garde animators.

Rotoscoping was not invented by Disney’s animators, but they used it to greatest naturalistic effect. The rotoscope was patented in the 1910s by Max Fleischer. It is a fairly simple device by which a single frame from a live-action film is rear-projected onto a light table (a table with a semi-opaque glass in the center). The animator places paper on the light table and traces the image cast by the live-action film. Then the film is advanced to the next frame and the process is repeated. The tracings are rephotographed, and the end result is an animated film that is based on the live-action images. Rotoscopes are still in use today, although typically the effect is now achieved through digital techniques and not the optical rotoscoping of the original process.

In line with their naturalist aesthetic, Disney's animators put the rotoscope to work duplicating human movement. For their first full-length cartoon, *Snow White* (1937), the dancer Marge Champion's body and movements were filmed and then, through rotoscoping, converted into Snow White's. Thus, Snow White is actually a cartoon replica of Champion. Disney's naturalistic aesthetic peaked in *Snow White*. Cartoons were as close to live-action as they would come until the advent of computer animation.

Rotoscoping is not necessarily a tool for Disney-style animation or naturalism in general, however. Recent music videos have incorporated rotoscoping as a way of transforming performers into animated images, which may then be abstracted in a variety of ways. One of Ah-ha's music videos shifts effortlessly between live action and stylized, rotoscoped animation (*Take on Me* [1985], Figures 11.9–11.10). The technology of the rotoscope is open to various aesthetic uses, not all of them naturalistic.

As the 1930s came to an end and World War II began, cartoons were well established in the cinema. With Disney's move into features at the end of the decade, he became the most prominent cartoon producer. But there were many other studios cranking out cartoon shorts with characters much more audacious than Disney's: Warner Brothers' Bugs Bunny, Porky Pig, and Daffy Duck; Fleischer's Popeye and Betty Boop; Walter Lantz's Woody Woodpecker; and MGM's Droopy, The Wolf, and Screwy Squirrel. Every major studio had a division for producing cartoons and, since they owned the major theaters, they also had assured exhibition for their cartoon product.

By the 1940s animation had found its own niche within the expanding film industry. Cartooning had long since developed an efficient mode of production through industrial specialization, the incorporation of cost-cutting technologies (for example, the animation cel), and businesslike



**FIGURE 11.9** A rotoscope blends live action and animation in Ah-ha's *Take on Me* video. An image of a man is traced in one shot and . . .



**FIGURE 11.10** . . . in the reverse shot, a woman has been similarly converted to a cartoon.

pre-production planning based on storyboards. It had also settled upon the basic format that would obtain to the present day:

- ▶ 6–8 minutes long
- ▶ In color
- ▶ Structured around music and sound effects

Cartoons' place in theatrical film exhibition seemed assured. At the time, movies were presented in double bills, and cartoons were a routine part of the short subjects (newsreels and the like) that were shown between feature films. Changes in film exhibition and the rise of television would change all this, absorbing and bringing to an end one form of the cartoon, but eventually spawning its own assortment of animation. We will detail these economic shifts below, but first we must consider an aesthetic change in cartooning that occurred just as television was beginning to make its presence felt.

### **UPA Abstraction: The Challenge to Disney Naturalism**

Disney and his naturalist aesthetic may have governed 1930s animation, but the early 1940s saw the disruption of his economic dominance and the rise of a new aesthetic of abstraction that has continued to have a major impact.

Disney's economic empire was briefly unsettled in 1941 when a strike against the studio resulted in the departure of several key animators. Among this group were John Hubley, Steve Bosustow, and Adrian Woolery, who would form the mainstays of United Productions of America (UPA). Obviously, the strike had little lasting economic impact on Disney as he went on to diversify his investments, founding Disneyland in 1954 and producing his long-running television program. But the eventual formation of UPA did provide the environment to nurture a new animation aesthetic. It contrasted markedly with Disney's work, which, after the 1930s, emphasized feature-length production, leaving the field open for other studios to produce animated shorts.

UPA's animators came to cartooning with a background in the fine arts and drawing. This nurtured an aesthetic that emphasized abstract line, shape, and pattern over naturalistic figures. UPA first achieved commercial success in 1949 with the Mr. Magoo series, but its aesthetic wasn't fully recognized until the Academy Award-winning *Gerald McBoing Boing* (1951). We can distinguish several characteristics of this aesthetic, each of which contrasts with Disney-style naturalism:

- ▶ Flattened perspective
- ▶ Abstract backgrounds

- ▶ Primary colors
- ▶ Well-defined character outlines
- ▶ Limited animation

**Flattened Perspective.** Throughout the history of drawing, artists have been concerned with perspective, with the rendering of the three-dimensional world in two dimensions. Drawings and cartoons have horizontal and vertical dimensions, but they have no true depth. Hence, the illusion of depth must be fabricated. One of the principal artistic developments of the European Renaissance was **linear perspective**, a method for representing depth in which the parallel lines of “reality” are made to converge at a single point—the vanishing point—in a drawing. Naturalistic animation such as that produced by Disney used linear perspective and other visual cues (for example, character shading) to heighten the sense of depth in their cartoons.

In a revolutionary move, the UPA animators rejected this illusion of depth. Instead, they flattened and distorted Renaissance perspective—as did avant-garde graphic designers and artists of the time. In one shot from *Gerald McBoing Boing*, for instance, a small boy, Gerald, walks up a flight of stairs (Figure 11.11). There are four or five vanishing points, and none of them match. A doorway is askew and the side of the staircase is covered with an abstract design. The image resembles cubist paintings more than Disney’s *Snow White*.

**Abstract Backgrounds.** Closely related to this flattening of perspective are the revolutionary backgrounds in UPA cartoons. The background in the shot from *Gerald McBoing Boing* consists of broad, abstract fields of color. In one respect, this returned animation to the earliest days when minimal backgrounds were used because animators were redrawing entire



**FIGURE 11.11** Abstraction in *Gerald McBoing Boing*.

frames. After the animation cel was invented, backgrounds became quite elaborate, since they only had to be drawn once for each shot (only moving elements were redrawn). The Disney features in particular have intricate backgrounds in nearly every shot. In striking contrast to Disney, the UPA films completely reject this naturalistic style.

**Primary Colors.** Coloring in cartoons has never been subtle. The technology of the three-color Technicolor process in the 1930s made muted colors tough to achieve because Technicolor's hues tended to be very rich and deep (that is, highly **saturated**). That animators were able to get as much variation out of Technicolor as they did is a testament to their inventiveness. It is somewhat ironic, then, that in the early 1950s, when Kodak was introducing a more subtle color technology (Eastman color), cartoonists were experimenting with prominent, almost garish, primary colors in the abstract color fields of cartoons such as *Gerald McBoing Boing*.

**Well-defined Character Outlines.** In another "innovation" that actually made cartooning resemble its formative years, the UPA animators rejected the fully rounded, shaded, and molded look that Disney achieved (at great expense). Instead, they sharply outlined their characters and filled the outlines with single colors (that is, little or no shading)—as had been done decades before in *Gertie the Dinosaur* and the Felix the Cat series (Figures 11.3, 11.2). This contributed to the flattening of perspective by making the characters themselves appear two-dimensional.

**Limited Animation.** By far the most significant change inaugurated by UPA, at least as far as television is concerned, is so-called limited animation. There are three ways in which UPA animation is more "limited" than other animation of that time, especially compared to Disney animation such as *Snow White* and *Pinocchio* (1940).

First, in limited animation, the amount of movement within the frame is substantially reduced. Once animators began using cels, they stopped redrawing the entire image for each frame of film. But still, 1930s and 1940s animators typically redrew entire characters who were involved in any form of movement. Even if a character were just speaking and moving its mouth, the character's whole body would be redrawn. In the most extreme limited animation, in contrast, when a character speaks, only its mouth moves. Cels of the mouth drawings would be placed over one of the entire character, which, in turn, would be on top of the background. As the character speaks only the mouth-drawing cels are changed. Thus, as animation has become more and more limited, less and less of the frame has been re-drawn.

Second, in limited animation, eye blinks and arm, leg, and head motions are routinely repeated, using the same series of cels over and over. Consequently, the characters move in limited, repeatable directions. In full animation, characters make a large number of unique movements, which demand that a new set of frames be drawn.

Third, movements are constructed from fewer individual frames in limited animation. Consider a simple movement such as Bugs Bunny rais-

ing his hand, a movement that takes one second. Since sound film uses 24 frames per second, there must be 24 drawings for this movement (or 30 frames per second for video). But even in full animation not all of the drawings will be *unique*. The movement might actually consist of only 12 cels, each of which is photographed twice. In limited animation the number of cels is reduced even below that of “full” animation, and the result is a less fluid movement.

