

## 9. Implications of the Cel Animation Technique

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from *The Cinematic Apparatus*, de Lauretis and Heath ed., 1980

### I. INTRODUCTION

If technology were the only factor determining the creation of motion pictures, animated films would logically share a prominence equal to that of live-action films in the history of the cinema. Certainly the optical toys generally credited with having led up to the invention of the *cinématographe*, were more often dependent upon drawings than photographs. Emile Reynaud's Praxinoscope projected a moving strip of images onto a screen for a paying audience in 1892, three years before the Lumière première; his strips were hand-drawn, did not repeat in cycles as the zoetrope bands did, and lasted for several minutes each. Photographed onto modern film stock, they can still be shown as animated cartoons. (After the invention of the *cinématographe*, however, Reynaud did not adapt his method by photographing the drawings onto a strip of film).

Technologically, then, the animated cartoon was possible as soon as cinema itself existed in any form. In historical fact, early film-makers attempted animated films only as isolated experiments. J. Stuart Blackton's *Humorous Phases of Funny Faces*, often credited as the first regularly distributed cartoon, was made more than ten years after the Lumière première, in 1906. Emile Cohl, Winsor McCay and others made animated films, but, popular though these may have been, they did not succeed in rivalling live-action films; they did not, that is, establish cartoons as a *regular* part of the motion picture programmes of the pre-feature film era.

Indeed, there seems to have been no real concept of the animated film as a distinct mode for many years. The term 'animated film' meant not just cartoons but any motion picture film (as in Cecil

Hepworth's 1897 title, *Animated Photography*). As late as 1912, Frederick A. Talbot makes cartoons a mere subset of his lengthy section on 'trick films' in *Moving Pictures; How They Are Made and Worked*.<sup>1</sup> Animation, then, constituted a minor aspect of special effects; quite possibly the majority of audience members at this period had never seen a cartoon. By 1920, however, E. G. Lutz is able to write a whole book on animation and entitle it *Animated Cartoons*.<sup>2</sup> At some point in the intervening eight years, animation had become recognised as a distinct type of film-making.

One probable reason why cartoon film production lagged so far behind the invention of its technology is expense. The technique of drawn photographed frames typically costs more and takes longer than photographed live action. The Lumière brothers could photograph, develop and project a film, all within a single day. An animated cartoon of a similar length would have required several week's work at that time. This has remained true ever since. Not all live-action films are cheaper than animated ones, of course, but animated films have tended to cost more.

It is difficult to determine when critics, historians and audiences began to recognise animated cartoons as a distinct mode. By about 1913, these films started to show up fairly regularly on theatre programmes. Even so, they might have remained an occasional novelty were it not for the invention of celluloid, or 'cel', animation, by Earl Hurd and John Bray, which combined several recently-developed techniques and was itself patented in 1915.

Cel animation consists of separating portions of a drawing onto different layers to eliminate the necessity for re-drawing the entire composition for each movement phase. In the mid-teens, Raoul Barré developed the method for the actual separation of the picture parts with his 'slash' system, whereby a drawing of an entire character could be cut apart and traced onto separate cels.<sup>3</sup> Thus, using the slash system, the background might be on paper at the lowest level, the characters' trunks on one sheet of clear celluloid and the moving mouths, arms and other parts on a top cel. For speech and gestures, only the top cel need be re-drawn, while the background and lower cel are simply re-photographed.

This technique not only saves labour time for a single artist, but it also allows specialisation of labour. That is, one person may do the background, while another does certain main poses of the character, and yet another fills in the phases between these major poses. In fact, the animation industry has followed this pattern, with key anim-

ators (doing the major poses), 'in-betweeners', and 'opaquers' (filling in the figures with opaque paint) in addition to those performing the specialised tasks of scripting and planning. The specialisation process and the establishment of the first production companies for animated films took place from about 1915–17 — at the same time as the establishment of the Hollywood motion picture production system in general (also characterised by greater and greater specialisation of tasks — the 'factory' system).

Thus cel animation originated within the industry of a single country, the USA, and that country was in the process (during World War I) of becoming the leading production force in world cinema. Partly as a result, the cel technique quickly became defined within relatively narrow boundaries. These boundaries had as much to do with the developing Hollywood conception of the animated film as with the actual technical properties of the mode. Hollywood defined the cartoon by its difference from live-action films and it has remained a secondary form ever since. One symptom of this subsidiary position has been its short length; another is its position as a prelude to the feature on most programmes. Hollywood's conception of cel animation has, I shall argue, been developed partly as a defence against the disruptive properties of animation. By trivialising animation, Hollywood has made it compatible with the classical cinema as a whole, making it appeal to the same audience viewing habits.