The differences between naturalism (Disney) and abstraction (UPA) are summarized and parodied in a *Ren & Stimpy* (1991–1996) cartoon. Mostly, *Ren & Stimpy*'s director, John Kricfalusi, uses the abstract style that UPA pioneered – turning the backgrounds into abstract expressionist paintings (Figure 11.12). But in the “Man’s Best Friend” episode he renders the title characters in naturalistic, near-photographic detail (Figure 11.13) – drawing attention to the conventions of both styles. In sum, Figure 11.12 could have been done by UPA, while the photo-realistic cat and dog of Figure 11.13 align with Disney’s attempts to copy reality.

There are obvious economic advantages to UPA’s limited animation, flattened perspective, and abstract design (fewer, less-detailed frames mean faster production time); but there exists an aesthetic rationale independent of the financial advantages. Remember, *Gerald McBoing Boing* was a well-respected, Oscar-winning film of the time. One aesthetic justification is that this herky-jerky animation style mirrors the frenetic pace of the modern world – just as jump cuts do in the French New Wave films of the late 1950s and early 1960s. One argument for the abstract design is that it is the cartoon equivalent of art movements such as abstract expressionism, which drew viewers’ attention to the surface of the painting, making them aware of shape and formal patterns. In this sense, *Gerald McBoing Boing* may well be the only exercise in abstract expressionism which also won an Academy Award and was the model for its own television cartoon show (*The Gerald McBoing Boing Show* [1956–58]).



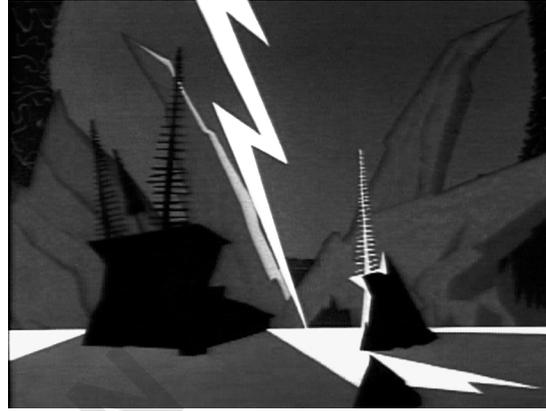
FIGURE 11.12 Ren & Stimpy as cartoons.



FIGURE 11.13 Ren & Stimpy as a realistic dog and cat.



**FIGURE 11.14** A cowboy punches abstractly designed cows in *Symphony in Slang*.



**FIGURE 11.15** Modern art design in *What's Opera, Doc?*

UPA set the standard for theatrical animation during the gradual demise of cartoons in theaters. UPA's Mr. Magoo series incorporated the money-saving aspects of *Gerald McBoing Boing's* animation, watered down its aesthetic of abstract stylization, and established what cartoons would be like during the 1950s and 1960s. All of the major studios soon followed suit with stylized cartoons such as MGM's *Symphony in Slang* (1951) (Figure 11.14) and Warners' *What's Opera, Doc?* (1957) (Figure 11.15). Even Disney finally capitulated and released the UPA-esque *Pigs Is Pigs* in 1954. The full and total victory of UPA animation style, however, would come in television.

### Television's Arrival: Economic Realignment

Television's ascent in the postwar years had direct and drastic economic effects on narrative cartoons.

First, it contributed to the demise of the theatrical exhibition of cartoons. As the film industry scrambled to economize during the 1950s and into the 1960s, the output of feature films tumbled to barely one-fourth of what it had been during the 1930s—from a yearly norm of approximately 500 to an all-time low of 121 in 1963. Most troubling to cartoon studios was that the film exhibition patterns were changing as the production declined. The double bill, the cartoon's *raison d'être*, was becoming extinct. With its passing, so did the need for short subjects to interject between the features. Shorts were shown before films on some single bills, but they were regarded by theater owners as an unnecessary expense. Perhaps most damaging to the theatrical exhibition of cartoons was a 1948 court ruling that forced studios to sell the theaters they owned, which meant that MGM, Warner Brothers, and the rest were no longer assured a venue for their product.<sup>7</sup> Suddenly, there was no guaranteed place to show cartoons

theatrically. Since major studios regarded animation and other short film production as of secondary importance anyway and because cartoons are relatively more expensive to create than live-action films, the cartoon divisions were soon abolished.

As cartoons were virtually eliminated from theaters, they found a new home on television. As discussed previously, the television and film industries have come to depend upon one other in a variety of economic ways. For animation, this interdependence meant that theatrical cartoon stars such as Bugs Bunny, Popeye, and Woody Woodpecker became broadly known to children of the 1950s, 1960s, and 1970s through their appearance on television. Most commonly, these cartoons were packaged for television's use in locally produced, after-school children's shows, or grouped together for Saturday morning programming, beginning with *The Mighty Mouse Playhouse* (1955–66).

The initial move to television was led by smaller animation studios/distributors because the majors were locked in seemingly mortal combat with television over rights to their film libraries – which included cartoons. Consequently, the minor-league Van Beuren Studios, which had ceased production in 1936, was able to successfully market cartoons (for example, Aesop's Fables) to early children's programs such as *Movies for Small Fry*, which was broadcast on the now-defunct DuMont network in 1947. Among the first of the majors, Disney came over to television in 1954 with *Disneyland*, and the following year premiered *The Mickey Mouse Club*. These programs maintained his exclusive control over the Disney animation library for decades to come. The other major cartoon studios began capitulating in 1955, when both Paramount-Fleischer-Famous Studios and Warner Brothers released their cartoons to television, and Terrytoons (from Paul Terry's Studio) was bought by CBS.<sup>8</sup> By 1960 most of the majors were releasing their cartoons to television, with the exception of the few cartoon series that were still running in movie theaters.

Bugs Bunny and the other Warner Brothers characters (Daffy Duck, Porky Pig, Tweety, Sylvester, and so on) made the most successful transition to television – starting in 1956 with *Bugs Bunny Theater*, which was syndicated to local stations. Then, in 1960, they premiered in a prime-time network series on ABC called *The Bugs Bunny Show* (1960–62). Most significant, the Warners characters found a permanent home on Saturday mornings, debuting in 1962 and remaining on the air ever since – the most long-lived of all Saturday morning cartoon shows. Virtually every child who has grown up watching television in the United States during the past fifty-odd years is familiar with these cartoons.

Cartoon compilation programs such as *The Bugs Bunny Show* do not contain new cartoons but use theatrical releases from decades past. This can result in some odd cultural ruptures. For instance, when today's child viewers watch *The Goofy Gophers*, a Merrie Melodies cartoon from 1947 that is still occasionally broadcast on television, they will witness one scene in which two gophers pile fruit on their heads and say, "Toodle-oo, Carmen" and "See you tomorrow, Hedda." The first refers to Carmen Miranda, a 1940s movie star, and the second to Hedda Hopper, a gossip

columnist from the same era. Both were known at the time for their outlandish headgear. To today's child viewers, plainly, the references can have little significance.

This disjunction between the text's discourse and that of the viewer is not just a matter of a changing frame of reference over the passage of time. It is also because these cartoons were originally designed for a general theatrical audience, an audience that was predominantly adult. Consequently, they were encoded with an adult discourse that even contemporary children could not have decoded. For example, in *My Artistical Temperature*, a Fleischer cartoon from 1937 that still appears occasionally on TV, Popeye and Bluto battle as rival artists. At one point Popeye has trouble arranging the arms on a statue of a woman. Finally, he tears them off, so that it resembles the Venus de Milo, and mumbles, "Oh! I think I got something here: a maskerpiece!" How many ten-year-olds in either 1937 or today would understand this joke? And yet, there is obviously much meaning and pleasure that children receive from cartoons such as this. Theatrical cartoons have often possessed a polysemy—a "double discourse" (child and adult)—that has facilitated their long-standing popularity on television.

Thus, the first cartoons on television, as well as many still being telecast, were drawn from the older libraries of theatrical product designed for general audiences (child and adult). The domination of television animation by theatrically exhibited cartoons could not continue once theatrical cartoon production declined. Television required more and more cartoon product, and the cartoon studios' archives were quickly being exhausted. An economically efficient mode of production was needed for the creation of cartoons specifically for use on television.

### Made-for-Television Cartoons

The history of cartoons produced for television begins in syndication, rather than network programming. Around the time that UPA was first garnering attention for its new animation style, Jay Ward and Alexander Anderson were preparing to syndicate *Crusader Rabbit* (Figure 11.16; 1948–51, 1957–69). Although never picked up by the networks, *Crusader Rabbit* was quite popular in the major TV markets and established much of the made-for-TV cartoon's mode of production. The persons to benefit most from this format and to bring it to network television were Bill Hanna and Joe Barbera, the preeminent producers of made-for-TV cartoons. *The Ruff and Reddy Show* (1957–60, 1962–64) was Hanna-Barbera's first foray into network TV animation. It was also the first network cartoon series to use material designed specifically for TV—although it also mixed in older Columbia Pictures cartoons. Moreover, *The Ruff and Reddy Show* was the first such show to stake out the territory of Saturday morning children's programming, proving to the networks just how lucrative those time slots might be. Three years later, Hanna-Barbera introduced *The Flintstones* (1960–66) to prime-time network programming.