## II. THE IDEOLOGY OF HOLLYWOOD CEL ANIMATION

As Stephen Heath points out in the opening essay in this volume, early cinema was sold as a novelty based upon a machine. The programmes of short films did not depend upon the viewer's ability to differentiate films from each other beyond the title (to avoid the repeated viewing which negates the notion of novelty). Only after about a decade does this dependence primarily upon novelty as an attraction seem to have declined. During the period 1907–12, the cinema as a commercial institution developed strategies for drawing spectators to specific films: the star system, the dominance of the story, the companies' trademarks, genres and the use of elaborate spectacle. Films were now familiar enough that the novelty of the machine had become naturalised through familiarity. An ideology of the realism of depicted events had taken over.

Perhaps it is not coincidental that the decline of the novelty effect in live-action films coincided historically with the commercial beginnings of animation. These animated films echoed what had appealed to the spectator of more than a decade earlier: they appeared as novelties. As with live-action, the cartoons were also promoted as products of a mechanical process. Many of the early cartoons contained references to their unique mode of production. In Emile Cohl's films, a live-action hand occasionally enters the frame to manipulate the figures. Winsor McCay appears in live-action frame segments of both *Little Nemo* and *Gertie the Dinosaur*, where he makes bets with sceptics that he can make drawings move. In *Little Nemo* there follow scenes of McCay at work, surrounded by huge stacks of paper and barrels of ink. (His other films sometimes contain written prologues describing the laborious process which has produced the moving drawings). John Bray's first film, *The Artist's Dream* (1913), contains a similar live-action frame which motivates the animated portion as a dream. Other examples include the Fleischer brothers' 'Out of the Inkwell' series. References to the animation process are also a common device in later cartoons, such as *Duck Amuck* (1953).

For the film industry, the idea of films as magical, extraordinary things is valuable. This is evidenced by the continuous reference to Hollywood as 'the dream factory' (often by people within the industry). Clearly Hollywood does not want people to take movies too much for granted. As an institution, its strategy has always been largely to mystify the process of film-making. (Even when film-making appears in Hollywood films, the depiction inevitably opts for glamour and mystery rather than technological accuracy).

This conflict between the impulse towards naturalisation of films on the one hand and the desire to retain their novelty effect on the other confers a considerable value upon the animated film. The early cartoons place great emphasis on the marvel of mechanically reproduced movement; *Little Nemo* presents nothing beyond the characters' display of their own ability to move. Within a few years after their appearance, cartoons had become a regular part of motion picture programmes (usually as a split reel along with a newsreel). The juxtaposition with live-action films provided a constant reminder of the mechanical magic of the motion picture apparatus. (Note that programmes made up entirely of cartoon shorts were never part of Hollywood's appeal to the audience; only much later did this become an accepted practice and then only in

Europe). Cartoons also imitated live-action films, in that they quickly came to depend on stars (often derived from popular comic strips) and narrative. But always there remained the emphasis on the mechanics of production. Virtually everything written on animated films throughout their history has concentrated on the 'how-to' aspects. This contrasts with the writing done on live-action films, which is less concerned with the minutiae of technique. (One exception to this generalisation exists—the special effects film, which relates closely to, and sometimes depends upon, animation; here, too, the emphasis is often upon 'magic', as with the inevitable references to the special effects 'wizard').

During the late teens, twenties, and up into the fifties, film-makers and audiences maintained this ideological view of animation's difference; animation could do things live-action could not, and hence it came to be assumed that it *should* do only these things. As a result, cartoons did not opt for the naturalism of imitating live-action films. (Disney's impulse towards realism, described by Richard Schickel,<sup>4</sup> occurs mainly in his feature films, which are much closer to live-action features than are his shorts of the same period). Instead, cartoon production was broadly stylized, usually in imitation of comic strips; it used caricature, stretchiness and flatness in general defiance of the laws of nature. These are all familiar aspects of animation. Hence, only certain types of narratives were considered appropriate to the animated medium: all cartoons were supposed to be comic. Possibly this view originated partly from the fact that virtually all the animators of the silent period came into the business from being newspaper comic strip artists (Disney, coming from commercial art, was the first major exception). Also, comedy has traditionally been a mode which motivates extreme departures from canons of verisimilitude (as when Groucho advises the audience to go out to the lobby during a musical interlude in *Horse Feathers*). Since comedy so easily permitted the stylization thought 'natural' to the animated film, an ideological view of cartoons as comic developed.