**FIGURE 11.16** *Crusader Rabbit* utilizes very primitive, limited animation.

With *Crusader Rabbit*, *The Ruff and Reddy Show*, and *The Flintstones*, the blueprint for the made-for-TV cartoon was consolidated. Its format can be divided into five characteristics:

1. Program structure
2. Narrative structure
3. Limited animation
4. Emphasis on dialogue
5. Prosocial messages

**Program Structure.** Taking into account television's (commercial) interruptions and the need for segmentation, *Crusader Rabbit's* individual cartoons were even shorter than theatrical cartoons. They were compartmentalized into four-minute segments that could be combined in a single day's program or run separately on subsequent days. Not all made-for-TV programs use such short segments. The average *Flintstones* segment lasts longer than four minutes, for example. The point is that cartoon segments on television are often shorter than theatrical short subjects.

Since 1950s cartoon programs were made up of short individual cartoons, some structure was needed to unify and cohere the segments. Many programs solved this with a human host, sometimes accompanied by puppets. *The Ruff and Reddy Show*, for instance, was initially hosted by Jimmy Blaine, accompanied by the puppets Rhubarb the Parrot and Jose the Toucan. When revived in 1962, the program used Captain Bob Cottle and his puppets—Jasper, Gramps, and Mr. Answer. These hosts, both human and puppet, provided coherence to the disparate mix of material (old and new cartoons, live-action shorts, sketches performed by the hosts) presented in

1950s and 1960s children's programs. They also lured the viewer into staying tuned by introducing and promoting upcoming segments — much as a news or sports play-by-play announcer does. Since that time, hosted children's programs have gradually lost their hosts. The transitions between cartoons are now accomplished by voiceover narrators and visual material.

**Narrative Structure.** *Crusader Rabbit's* and *Ruff and Reddy's* segments are not self-contained narratives, as in theatrical cartoons. Rather, *Crusader Rabbit* and *Ruff and Reddy* are television's first cartoon serials — one segment picking up the action where the preceding episode left off. As Jay Ward commented, "We wanted to get the effect of an animated comic strip. The commercials would go in between the short segments."<sup>9</sup> In effect, each cartoon segment is like one panel in a comic strip. Incomplete on its own, it leads from one narrative segment (panel or animated cartoon) to the next. The effect, obviously enough, is to encourage us to remain tuned in, to impel us to continue watching through the commercials. Theatrical cartoons that have been packaged together for TV cannot provide this narrative propulsion, because they come to an explicit conclusion every seven or eight minutes. *Crusader Rabbit* established a form of narrative segmentation that would obtain in many subsequent television cartoons.

*The Flintstones* and other Hanna-Barbera programs modified this form of serialization. Like most live-action television series, the Hanna-Barbera programs come to a tentative conclusion at the end of the program. Each episode presents some dilemma that will be resolved. But the end of each segment *between the commercials* ends inconclusively, leading to the next segment — just as in *Crusader Rabbit* and unlike theatrical cartoons.

**Limited Animation.** *Crusader Rabbit* established that made-for-TV cartoons would use the limited animation style that had been pioneered by UPA. But made-for-TV animation does not use that style in exactly the same way. Made-for-TV animation rejects the *aesthetic* of abstraction that was embraced by UPA's theatrical animation, and for which it won honors such as the Academy Award. *Crusader Rabbit's* limited animation was born of the necessity to produce an immense amount of animation in a short period of time and for a relatively small amount of money. In specific, while it cost approximately \$60,000 to fully animate a seven-minute cartoon in the 1950s, a limited-animation cartoon could be created for \$10,000 or less. Hanna-Barbera's *Ruff and Ready* was produced for a paltry \$2,700!<sup>10</sup>

Do such stingy budgets make any difference in the texts themselves, in the way that these cartoons look? Do they differ, say, from award-winning shorts such as *Gerald McBoing Boing*? Yes, in small ways. UPA's style, at its most extreme, draws as much attention to the visual design itself as to the story being presented. Made-for-TV animation spurns that approach; the design of an image never intrudes into the storytelling, never impedes the progression of the narrative. Indeed, very little narrative information is contained in the images as early television's low resolution would not be able to show small visual details — even if money and time

had been available to further develop the drawings. This leads to a final narrative component of the made-for-TV cartoon: its reliance upon dialogue.

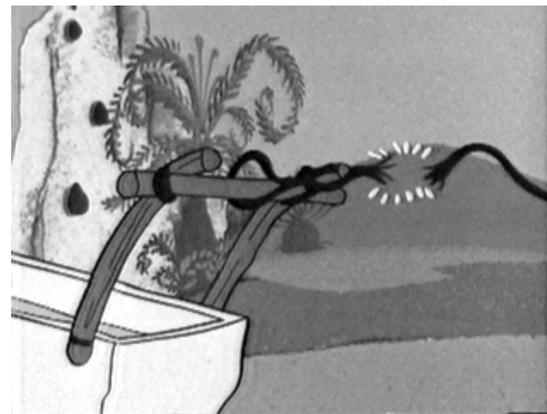
**Emphasis on Dialogue.** Because of their limited animation and acknowledging TV's low resolution (compared to the cinema), the Hanna-Barbera cartoons do not rely upon the visuals to convey narrative information or other meanings. Consequently, the visuals and the dialogue are often redundant. For example, in one episode of *The Flintstones*, we have the following five-shot sequence:

1. Long shot: baby Pebbles' carriage speeds along, pulled by their pet dinosaur (Figure 11.17).
2. Close-up: the leash breaks (Figure 11.18).
3. Long shot: the carriage rolls out of control (Figure 11.19).
4. Long shot: Fred and Barney chase the carriage (Figure 11.20). Fred says, "Oh no, the leash broke! Pebbles, stop the carriage!"
5. Long shot: the carriage passes a sign pointing to the zoo (Figure 11.21). Barney (in voiceover) says, "Ooooh, she's headed for the zoo!"

All of the dialogue in this segment reiterates what is already shown in the visuals. As in a soap opera, we could get most of the narrative information from a *Flintstones* episode by listening to it from another room. It has become what animator Chuck Jones called "radio with pictures." Contrast *The Flintstones* with one of Jones's *Roadrunner* cartoons to see the difference—as in one example where Wily Coyote falls silently into a canyon (Figure 11.22). The *Roadrunner* cartoons are entirely dependent upon visuals; the soundtrack consists almost solely of music, roadrunner beeps,



**FIGURE 11.17** In *The Flintstones*, dialogue often points out obvious action. In one scene, Pebbles is being towed by her pet dinosaur when . . .



**FIGURE 11.18** . . . we see the leash break and . . .

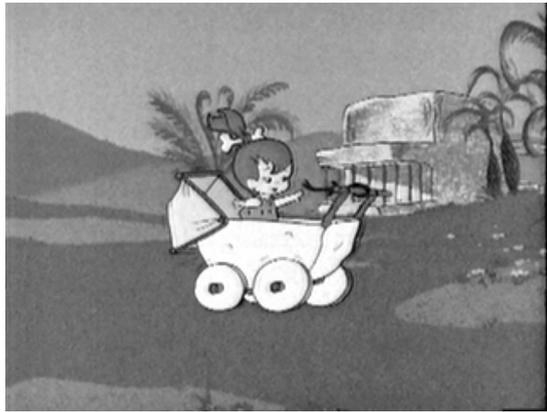


FIGURE 11.19 . . . the carriage pick up speed.



FIGURE 11.20 Fred and Barney pursue it and Fred exclaims, "Oh no, the leash broke! Pebbles, stop the carriage!"

and explosions. Dialogue never duplicates image, as it often does in limited-animation series.

The significance of the visuals is, of course, largely a matter of degree. Made-for-TV animation, even *The Flintstones*, does emphasize and derive humor from the visuals occasionally. And most theatrical cartoons are not as extreme as the Roadrunner series in their reliance upon the visuals. Still, it is generally true that made-for-TV cartoons rely upon dialogue and deemphasize the image more than theatrical cartoons. This is in keeping with television's overall accent on sound, as we discussed in chapter 8.

(*The Flintstones* also added a component of TV sound that has not been adopted by many other cartoon shows: the laugh track. This element of the program indicates *The Flintstones'* close relationship with the live-action genre of the sitcom. In fact, it has often been said that the program was an animated version of Jackie Gleason's *The Honeymooners*.)