Along with comedy, animated film narratives frequently drew upon fantasy, magic and traditional stories as a motivation for stylization. This encouraged an assumption that cartoons were for children, since they resembled narrative forms traditionally associated with children. For many years they appeared on programmes aimed at a 'family' audience and were sometimes constructed on several levels of humour to keep all ages entertained.

But a family audience is basically defined by the presence of children. As soon as films responded to television by in themselves aiming at specialised age groups, the animated cartoon declined as a regular part of theatre programmes.

The ultimate ideological result of the assumption that cartoons are for children was a trivialisation of the medium. The Hollywood ideology viewed cartoons as a minor subset of the cinema as a whole. Other genres—the documentary, experimental films and live action—have remained more prestigious to the present day; symptomatically, these other types are probably more frequently taught as separate college courses than is animation.

In sum, the ideology of Hollywood cel animation for many years was that cartoons are secondary to live action, virtually always comic and/or fanciful, for children and trivial. Such films were valuable for Hollywood because they brought the mystery of movie technology to the fore, impressing people with the 'magic' of cinema. Animation made cinema a perpetual novelty.

This situation seems to have lasted until the serious incursions into the market made by television in the fifties. In the mid-fifties television started buying libraries of old cartoons and then commissioning new films to be produced specifically as television series. Television at last revealed the implicit ideology of animation as a trivial children's form by putting its shows on at after-school hours, on Saturday mornings and in the early evening dinner hour. Now the large majority of the audience was children, with parents only occasionally watching along (most notably for the early syndicated Hanna-Barbera evening series and the later specials). Adults no longer see animated films on a regular basis and subsequent attempts to develop animated films specifically for an adult movie audience have been only sporadically successful.

Thus with the popularisation of television, animation from Hollywood has largely ceased to serve its traditional ideological function; it has indeed ceased to be a major force in American theatrical film-making. In a sense, the current trend towards special effects films (for example *Star Wars*, *Close Encounters of the Third Kind*) may be replacing it in that function. Audiences have gained a new orientation towards the mysterious, complex process of film-making, as promoted by articles in popular magazines. Interest in the cinema as a technical marvel has again been renewed, to Hollywood's greater financial advantage.

The Hollywood conception of the animated film has been

remarkably successful. Critics and theorists have largely avoided the subject, implicitly accepting the view of the cartoon as trivial. Those who do treat the animated film as an important form have often done so by comparing certain films with other, culturally accepted art forms; a UPA cartoon is seen as being like a Picasso or Modigliani painting.<sup>5</sup> Foreign and independent American film-makers who have attempted to create an alternative view of the animated film as a non-trivial mode have been only minimally successful. Frequently they have rejected cel animation as already ideologically tainted, due mainly to its typical subject matter. Alexandre Alexeieff and Claire Parker created their pinboard specifically because, as Alexeieff said, 'I considered the animated cartoon good for comics, not for the poetic atmosphere which was the life-substance of my engravings.'<sup>6</sup> Prior to the advent of television many of the most famous foreign animators worked in alternative forms such as puppet and silhouette animation. This tactic has allowed them to escape somewhat the stigma of the trivial cel cartoon. In order to receive serious attention, an animated film often needs to slide over into the more respectable classification of the 'experimental' film, as with John Whitney's computer work.

### III. STRETCH AND SQUASH

'We use a great deal of perspective.'

Chuck Jones<sup>7</sup>

Although the Hollywood view of cel animation has been historically prevalent, some film-makers have approached the mode in entirely different ways. Indeed, I would argue that the cel technique has several unique features which would tend to promote formal play of a potentially disruptive kind. Hollywood film-making has largely recuperated these features by subordinating them to its ideological purposes.

Cel animation creates space in a manner more like the traditional graphic arts than live-action film-making. Animation uses the same depth cues (size, partial overlap, attached shadows, cast shadows, aerial perspective, detail perspective, texture gradient, linear perspective, colour, filled vs unfilled space and blurring of close objects<sup>8</sup>) and perspective systems as in painting or drawing; it also can add the depth cue of motion (temporal parallax — the shifting

of picture planes at different rates according to their real or apparent distance).