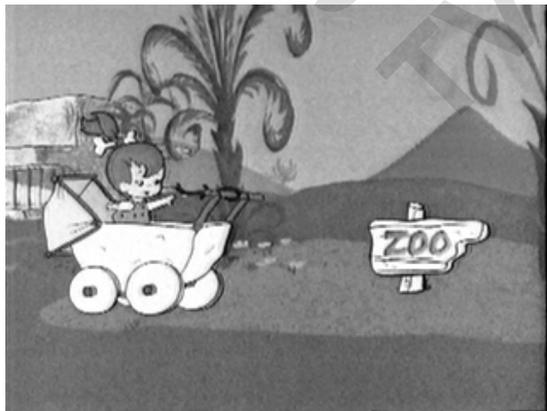


FIGURE 11.21 Barney needlessly points out: "Oooh, she's headed for the zoo!"

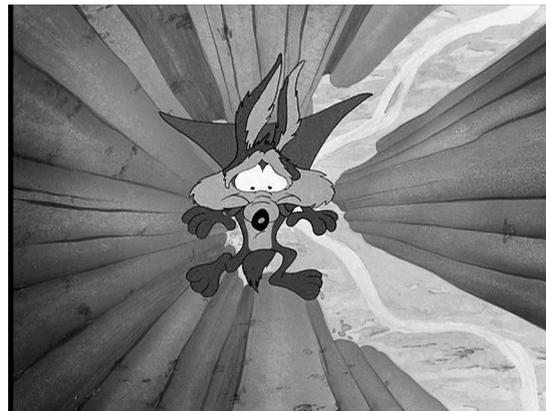


FIGURE 11.22 Violence without words in a Road Runner cartoon.

**Prosocial Messages.** Concerns over violence and a discourse that is perceived as antisocial have led to modifications of cartoon stories. Made-for-television programs on broadcast networks are strictly monitored by their (the networks') **broadcast standards and practices (BSP)** units. For example, when *ReBoot* was airing on ABC it repeatedly ran afoul of BSP. One of its producers, Gavin Blair, complains, ". . . we couldn't even have a punch-up [a fistfight] because that was violence. Also, we couldn't have jeopardy. Meaning we couldn't end an act with Bob [a central character] falling off a cliff and him yelling 'Aaaahh' as we cut to commercial — because that's jeopardy, and we'd upset the kiddies."<sup>10</sup> The brutality of older theatrical cartoons is also regularly censored by television networks and syndicators. In Warners' *Rabbit Fire* (1951), for example, Elmer Fudd blasts Daffy Duck in a variety of manners (Figure 11.23). When it is broadcast today, most of those explosions are cut out. Generally, violence has become much less visual in today's cartoons, but the U.S. Congress is still concerned about violent imagery in television, film, video games, and other aspects of popular culture. In the 2000s, there have been repeated calls for Hollywood to curtail the violence in media designed for children.

In addition to taming the anarchic violence of cartoon visuals, animators have also amended so-called prosocial meanings to the discourse of children's cartoons. For instance, in one episode of *He-Man and the Masters of the Universe*, He-Man runs around battling various villains. At the end of the program, he faces the camera and explains the value of cooperation to the (child) viewer. Every episode of *GI Joe: A Real American Hero* (1985) ended similarly, as if a 20 second lesson — ending with the expression "And knowing is half the battle!" — to close the show would somehow make up for the 22 minutes of violence and anti-social behavior that the show had portrayed. Theatrical cartoons, by virtue of their marginal existence and the distancing factor of drawings (compared to live action), were often permitted to violate social taboos against violence, sexuality, and



**FIGURE 11.23** "Hey laughing boy, no more bullets," chides Daffy Duck in *Rabbit Fire*.

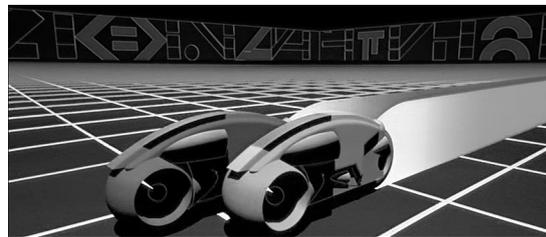
general chaos. Contemporary Saturday morning cartoons are the enforcers of those taboos. They speak the language of the dominant discourse.

### TV Cartooning Since the 1980s

By 1960, television cartooning had developed an efficient mode of production, a cost-effective aesthetic, and successful programming strategies (afternoons and Saturday mornings, but not prime time). The 1970s saw very little change in the TV cartoon and the genre seemed content with its existence on the periphery of the television schedule. But in the 1980s there was a revival of interest in cartoons that was sparked by accelerated developments in computer graphics technology, new modes of production and distribution (including new cartoon-oriented networks on cable television), and, as the decade came to a close, revolutionary new programming—most notably, *The Simpsons* (1989–), the show that single-handedly brought the prime-time cartoon back to life and rescued a struggling broadcast network (Fox). These changes resulted in a renaissance for the TV cartoon—with consequences both economic and aesthetic that spilled over from television to the theatrical, animated, feature film.

### Technology

As you might expect, the computer has had an enormous impact on contemporary animation. High-tech computer-graphics laboratories such as those at the California Institute of Technology, MIT and the New York Institute of Technology and avant-garde computer-graphics visionaries have been experimenting with **computer-generated imagery (CGI)** since the 1960s. However, this activity didn't have much affect on television and feature film until Disney's *Tron* in 1982 (Figure 11.24). A story of a computer programmer and video gamer who's sucked inside a computer, *Tron* features an animated world that was mostly computer-generated and set the standard for 1980s CGI. Throughout the '80s and most of the '90s, CGI was too expensive and time-consuming for narrative, serial/series television, but it found its way into commercials, credit sequences, and music videos—in addition, of course, into feature films and video games (see Table 11.1).



**FIGURE 11.24** The lightcycle race in *Tron* was an early instance of 3D, computer-generated imagery.

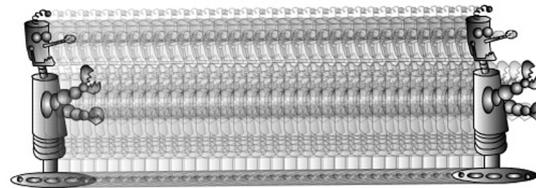
**TABLE 11.1** Notable Moments in Computer Animation (Since 1980)

1980	Arcade video game features a three-dimensional world for the player to move through— <i>BattleZone</i>
1982	All-digital CG sequence in a feature film—the “Genesis Effect,” in <i>Star Trek: Wrath of Khan</i> An elaborate CG virtual world, with a human inserted into it— <i>Tron</i>
1984	CG models (instead of physical ones) of spaceships in <i>The Last Starfighter</i>
1985	Wholly CG character, a stained-glass knight— <i>Young Sherlock Holmes</i> First widely distributed instance of morphing—the music video, <i>Cry</i> , by Godley and Creme CG world with three-dimensional CG characters moving through it—Dire Straits’ <i>Money for Nothing</i> CG characters/objects begin appearing in commercials—e.g., “Sexy Robot” (Canned Food Informational Council), Listerine bottle, Life Saver candies
1986	Entirely CG short film— <i>Luxo Junior</i>
1988	Live-action morphing in a feature film— <i>Willow</i>
1989	CG television character, performing live on <i>The Jim Henson Hour</i> CG water-snake effect, with the face of actress, in <i>The Abyss</i> Virtual reality demonstration at SIGGRAPH (Special Interest Group on Computer Graphics of the Association for Computing Machinery) conference
1991	Bulk of extensive, elaborate effects work for a feature film done on computer—including morphing between a human and a CG character, the T-1000 cyborg (who looks to be made of mercury)— <i>Terminator 2: Judgment Day</i> Morphing in a music video—Michael Jackson’s <i>Black or White</i>
1992	Virtual reality in film— <i>The Lawnmower Man</i>
1993	Multi-user, “first-person shooter,” personal-computer game— <i>Doom</i> Morphing in commercials—Exxon, Schick Plausible textures (fur, scales, etc.) on live CG creatures— <i>Jurassic Park</i> (sequel in 1997)
1994	Entirely CG cartoon show— <i>ReBoot</i> CG insertion of an actor into historical films, and the manipulation of historical figures— <i>Forrest Gump</i>
1995	CG feature-length film protagonist— <i>Casper</i> Entirely CG feature-length film— <i>Toy Story</i> (sequel in 1999) CG spaceship models in a TV show— <i>Babylon 5</i>
1996	Heightened detail in a three-dimensional gaming environment— <i>Quake</i>
1999	Mainstream interest in virtual reality—the success of <i>The Matrix</i>
2000	CG insertion of first-down line in live, televised football games
2001	Photo-realistic, CG, feature-length film— <i>Final Fantasy: The Spirits Within</i>
2004	All CG-backgrounds film, with live actors— <i>Sky Captain and the World of Tomorrow</i> CG film using performance capture for all actors— <i>The Polar Express</i>

As prices on computer technology have come down and hardware capabilities have grown, we've seen an increase in the impact of computers on all aspects of television, but especially on animation. Essentially, the computer may be used in two ways in the animation process. First, in the **tweening** process it assists animators by drawing frames for them. Second, in three-dimensional CGI, it wholly fabricates the image based on a set of instructions from the animators. Let's examine each of these processes in more detail.

In the mode of animation production that evolved in the 1930s, the work was highly specialized. To speed up the process, the top artists did not draw every single frame needed for a particular action. If, for example, Bugs Bunny were to raise his arm, the artists might draw two **keyframes** — the arm lowered and the arm raised. It would be the job of lower-paid animators to draw the in-between frames. This process thus came to be known as tweening, which, as you can imagine, was not a very glamorous job. Today's animation software has taken over the drudgery of tweening. For example, Macromedia Flash, a program commonly used to create compact Web animations, has a tweening function. If we wanted to have a robot hover from left to right we would begin by generating one instance of that robot and placing it on the left of a keyframe. Then we would make a copy of the robot and place it on the right side of another keyframe. Finally, we would have Flash tween from the robot on the left to the one on the right, from one keyframe to the other. The result would be an animation consisting of two keyframes and numerous tweened frames in between them. We can see the effect in static form in Figure 11.25. The robot keyframes are superimposed on either side of the frame. In between them are **onion-skin** (slightly lighter) versions of the tweened frames so that you may see the progress of the robot across the frame. (See our companion Web site, [www.TVCrit.com](http://www.TVCrit.com), to witness the robot's hovering in action — with sound.)

In terms of how the final product looks, animation made with computer-based tweening is not all that different from Winsor McCay's *Gertie the Dinosaur*, Disney's *Snow White*, or Hanna-Barbera's *The Flintstones*. Computer tweening has made animation much less expensive and has counteracted some of the restrictions of limited animation. Now that some action may be quickly tweened, made-for-TV cartoons can afford to include more movement — although the details of the animation of specific characters still requires manual animation. Still, if you compare the amount of physical

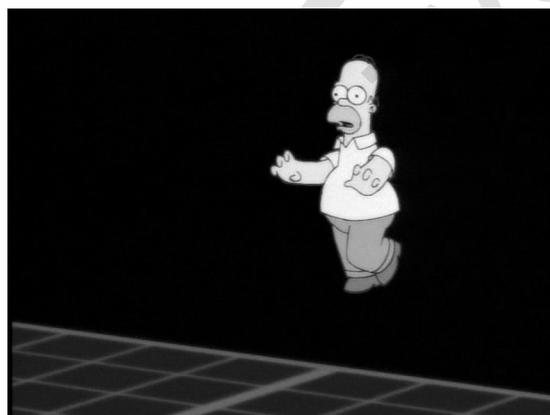


**FIGURE 11.25** Keyframes of a hovering robot (far left and right) are connected by tweened frames — indicated in light, onion-skin versions.

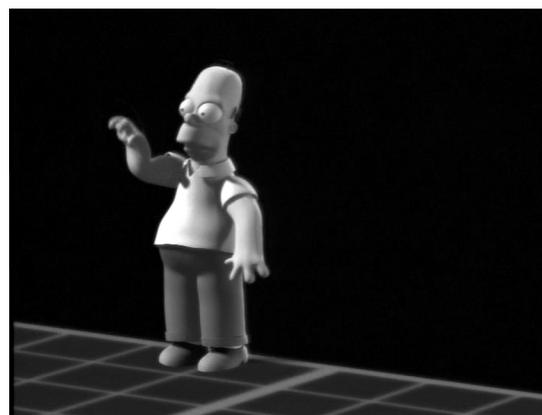
action in *The Flintstones* with what you see in a typical Saturday morning cartoon, you'll likely note much more activity in the recent program.

Even more significant than digital tweening is the evolution of three-dimensional computer-generated animation, which is rapidly changing the look of animation. In 3D CGI, a schematic model is created in digital format. The model may then be controlled by the animator and made to move in a variety of ways. Animators do not draw frames as they did in traditional two-dimensional animation, where the characters and objects appear relatively flat on the screen (e.g., Homer in *The Simpsons*, Figure 11.26). 3D animators direct the computer to generate frames based on the plotted movements of the model. In other words, the computer does the physical act of creating the individual frames based on instructions from the animator. The resulting images are still physically two-dimensional; they're still presented on a 2D television screen. But they create a greater illusion of three-dimensionality. To see the difference, examine the appearance of the 3D CGI Homer in Figure 11.27 – from a Halloween episode in which he transforms from 2D (Figure 11.26) to 3D (Figure 11.27). See how much more rounded and bulbous he appears in Figure 11.27? That is the effect of 3D CGI work.

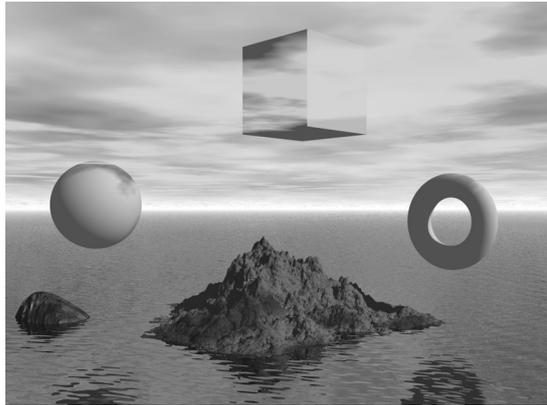
For further illustration, consider the image of an island with a huge surrealistic ball, cube and doughnut floating over it, which was created by Mark J. P. Wolf using Corel Bryce software (Figure 11.28). The process he used to create this image is not unlike stop-motion animation – as in the original *King Kong* (1933), *The Gumby Show* (1957, 1966, 1988), or Nick Park's *Wallace and Gromit* series – where an object is made to move by shooting a frame of it, moving it slightly, shooting another frame, moving it again, and so on. Instead of using a puppet or pieces of clay, Wolf has created virtual objects that exist solely within the computer. He can position those objects where he will and he can illuminate or shadow them as he wishes – with Bryce adding appropriate reflections. To generate



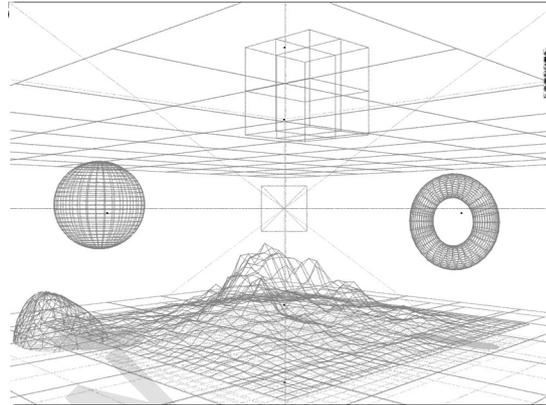
**FIGURE 11.26** Homer steps from the world of two dimensions to . . .



**FIGURE 11.27** . . . one of three dimensions, becoming much more bulbous in the process.



**FIGURE 11.28** A simple three-dimensional image was created by first building a . . .



**FIGURE 11.29** . . . wireframe image of the same scene.

movement, he repositions the objects in this virtual world and captures individual still frames (keyframes) of them – much as a stop-motion puppeteer would. The computer then tweens more images – generating frames to fill in between the keyframes. The result is animation created from original still frames of digital, virtual objects.

Wolf's first step in this process was to create a **wireframe** version of the objects – a virtual representation of their exteriors, which looks quite like a diagram of a Renaissance painting (Figure 11.29). Another option to fabricating computer models from scratch is to digitally trace or “capture” a three-dimensional object or human. In the **motion-capture** process, actors wear suits with reflective dots on them that computers can digitally trace. To the computer, these dots moving in three-dimensional space define the points from which a wireframe is constructed. It's quite similar to the decades-old rotoscope process, with the essential difference that in a motion-capture device it is a machine that is tracing a human's movement and not an artist. For example, a motion-capture device was used to create Dash, a computer-generated host on the now-defunct TechTV channel (Figure 11.30, on left). Computers also replicated the movements of actor Andy Serkis – both his body and his face – to create the character Gollum in the *Lord of the Rings* trilogy (2001–2003). In Figure 11.31 Serkis is wearing a motion-capture suit with small reflective dots attached to it and, similarly, his face is also painted with dots. He's in a motion-capture studio where 25 cameras record his every movement and facial expression. In Figure 11.32 he's in the white suit he wore on sets while interacting with the actors. In the final film (Figure 11.33), the white-suited Serkis is erased and replaced with the computer-generated Gollum, whose movements are based on Serkis's in the motion-capture studio. Just as Disney's use of a rotoscoped actor created the lifelike movement of Snow White in 1937, so did the digital motion-capture device produce the very lifelike, but creepy, behavior of Gollum over 60 years later. Thus, motion-capture systems can



**FIGURE 11.30** The TechTV channel used motion capture to generate Dash (left), a computer-generated host who interviewed real people.