The crucial aspect of cel animation is its separation of the different foreground and background layers. Typically, the background layer(s) remains constant throughout a shot, while the cels for the moving figures must be frequently redrawn. This difference in the amount of work involved in the background and foreground tends to promote a split between the types of depth cues used in the separate layers. For the artist, the addition of more elaborate depth cues is easier in the backgrounds than in the figures themselves. Particularly in the cartoons of Disney, the Fleischer brothers, and Warner Bros, backgrounds tend to contain depth cues like attached and cast shadows, linear perspective, detail perspective, and occasionally even aerial perspective (the latter is apparent, for example, in Disney's *Silly Symphony Flowers and Trees* or in Clampett's *Bugs Bunny Gets the Boid*). The moving figures rely on far simpler cues like size, colour and overlap. It would be relatively difficult for animators and opaquers to match attached shadows on the figures from shot to shot. (Even Disney's remarkable technical skill is not always up to it; in *Pinocchio*'s scene of Gepetto going to bed, the highlight and shadow on his hair flicker from frame to frame).

In practice, this visual difference between backgrounds and figures has led to a considerable mixing of whole perspective systems within single films. The flat representation of space used in cel animation (except for Disney's multi-plane camera or the short-lived 3-D effort) means that the film is not dependent upon the lens for its formation of perspective, as live action is. Hence the same composition may contain elements rendered in a linear perspective system, while other elements employ an isometric system. The frame illustration (Plate 1) from an early Merrie Melody, *Smile, Darn Ya, Smile* (1931, Hugh Harman-Rudolf Ising) contains a crude example of the potential conflict of perspective systems; here the streetcar appears in an unsteady cross between linear and isometric perspective, sitting on a track done with a distinct linear vanishing point: the car appears to be askew on the tracks. Other shots of the tracks straight-on indicate that the tracks' ties are supposed to be parallel and fairly close together.

In this case, the mixture results from the crudeness of the drawing. But much of the perspective mixture and distortion of cel animation comes from specific strategies animators have worked out

to deal with the special features of the mode. Animators have developed two terms—'stretch' and 'squash'—to describe the distortions of characters' figures which occur in time; a character being hit might stretch, while one dropped from a height would squash upon striking the ground. In spite of the character distortion, the backgrounds and other figures remain unchanged, which produces a further conflict between perspective systems. The figure in such cases is rendered in a system somewhat analogous to anamorphic perspective. Traditional anamorphic art-works typically attempt to force the viewer to move to a precise spot from which the picture appears relatively undistorted. In cartoons the viewer does not move; instead, the distortion usually has a narrative motivation. In the frame (Plate 2) from the Warner Bros film *Draftee Daffy* (Robert Clampett, 1943), the character's head is squashed. The narrative situation has him reacting as he watches Daffy's off-screen fall to earth after a bomb blast; the violence is displaced onto the figure of the man and thus motivates the use of squash. Not every instance of squash has a narrative motivation, however. McCay's *Little Nemo* includes a brief segment (Plate 3) in which Nemo stands bowing in the centre, presenting his two friends at either side, who stretch up and squash down rhythmically. Here showing off the novelty of the cartoon mode provides the only excuse for the device.

In addition to utilising the depth cues and perspective systems of the traditional graphic arts, cel animation has developed its own perspective peculiarities, resulting from the demands of the medium. Camera movements have to be simulated frame-by-frame in most cases. A track in any direction is relatively simple; a lengthening of the background provides the space necessary to allow the camera's apparent shift. But a pan presents greater difficulties. Were the camera simply to swivel, as in live-action, the background would become increasingly slanted away from the lens. Hence apparent 'pans' must be handled as tracks, with the camera moving without swivelling. The appearance of a pan arises from false perspective cues. The centre of the pan must be rendered as the largest portion, with two vanishing points, one at either end of the pan. The resulting background drawing is like linear perspective turned inside out, with its centre protruding rather than receding. Chuck Jones is particularly adept at this, using numerous pans up and down buildings, or around the interiors of rooms. Plate 4 is a composite, showing several stages of a tilt-up from *Hare Conditioned*

(1945) assembled into an approximation of the original background drawing. On the screen, the distortion tends to disappear, since only small portions of the drawing are visible at any one time; the result is often a remarkably good simulation of a pan. Nevertheless, the false perspective used in 'pans' can be seen during screening by anyone aware of its presence.

Finally, cartoon drawings sometimes use or imitate perspective cues of live-action filming. Cutting into a space may establish spatial relations, and cartoons use analytical editing in a way similar to live-action. They also can imitate the effects of different lens lengths; some backgrounds incorporate the curving, distorted appearance of near objects characteristic of a wide-angle lens. Jones's *The Aristo-cat* (1943) has a sequence in a library where the shelves curve upward toward the foreground; the cat in this scene diminishes rapidly in size as he backs into a corner. Overhead shots of buildings also occasionally create concave lines flaring out toward the top to imitate the wide-angle lens effect.

Cartoons handle temporal relations in a necessarily conventional way. In live-action, action usually occurs in 'real time' (a term in animation indicating any footage shot and projected at the same rate); there is a reasonably clear distinction between this standard speed, slow or fast motion, and freeze-frames. But speed in the animated film involves something closer to a continuum. The difficulty of re-drawing every frame leads to short-cuts which affect temporal relations. Full animation usually uses exactly the same composition for two successive frames; only a high-budget film or a very fast movement will use change at every frame. This is not detectable in a screening, but already the rhythm of movement tends to differ from live-action.

Cel animation encourages the use of freezes for portions of a scene not involved in the action. One absolutely static figure may stand next to a frantically moving one. Even when both figures are moving, the difference between frames on one can be increased greatly to render the illusion of speed, while the other figure could be done with very small changes, resulting in slowness. Again, this contrast of speeds tends to differentiate animation from live-action.

But speed in the animated cartoon does not depend only on the amount of change between cels. Hollywood animators have developed a whole set of conventions for signifying speed, quite apart from the actual speed of the figures' motion. As far as I have been able to determine, there are no general names for these

conventions as there are for spatial distortion; they are, however, the temporal equivalents of stretch and squash in spatial relations.

In 'squashing' time, the animator reduces the apparent time of an action, often by using a conventional speed indicator. For example, a character's move across a room might be rendered with the figure as simply a streak of paint; a similarly fast track across the background may reinforce the illusion of an action so fast it becomes a blur. Chuck Jones uses this method quite often; a streak of paint with several sets of eyes may constitute the entire figure in a couple of successive frames — the movement across a room occupying only these two frames. (No strictly comparable effect is possible in live-action, since a pan or track exactly with the moving character would render only the background plane as a blur).

A rare device of superimposed image occurs in Jones's *Conrad the Sailor* (1941). As Daffy runs into the frame and stops suddenly, his figure appears as several superimposed Daffies, which run in separately and join together to form a single, solid Daffy (Plate 5). This device, unusual though it is, demonstrates that signifiers for speed need not themselves occur quickly. The joining-up of the multiple Daffies takes longer than a single figure running quickly into the frame would. Animators could devise any number of similar techniques with each being a purely conventional signal for speed.

Metaphors provide another type of speed signal. In *Draftee Daffy*, Daffy's runs through the house seem to become faster and faster, as his body changes into a lightning bolt and a shower of sparks. Here the figure remains virtually static in the frame, while the backgrounds move quickly behind it. Again, the conventional signal suggests a speed which is not actually there in the figure itself.

One of the most interesting speed indicators involves the use of multiple figures of the same character. This tends to occur in very fast actions; Robert Clampett often uses this method as an alternative to Jones's blurs of paint. In such a scene, the images of the character multiply in the frame, often combining with stretch effects. Sometimes the character may grow extra hands, feet or heads. The illustration from *Draftee Daffy* (Plate 6) shows a frame with at least five Daffies running in various directions. Clampett has even been able to suggest this frantic movement without having the multiple, black Daffies merge into each other: he makes two of the figures lavender-coloured, to separate the Daffies visually. This device depends partly on the assumption that the audience will perceive the action indistinctly in projection. Yet once we know

they are present, they become quite easy to spot; the purple Daffies are apparent in *Draftee Daffy*, even at 24 frames per second. But invisibility is not entirely necessary. The multiplication of characters or their limbs is a familiar convention of comic strip art as well; there it is entirely visible to the perceiver.

Other conventional devices indicate 'stretched' time, in addition to the obvious approach of using little change between frames. Cartoons offer considerable potential for prolonging an event. This does not necessitate overlapping editing of the Eisensteinian variety, since movement can occur before backgrounds which extend for any distance. We have all seen cartoons in which characters move through rooms that appear to be miles long, as the same background drawing is run through again and again; the characters repeatedly pass the same lamps and doorways. This prolongation results simply from identical repetition within a single action. A similar effect often occurs in figure movement; the literal re-use of the same set of cels (for example, for walking, waving arms, laughing gestures) is called a 'cycle'. An action in cycles may take place at a relatively fast pace, but the repetition will make the entire action last longer. A cartoon may also prolong action by having a character move through a series of different backgrounds during the execution of a single basic action; this happens especially in scenes of lengthy falls. Clampett's *Falling Hare* (1943) ends with the extremely prolonged fall of an aeroplane.