**FIGURE 11.31** *Lord of the Rings'* Andy Serkis in a motion-capture suit.

also be used to insert a CG figure into environments where the animated characters interact with real-world humans. Another example can be observed in Figure 11.30 where Dash is interviewing a graphic designer. You can see how Gollum's and Dash's actions resemble the rotoscoped interaction between animated figures and humans in 1930s Max Fleischer cartoons and A-Ha's "Take On Me" video (Figures 11.9–11.10).

Wireframes are obviously not very realistic looking. They don't have substantial surfaces yet. The process by which different textures (water, rock, smooth surfaces, skin) are added to these frames is called **rendering**, which results in objects that appear strikingly three-dimensional on screen. The rendering stage requires the most resources and comes only at the end. The rendering of *Toy Story* (1995), the first entirely CG feature film, was particularly intense. Some 800,000 computer-hours were required to generate the 77 minute film. Each individual frame—consuming 300 megabytes of disk space—took from two to 15 hours to render and there are some 111,000 frames in the film!

Early computer 3D animation had its own distinct appearance that separated it from conventional 2D animation. *ReBoot* (the first CG TV pro-



**FIGURE 11.32** Serkis's movements were captured and . . .



**FIGURE 11.33** . . . converted into the character, Gollum.



**FIGURE 11.34** The computer-generated hero of *ReBoot*.



**FIGURE 11.35** A very realistic, but computer-generated, image of soldiers in *Call of Duty*.

gram) typifies this look (Figure 11.34), as do the ball, cube and doughnut in Wolf's image. Much CG animation has coloring and movements that are mathematically precise, unlike those done by human hand. Their surface textures have a uniform sheen to them. The quirks of human animation are missing. The biggest challenge for computer animators is to be able to render irregular surfaces such as fur, hair, and skin. The island in Wolf's image illustrates the advances CGI is quickly making. Its surface is rough, craggy and quite photo-realistic. 3D CGI animation for video games is also becoming increasingly photo-realistic. Note how Figure 11.35 from *Call of Duty 2* (2005), for example, portrays the subtle details of soldiers advancing into billowing clouds. It's clear that the technology for wholly computer-generated actors is here today and that it goes way beyond any dream of true-to-life naturalism that Disney had in the 1930s.

### New Modes of Production and Distribution

In the 1980s, production was internationalized. Much routine animation work, such as inking-in character outlines, began to be sent to firms outside the United States. Korean animators, for example, are largely responsible for creating *The Simpsons*—for which all of the tweening is still done by hand. The major conceptual work of most cartoons continues to be done in the United States, but the physical creation of the animation is often executed abroad. The reason for this change is clearly economic: Korean labor is less expensive than U.S. labor. Further, it is part of a global economic shift whereby national boundaries are becoming less important than financial ones.

Another significant change in mode of production was the arrival of Ted Turner's Cartoon Network, a cable network dedicated entirely to showing animated cartoons. The channel provided a 24-hour venue for the

hundreds of by-then-classic theatrical cartoons produced by Warner Bros. and MGM that Turner owned. These shorts, along with many classic Hanna-Barbera titles, were the primary programming features in Cartoon Network's early days. As time passed, the network began commissioning new series (discussed in the next section), many targeted at the (unexpectedly) older audience that was tuning in to watch the Bugs Bunny and Tom and Jerry cartoons they had grown up with on Saturday mornings.

One less marked change in cartooning's mode of production has been the increase in merchandising of cartoon characters. Cartoon characters have been merchandised since at least 1904, when the Brown Shoe Company based an advertising campaign around the Buster Brown comic strip character. But the 1980s saw an intensification of the link between sponsors and cartoon programs as several already existing products were transformed into television characters: for example, Strawberry Shortcake, the Smurfs, and He-Man. The difference between the characters and the products became less and less clear, and the textual difference between the commercials and the narrative cartoons diminished correspondingly. It became difficult for (child) viewers to discern where one ended and the other began. Television network's ultimate goal, to advertise products, had become confusingly entwined with the medium's entertainment function.

The rebirth of television animation in the 1980s was encouraged by new distribution channels—in particular, the Fox broadcasting network, the Nickelodeon and Cartoon Network cable networks, and the Warner Bros. studio. The three networks made good use of preexisting animation properties, specifically the classic Warner Bros. and MGM cartoons of the 1930s–1960s. But even in the late 1980s there was a desire to create new cartoon shows that went beyond the simple goal of consumption through entertainment that *Transformers* (1984), *The Care-Bears* (1985), and *My Little Pony and Friends* (1986) encouraged. And from this nadir of creativity *The Simpsons* was born.

## New Programming Strategies

The Fox network's domination of prime-time animation can be attributed solely to the success of *The Simpsons*. The show's record-breaking 18 seasons on the air (and counting) gives it a longevity and, in turn, familiarity that can be matched only by *The Adventures of Ozzie & Harriet* (1952–1966). (*The Simpsons* has actually been on the air longer than *Ozzie and Harriet*, although the 1950s sitcom had far more episodes in its 14 years on air.) Los Angeles cartoonist Matt Groening was approached in 1985 to create short animated segments for the variety-styled *Tracy Ullman Show* (1987–1990). The Simpson family, a typical nuclear unit with a blue-collar husband, homemaker wife, 2.5 children, a dog and a cat, appealed to the same middle-class audience that watched upstart Fox's other unorthodox comedy, *Married . . . With Children* (1987–1997).

Like its prime-time predecessor, *The Flintstones*, the approach to storytelling on *The Simpsons* combined the capabilities of the animated world

with the understood notion that these were “real” people; while the writers frequently stretch the bounds of physical endurance for humans (especially for Homer), the show operates within the boundaries of reality. Like so many other sitcoms, the existence of the family and the townspeople, who became an integral part of the series from the very beginning, always returns faithfully to the status quo (although occasionally a character will be killed off, as in the much-publicized death of Maude Flanders in early 2000). Homer never gets any smarter, Lisa never receives the recognition she (believes she) deserves, and Maggie never speaks. After more than 350 episodes, however, the program still relies upon some continuing storylines, and so oblique references to the “past” will occur. For example, Bart wishes for an elephant after seeing Apu on one in “The Two Mrs. Nahasapeemapetilons” (1997), only to have Lisa respond dryly, “You did. His name was Stampy. You loved him” —referring to the episode “Bart Gets an Elephant” from three seasons earlier.

*The Simpsons* has satirized popular culture fads, organized religion, conservative politicians, consumerism, the merchandising of its own products, and the sanctity of the nuclear family. Its characters have said and done things that would have caused a scandal if they weren’t cartoon characters. In these respects, it’s quite ground-breaking, but we can also see that it fits within the tradition of theatrical cartoons such as those Warner Bros., UPA and Fleischer made in decades gone by. In those cartoons as well there was an anarchic spirit and a willingness to push the boundaries of acceptability.

Programming changes developed on cable channels at the same time that Fox released *The Simpsons*. Nickelodeon made the unusual decision to commission new animated series instead of relying solely on older shows to which they had licensed the syndication rights (something they were already doing with the classic Warner Bros. shorts, series produced and originally aired overseas like *DangerMouse* and *Belle and Sebastian*, and others). Of the numerous ideas brought to the network around 1990, eight were given the go-ahead to create a pilot episode, much like live-action dramas or sitcoms being tested by network executives. This call for ideas marked just the first of several production differences we can see in Nickelodeon’s approach: by fostering the creation of a pilot, the network became involved with the creative process from the property’s inception. Nickelodeon’s ultimate goal was to generate a library of new animated series created for the network that they would ultimately control. Being involved with the creative process from start to finish let the network guide the programming content very carefully, a particularly important consideration for a network expressly for children. The three series that ultimately emerged from this veritable talent search were *The Ren & Stimpy Show*, *Rugrats* (1991–2004), and *Doug* (1991–1994).

One of the pilots chosen focused on a seemingly traditional cartoon couple—a cat and dog. The relationship between Ren Hoek and Stimpy J. “Stimpy” Cat was far removed from the “dog chases cat” stereotype. Both characters were neurotic, unpredictable, and obsessed with 1950s pop culture and scatology, which figured frequently in storylines, such as

the Christmas Episode “Stimpy’s First Fart.” Creator John Kricfalusi’s background explains much of the show’s idiosyncratic approach: a devotee of the classic Warner Bros. cartoons (and a disciple to WB director Bob Clampett), Kricfalusi got his start in TV animation by working on several children’s product-driven series, including Hanna-Barbera’s 1980s revival of *The Jetsons* and the return of an even earlier property, the 1940s Terrytoons superhero Mighty Mouse (which Kricfalusi worked on under animation director Ralph Bakshi).

The look, sound, and approach of *Ren & Stimpy* immediately set it apart from anything on network or cable television. Traditional sequences using cel animation would be interrupted by a close-up of a rotting tooth, rendered in a minutely-detailed (and nausea-inducing) painting (Figure 11.36) which the camera would hold on for an uncomfortably long period. Backgrounds were often just washes of color or even abstract expressionist-style tableaux reminiscent of painter Jackson Pollock (Figure 11.12), much in the vein of the minimalist backgrounds pioneered (and largely since forgotten) in the UPA shorts more than 30 years earlier. The music was a combination of classical standards and nondescript stock mood music (precisely the same library cues used in shows like *Leave it to Beaver* [1957–1963] and *Ozzie and Harriet* in the 1950s). Combine these factors with the subjects taken on in each story (space travel, door-to-door salesman, Hollywood game shows, superheroes), the language used in the spoken dialogue, the color palettes for overall show, and other elements, and *Ren & Stimpy* had a remarkably nostalgic feel to it. Older viewers appreciated the old-school appeal of the show, while the gross-out humor and sometimes disturbing violence (often psychological rather than physical) hooked many younger viewers as well.

Another of the pilots Nickelodeon chose to produce also ended up being even more successful, spawning not only a long-running series but several feature films as well. *Rugrats* was brought to Nickelodeon by Arlene Klasky and Gabor Csupo, whose animation company had been responsible



**FIGURE 11.36** One of many gross moments from *Ren & Stimpy*.

for the studio production of the first three seasons of *The Simpsons*. The series Klasky and Csupo devised showed what daily life was like in a group of households – from the perspectives of the young children and infants who lived in those houses. The babies could all speak to each other (heard by the audience as normal English), but the adults had no idea that the babies were communicating with one another; likewise, the babies could understand what the adults were saying, although their limited knowledge of more “adult” words led to comic misunderstandings and typical childhood encounters with appliances and other modern contrivances. The music for *Rugrats* is much more minimal (originally written by film composer and founding member of the band Devo, Mark Mothersbaugh), mostly played on keyboards; once again, however, the more limited sonic palette was an asset to the show’s format.

MTV, a corporate cousin to Nickelodeon (both were owned by corporate parent company Viacom), also pursued animation, albeit on a different front, producing series that appealed to their target demographic, young adults. While on the surface the gross-out factor and violence of *Ren & Stimpy* would obviously appeal to kids, the show’s writing was decidedly more mature in its approach. Plots dealing with psychological torture, freedom of expression, or social mores came up repeatedly. Perhaps this explains why *Ren & Stimpy* ended up crossing over so successfully from one network to the other, as it was shown in syndication on MTV late nights.

Another series was not simply shown on MTV, but actually incorporated music videos as a part of the show. The characters Beavis and Butt-head were first seen in the short cartoon *Frog Baseball*, which was shown on the network’s *Liquid Television* (1991). The resulting series, *Beavis and Butt-Head* (1993–1997), consisted of two inarticulate, pubescent boys and their musings on school, life, and music videos. Each half-hour episode typically consisted of a story – the boys at school, the boys trying to buy beer, the boys donating sperm – interrupted periodically with segments of the two watching and commenting on music videos, which were shown as part of the segment. (MTV’s deal with artists stipulates that videos can be shown in any format on the station, which would presumably benefit the station and the musicians, even if the boys mocked the performers’ hairstyles and performing abilities.)

Nickelodeon’s gambit – commissioning pilots on which to base potentially successful (or not) series – proved so fruitful that other networks quickly followed suit. In 1994 Cartoon Network (through Hanna-Barbera, which had been purchased by Cartoon Network and was a few years from being absorbed altogether) solicited pilots for a kind of animated variety show, the original idea being that the network would find 48 short cartoons that could be shown in rotation on the series *World Premiere Toons* (later called *What a Cartoon! Show*) The series itself sank quickly, but many of the shorts yielded very promising premises, which became the pilots for even more promising series, including *Dexter’s Laboratory* (1996–), *The PowerPuff Girls* (1998–2004), *Johnny Bravo* (1997–), *Courage the Cowardly Dog* (1999–2002), and *Cow and Chicken* (1997–2001).

The strong elements of design in *Ren & Stimpy* went to another level in shows like Cartoon Network's *The PowerPuff Girls*, created by Craig McCracken (also the creator of *Foster's Home for Imaginary Friends* [2004–]). The house the girls live in is straight out of the 1960s, but then again, many of the plotlines and villains are reminiscent of older comics and cartoons as well, which lends a certain authenticity to the surroundings. Each show also has an off-screen announcer, as in a radio or film serial, another reference to nostalgic forms of entertainment. What is not a nod to the past, however, is the fact that the series focuses on three girls—little girls, at that—which makes the show especially unique. Practically all previous superhero cartoon series had featured men, including those with females (both Wonder Woman and She-Ra had been secondary characters on series dominated by men). *The PowerPuff Girls* is a show about three little girls who, with the superpowers given them by Chemical X, avenge evil all over the city of Townsville.

The reverse of the heavily stylized shows on Cartoon Network appeared in the guise of four boys from outside Denver, CO. Almost immediately after its late summer premiere on Comedy Central, *South Park* (1997–) quickly grew into the most talked-about and controversial series on television, animated or not. The first season dealt with issues including world hunger, obesity, illiteracy, genetic engineering, and anal probes. As the series grew in popularity and infamy, the creators, Matt Stone and Trey Parker, continued to take on more and more controversial issues, constantly pushing the boundaries of what Comedy Central and even basic cable television could endure, such as the episode “It Hits the Fan,” in which the word “shit” is uttered more than 150 times in under 30 minutes.

The long-perceived notion that cartoons were only for kids was therefore dashed in the 1990s, as the most exciting, creative, and original shows were all created with the intention of being shown in time slots not geared to small children—that is, prime time and late night. Many of these shows have cross-generational appeal, much like the Warner Bros. shorts of the 1940s and 1950s. In fact, we can discern many similarities between the cartoons of the 1940s and the 1990s: cross-generational appeal, mass marketing/consumption by all ages, an obvious interest in style and design (including high levels of abstraction), interesting and original use of music, and compelling writing. (This doesn't apply to all output from these periods, of course—for every well-produced short there are a half-dozen slap-together jobs that only serve to sell equally cheap merchandising.)

Shows like *Drawn Together* (2004–), *Family Guy* (1999–2002, 2005–), and *Space Ghost: Coast to Coast* (1994–) show that a genre once designated a youth wasteland has swung decidedly full circle, back to the cursing, garter belt-exposing, tobacco-spitting style of early-sound theatrical releases before Hollywood's Production Code restricted what could be presented on screen. And just like in the 1920s and 1930s, many of these series are inspired by newspaper strips (*The Boondocks* [2005–]); some are spin-offs from other series (*Aqua Teen Hunger Force* [2001–], *Harvey Birdman: Attorney at Law* [2001–], *Sealab 2021* [2001–2005]); and some stand alone as

truly unique (*South Park*). The fact that Cartoon Network has a designated slot in the late evenings in which they feature such programming (called “Adult Swim”) shows just how popular cartoons for adults have become.

In addition to Cartoon Network’s success with original programs, the 1990s also saw new programming developed from old properties – illustrating the enduring appeal of cartoons from 50 years prior. The unexpected success of the 1988 Disney film *Who Framed Roger Rabbit?*, which featured characters from many of the major animation studios of the 1940s and 1950s (Warner Bros., MGM, Disney, Fleischer, Lantz, etc.), showed the potential money to be made from reviving so-called classic characters on television. Warner Bros. studio had the most success in this vein, beginning with *Tiny Toon Adventures* (1990–1992), featuring a new generation of Looney Tunes characters – that is, young versions of Bugs Bunny, Daffy Duck, the Road Runner and Coyote, and many others – but all with their own personalities, not entirely dependant on their mid-century forebears. Several other series followed: *Animaniacs* (1993–1998), which wound the clock back even further, focusing on the species-indeterminate Warner brothers (Yakko and Wakko) and their sister Dot (based on Bosko, the first Warner Bros. cartoon star); a spin-off from this show was *Pinky and the Brain* (1995–1998), about a power-hungry mouse that sounded like Orson Wells and his mentally-challenged partner; *Taz-mania* (1991–1993) featured the young Tasmanian devil from *Tiny Toons Adventures* in his own series. The studio also revived a more serious property in *Batman: The Animated Series* (1992–1995) (following on the success in 1989 of the first in the new *Batman* film franchise), as well as pursuing entirely novel series, such as *Freakazoid!* (1995–1997) and *Histeria!* (1998–2000).