Cartoons stretch time in another, simpler way by introducing freezes — the repeated photographing of the same composition. Tiny freezes are virtually inevitable in cel animation. They can be brief, as with Daffy's annoyed glances out in *Duck Amuck*, or quite lengthy. Generally the freeze is less noticeable in cartoons than in live action, since the device appears so frequently; as Norman McLaren has pointed out, for most animation techniques, including cel, 'the static image is the easiest footage to obtain, and the mobile the most difficult.'<sup>9</sup> These freezes do not typically signify a break in the temporal flow (as is frequently the case in live-action freezes); rather, they slow it down.

Another method for slowing down action resembles freezing: individual portions of the character move in turn while the others remain frozen. Quite often, when the Coyote falls off a cliff, his movement out of the frame begins with his legs, which then stretch to permit his body to remain suspended in space; the body then leaves, with the neck stretching, and finally the head follows. The

slash system of doing cels makes this temporal segmentation possible.

All these devices of spatial and temporal construction offer the cel film a great potential for disruption of expectations. The separation of elements onto different levels allows the artist complete control over each, plus the possibility of creating contradictions. Like Escher's engravings, cartoons could systematically build an impossible space as a locale for narrative action. (Systematically, that is, as opposed to the *Smile, Darn Ya, Smile* frame, which mixes perspective systems through simple miscalculation). The same would be true for time.

Jones's *Duck Amuck*, for example, systematically undermines the depth cues of the background layer. First, Daffy moves past a background with multiple depth cues. Within the same shot, the colour disappears, followed by the outlines, to leave a white void behind Daffy (Plate 7). As he moves along, farm settings merge into arctic ice fields, and so on, all without a cut. To a certain extent, this contradictory space is matched by contradictory time. When the image becomes apparently mis-framed, the Daffy of the lower half climbs up to confront the Daffy of the 'previous' frame. The two images which have served to create successive movements join on a single frame of film. A few other films have used isolated devices of this sort. Some employ the *Persona* trick of apparently breaking the film (for example the Fleischers' *Boonland* (1938) and Jones's *Rabbit Punch* (1947)). But *Duck Amuck* is perhaps the furthest a Hollywood film has gone in utilising the technique of cel animation to undermine conventional cartoon structures.

#### IV. CONCLUSIONS

This study's implications for the Hollywood cinema go beyond the animated films themselves. We have seen how cartoons use some devices which are potentially very disruptive (for example, mixtures of perspective systems, anti-naturalistic speed cues). As we might expect within the classical Hollywood system, however, narrative and comic motivations smooth over these disruptions. Even a film as radical in its devices as *Duck Amuck* remains quite readable to an audience accustomed to watching Daffy in his more characteristic films. As always, film techniques and technology are not in themselves radical; they become so only when used within the structure of a complete film.

A counter-example to the Hollywood cinema would be an animated film such as Robert Breer's *Fuji* (1974). Breer has taken one of the (apparently) least daring and flexible devices of cel animation, the rotoscope.<sup>10</sup> The bulk of the film consists of crude rotoscoped outlines of human figures and the landscapes of Mt Fuji, with flickering washes of changing solid colors. Yet Breer juxtaposes this footage with the original live-action footage used for the rotoscoping and even in some places traces directly around the figures in the live-action images. The images repeat and vary with no narrative progression.

The mixture of live action and cel animation is nothing new; Hollywood has often used this technique. But Breer's use of the rotoscoping to combine shaky, dim images with crude tracings goes against the entire Hollywood ideology of technical smoothness, the mystification of the novelty of movement and the use of animated films for comic, trivial narratives. Breer's images go frame by frame, but the change is so great that the illusion of movement occasionally almost disappears, to be replaced by an effect that approaches a flicker technique. In spite of *Fuji*'s neutral subject matter, it is a quite radical cel film, because it uses a system of devices that opposes the ideology of the classical Hollywood cartoon.

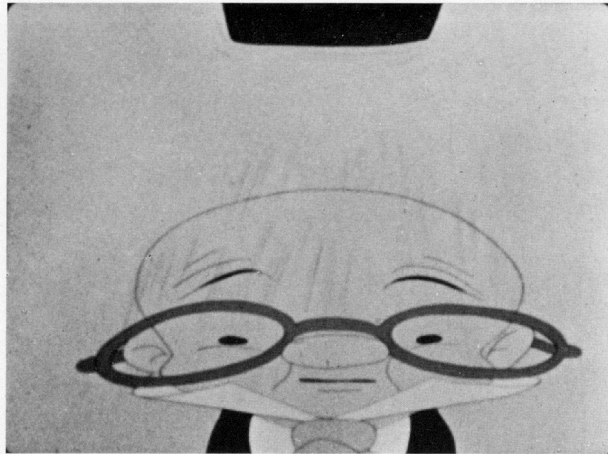
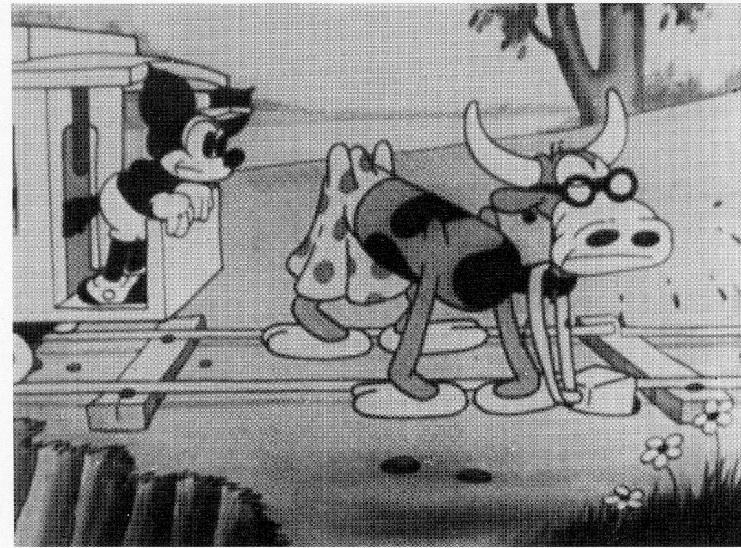
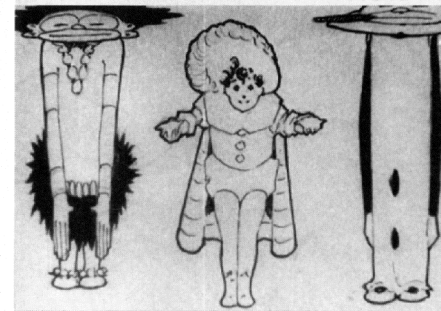
Recent study of the live-action film has demonstrated that a large middle ground lies between the avant-garde and the historically dominant classical Hollywood system. Without eschewing narrative structures, film-makers like Bresson, Ozu, Tati, Eisenstein and many others have created alternative formal approaches. In animation, this middle ground has historically consisted primarily of film-makers (for example, Alexeieff and Parker, Lotte Reiniger, Ladislav Starevitch, Oskar Fischinger) working in non-cel modes. Relatively few cel cartoons have been made using alternative approaches comparable to those in live action.

The fact that cel animation lends itself so readily to disruptive formal strategies suggests one reason why the conservative Hollywood ideology of cartoons developed as it did (making it difficult to break away from its system without going to an opposite extreme). Since disruption unmotivated by narrative is unwelcome in the classical system, Hollywood needed to tame the technology. Trivialisation provided the means. While the classical Hollywood system as a whole may have been a relatively limited definition of cinema, the animated films made within that system had even narrower boundaries.

## NOTES

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1. Frederick A. Talbot, *Moving Pictures, How They Are Made and Worked* (Philadelphia: J. B. Lippincott Company, 1912).
2. E. G. Lutz, *Animated Cartoons* (New York: Charles Scribner's Sons, 1920).
3. This and other information about the early invention of animated films from Nat Falk, *How To Make Animated Cartoons* (New York: Foundation Books, 1941), pp. 17-18.
4. Richard Schickel, *The Disney Version* (New York: Avon, 1968).
5. See title pages, Robert Benayoun, *Le Dessin animé après Walt Disney* (Paris: Jean-Jacques Pauvert, 1961). UPA (United Productions of America) was set up in the 1940s by a breakaway group of animators from the Disney Studios and developed a distinctive and highly influential style, usually described in such terms as 'economical vivacity', 'spare elegance' and so on.
6. Robert Russett and Cecile Starr (eds), *Experimental Animation* (New York: Van Nostrand Reinhold Company, 1976), p. 92.
7. Mike Barrier, 'An Interview with Chuck Jones', *Funnyworld* no. 13 (Spring 1971), p. 6.
8. As listed in Daniel J. Weintraub and Edward L. Walker, *Perception* (California: Brooks/Cole Publishing Co., 1966), pp. 22-9.
9. Russett and Starr, *op. cit.*, p. 123.
10. A rotscope is a projection device which allows the film-maker to trace, frame by frame, live-action footage.