## Summary

Television animation has appeared in many forms, from theatrical cartoons to computer-generated commercials. In this chapter we have focused on the types of narrative cartoons that have appeared on television. We have surveyed the counterbalancing forces of technology, aesthetics, and economics (including production and distribution), which have determined the mode of production of those cartoons. Initially, cartooning evolved a mode of production well-suited for creating films for movie theaters. Cel-and-background animation was coupled with new technologies of sound, color, and rotoscoping, a specialized studio structure, and pre-production planning (using storyboards) to efficiently construct a durable product. Disney, Warner Brothers, MGM, Paramount, and others produced theatrical cartoons during the 1930s, 1940s, and 1950s that would be run and rerun on television up to the present day – once the studios had overcome their fear of television in the late 1950s.

These theatrical films share a general aesthetic of naturalism, which was most aggressively propounded by the Disney studio and now finds expression in photo-realistic computer-generated animation. UPA contested that aesthetic with its abstract animation style: flattened perspec-

tive, abstract backgrounds, primary colors, well-defined character outlines, and limited animation.

The economic advantages of UPA-style animation necessitated its use in made-for-TV animation, which was inaugurated in syndication by *Crusader Rabbit* in 1948 and on prime-time network television by *The Flintstones* in 1960.

Cartoons quickly adapted to television's special demands. Made-for-TV cartoons rely heavily upon limited animation, taming UPA's abstracted style into "radio with pictures." Because the visuals are so simple, dialogue comes to dominate the presentation of narrative, often duplicating what is presented in the image. Television cartoon segments are shorter than theatrical cartoons, to allow for TV's interrupted and segmented form. Some shows use the serial form, posing enigmas to the viewer just before the commercial breaks began. Others are more like live-action series: broken into incomplete segments, but ending with a tentative conclusion. Shows that are compilations of new and old cartoons often use a host to bridge all the elements together.

The template for television animation was formalized by the early 1960s, but underwent significant changes during the 1980s, 1990s and 2000s in its modes of production and distribution and its programming. Developments in computer-generated imagery (CGI) altered fundamental assumptions about how cartoons were made—changing the look of animation as well as its mode of production. CGI may eventually do away with the need for cels themselves. New economic pressures have also driven much animation work overseas and heightened the impact of merchandising. Social pressures have led animators to censor themselves—modifying old cartoons and inserting prosocial discourses into new ones. However, new markets for cable-based cartoon networks and prime-time, adult-oriented cartoons arose in the 1990s—resulting in, among others, the Cartoon Network. And in adult-oriented programs such as *The Simpsons* and *South Park* conservative values are challenged on a regular basis.

## Further Readings

Recent interest in television animation has led to numerous new works. Two reader-friendly books include Allan Neuwirth, *Makin' Toons: Inside the Most Popular Animated TV Shows and Movies* (New York: Allworth Press, 2003), which focuses on shows and films primarily of the last 25 years, and Timothy Burke and Kevin Burke, *Saturday Morning Fever: Growing up with Cartoon Culture* (New York: St. Martin's Griffin, 1999). Edited collections with a more critical and historical viewpoint include Heather Hendershot, ed., *Nickelodeon Nation* (New York: New York University Press, 2004), and Carol A. Stabile and Mark Harrison, eds., *Prime Time Animation: Television Animation and American Culture* (New York: Routledge, 2003).

Meanwhile, books on *The Simpsons* have become a cottage industry, including John Alberti, *Leaving Springfield: The Simpsons and the Possibility of Oppositional Culture* (Detroit: Wayne State University Press, 2003); Steven

Keslowitz, *The Simpsons and Society: An Analysis Of Our Favorite Family And Its Influence In Contemporary Society* (Tucson, AZ: Hats Off Books, 2004); Chris Turner, *Planet Simpson, How a Cartoon Masterpiece Defined a Generation* (Cambridge, MA: Da Capo, 2004).

Hal Erickson, *Television Cartoon Shows: An Illustrated Encyclopedia, 1949 through 1993* (Jefferson, NC and London: McFarland & Company, Inc., 1995) is a thorough and highly informative two-volume set. George W. Woolery, *Children's Television, the First Thirty-Five Years: 1946–1981* (Metuchen, NJ: Scarecrow, 1985), is a broad-based history of all children's programming, paying particular attention to cartoons.

Little else has been written specifically on the television cartoon. However, Charles Solomon, *Enchanted Drawings: The History of Animation* (New York: Knopf, 1989), does offer a well-illustrated chapter on the topic. Similarly, Leonard Maltin, *Of Mice and Magic: A History of American Animated Cartoons* (New York: New American Library, 1980), chronicles the advent of the TV cartoon after detailing the history of the theatrical cartoon. Solomon's and Maltin's approaches are historical, and offer rudimentary critical analysis of the cartoons.

Margaret Morse, *Virtualities: Television, Media Art, and Cyberculture* examines many of the theoretical implications of CGI and its impact on television. However, the best resources for computer-based animation are on the Web—including sample images and animations. The addresses for these resources change quickly, however, and so we have placed them on Television's companion Web site where they may be easily updated. Please see [www.TVCrit.com](http://www.TVCrit.com) for further information.

The two most thorough surveys of Hollywood theatrical animation are Michael Barrier, *Hollywood Cartoons: American Animation In Its Golden Age* (New York: Oxford University Press, 1999). Like television cartoons, there are several books that engage in a rigorous critical and/or cultural interpretations of theatrical cartoons. These include Donald Crafton, *Before Mickey: The Animated Film, 1899–1928* (Cambridge, MA: MIT Press, 1982); Eric Smoodin, *Animating Culture: Hollywood Cartoons from the Sound Era* (New Brunswick, NJ: Rutgers University Press, 1993); Paul Wells, *Animation and America* (New Brunswick, NJ: Rutgers University Press, 2002); and edited anthologies including Kevin Sandler, ed., *Reading the Rabbit: Explorations in Warner Bros. Animation* (New Brunswick, New Jersey: Rutgers University Press, 1998); and Eric Smoodin, ed., *Disney Discourse: Producing the Magic Kingdom* (New York: Routledge, 1994).

## Notes

1. The speed of silent film was originally around 16 frames per second (f.p.s.), though by the 1920s it was above 20 f.p.s. The cameras were cranked by hand at that time and the speed varied considerably. Once sound arrived the speed was standardized at 24 f.p.s.

2. In both devices, one looks through slits to see drawings while the device turns. One views these individual drawings in quick succession,

which leads the human perceptual system to translate the still images into motion pictures. The exact process is not fully understood, but it's thought that the phenomena of critical flicker fusion and apparent motion are what cause the illusion of movement. For more information, see David Bordwell and Kristin Thompson, *Film Art*, 6th ed. (New York: McGraw-Hill, 2000), pp. 2-3.

3. Disneyland was opened in 1955. Disney's television program has been known variously as *Disneyland*, *Walt Disney Presents*, *Walt Disney's Wonderful World of Color*, *The Wonderful World of Disney*, *Disney's Wonderful World*, and *Walt Disney*. It was broadcast for 29 years on ABC, CBS and NBC; and is second only to *The Tonight Show* in longevity. The Disney cable channel was launched in 1983.

4. Linda J. Obalil, "Steamboat Willie," *The International Dictionary of Films and Filmmakers: Films*, edited by Christopher Lyon (New York: Perigee, 1984), 451.

5. *Minnie the Moocher*, *Snow White*, and *I'll Be Glad When You're Dead You Rascal You* are in public domain and are available for free download on archive.org (accessed 22 July 2006): [www.archive.org/details/bb\\_minnie\\_the\\_moocher](http://www.archive.org/details/bb_minnie_the_moocher), [www.archive.org/details/bb\\_snow\\_white](http://www.archive.org/details/bb_snow_white), and [www.archive.org/details/bb\\_ill\\_be\\_glad\\_when\\_youre\\_dead](http://www.archive.org/details/bb_ill_be_glad_when_youre_dead).

6. The multiplane camera was still another of Disney's technological devices that was meant to increase naturalism. However, it had little impact on most cartooning of the 1930s.

7. The U.S. Supreme Court ruled on the "Paramount Case" in 1948 and ordered the divorcement of the studios' exhibition operation from their production and distribution divisions. Studios were no longer permitted to own theaters and had to compete with independent producers to get their films shown.

8. To be accurate, some of the early Terrytoons were released to television before CBS's acquisition of Paul Terry's Studio in 1955. They had been seen on the network weekday afternoon program *Barker Bill's Cartoon Show* (1953-56).

9. George W. Woolery, *Children's Television, the First Thirty-Five Years: 1946-1981* (Metuchen, NJ: Scarecrow, 1985), 74-75.

10. As cited in Mark J. Wolf, "Crusader Rabbit and the Adaptation of Animation to Television," unpublished essay, 1991.

11. Rogier van Bakel, "Before *Toy Story* There Was . . . *ReBoot*," *Wired* 5.3 March 1997, 27 January 2006, [www.wired.com/wired/archive/5.03/reboot.html](http://www.wired.com/wired/archive/5.03/reboot.html).



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