PLATE 2 *Draftee Daffy*PLATE 1 *Smile, Darn Ya, Smile*Plate 3 *Little Nemo*



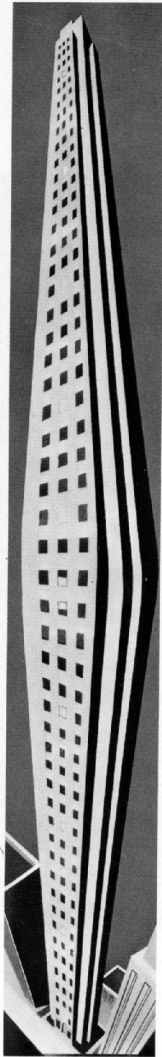


PLATE 4 *Hare Conditioned*

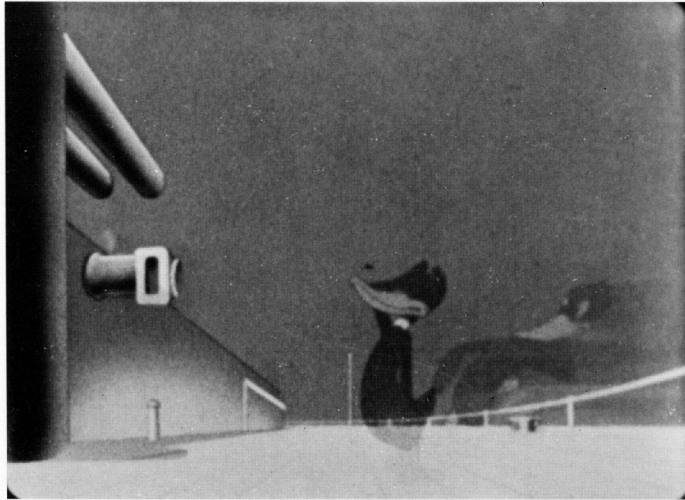


PLATE 5 *Conrad the Sailor*

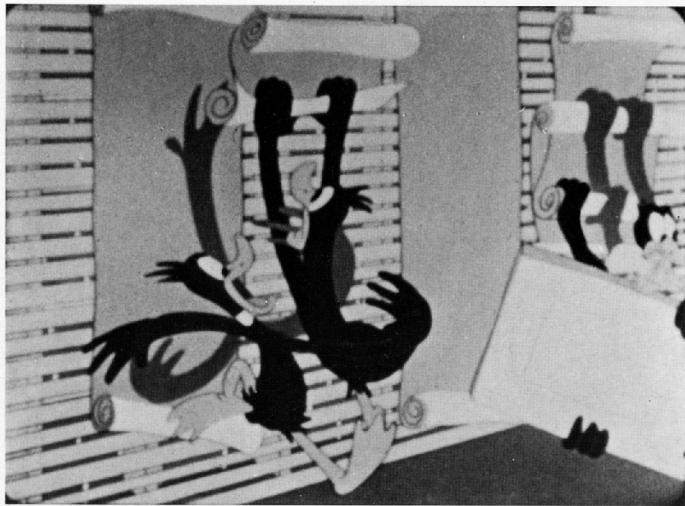


PLATE 6 *Draftee Daffy*

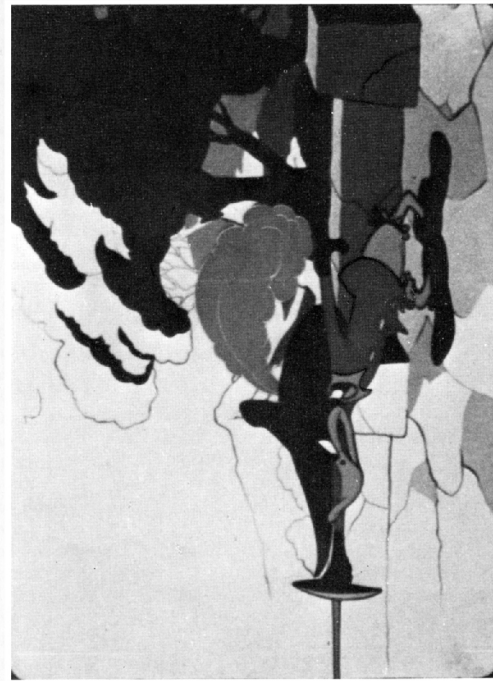


PLATE 7 *Duck Amuck*