INTRODUCTION

‘Seeing the brick’

He did several studies of the street car and when he held them together and flipped the pages it appeared as if the street car came down from the tracks from a distance and stopped so that the people could get on and off. His own delight matched the girl's. She gazed at him with such serene approval that he had a fever to create for her. He bought some more scrap paper. He imagined her on ice skates. In two nights he made one hundred and twenty silhouettes on pages not bigger than his hand. He bound them with string. She held the little book and governed the pages with her thumb and watched herself skating away and skating back, gliding into a figure eight, returning, pirouetting, and making a lovely bow to her audience.

(Doctorow, 1976: 95)

Humankind has always been fascinated by moving images. The desire to make pictures move has provoked some of the most innovative developments in the fields of Science and Technology during the twentieth century. Curiously though, it is this very fact which has inhibited a proper recognition of the animated film and animation as an art form. The profound pleasure, recorded here by novelist, E.L. Doctorow, in the construction and use of an animated ‘flip’ book, recognises the relationship between the artist and the actual creation of movement that so intrinsically informs the art of animation, an art that precedes its recording on film. Doctorow stresses the appeal of making images apparently move – the ‘fever to create’ which underpins the work of all animators.

‘Animation’, in this sense – the skill of animating images by hand, ‘frame-by-frame’ – became only one of the approaches by which pioneering film-makers tried to create and record moving images. The driving imperatives of the pioneers were largely technological in that they were testing the capability of a new medium in a mechanistic rather than aesthetic way. The development of the camera was more important than the things it photographed (though these things became important both to film-makers and historians as the medium progressed). Consequently, the techniques of photography, and the skills of the photographer subsumed the art and craft of animation and surpassed the early
achieved by the animator. Pre-cinematic achievements in animation will be addressed in Chapter One, but particularly significant was the work of French professor, Emile Reynaud, who invented the Praxinoscope:

It consisted of a cylindrical box attached to a pivot. A coloured strip of paper on the inside face of the cylinder showed the consecutive stages of a movement. When the cylinder rotated, these stages were reflected in rapid succession on a mirrored prism mounted on the pivot, and the viewer who looked at the prism would see the drawn image move freely.

(Bendazzi, 1994: 4)

The Praxinoscope soon became a popular children’s toy, and anticipated the fate of a great deal of work in animation by being dismissed as a novelty and relegated to a children’s audience. Reynaud ultimately modified the Praxinoscope, however, and created the proto-cinema of the ‘Théâtre Optique’ in 1889. The short, coloured, strips of images required for the Praxinoscope became longer spools of images painted on ribbon which were back-projected on to a screen by means of a primitive projector allied to more mirrors and a bigger light-source. Reynaud’s films included his first experimental piece, A Good Beer (1888), The Clown and His Dogs (1892), and Poor Pierrot (1892), the latter, ten-minute entertainments incorporated into theatrical shows, often with simulated sounds to accompany the illusion of narrative action (e.g. the crack of a stick when Pierrot, the clown, was beaten by his master). The most significant point to emerge from these achievements, however, is not concerned with art, but with industry, and characterises the popular view of animation even in the contemporary era. The very craftsmanship of the animated film became its inhibiting factor at a time when the immediacy of the photographic image was its novelty and its passport to industrial legitimacy, and thus the name of ‘cinema’ itself. Ralph Stephenson argues that Reynaud’s place in the development of the moving image must not be undervalued, however, and suggests, ‘He not only invented a technique, he originated a genre and was the first to develop the animated film (indeed the cinema if by cinema we mean movement, not photography) into a spectacle’ (Stephenson, 1967: 27).

Live-action film-making in the realist style of the Lumière Brothers’ early works quickly became the dominant mode of film-making. ‘Animation’, as such, survived unnoticed in the guise of ‘trick’ photography, and informed many of the early approaches to film-making which looked to create fantasy narratives or comedy. This is best exemplified in the magical fantasies of Georges Méliès (see Fraser, 1979) or the comedies produced and distributed by Pathé at the turn of the century and in the early teens. Animators didn’t just disappear, of course, but continued working in the medium, developing its forms and techniques, having to accept its apparently less credible position as a second cousin to mainstream cinema. It may be argued that this early setback for animation in film history has been more than remedied by the work of the Disney Studio, who essentially put animation on the map. Equally, it may be argued that such a dominant model for animation has ghettoised the form itself by overshadowing its early history and creating an orthodox style. Animation, in some ways, has become synonymous with Disney and thus other kinds of animation and other important film-makers in the field have been further neglected.

Understanding Animation not merely wishes to address these issues and reclaim the animated film as an important art form in its own right, but to provide a variety of points of access into the study of the medium. To study animation is to acknowledge its place in cinema history and to properly evaluate its achievements. Clearly, in the contemporary era, the animated film has a much higher profile, chiefly through the continuing domination of the Disney Studios, the proliferation of cartoons on mainstream television, and the popularity of the Japanese manga films (see McCarthy, 1993). In many senses, however, this creates as many problems as it apparently resolves. This scenario still consigns the animated film to its traditional children’s audience, defines the animated film as ‘a cartoon’, and sustains a view of animation as something which merely fills time in the schedules, or appeals to marginalised tastes. The recent proliferation of animation festivals worldwide, however, coupled with enlightened commissioning policies as adopted by Channel Four in Britain, and the declaration of new national cinemas in the post-Cold War period, has done much to raise the profile and status of the form.

Ironically, even in what may be regarded as a significant development in the reclamation of animation as an important and influential medium, the Robert Zemeckis film, Who Framed Roger Rabbit? (1988), still shows “Toontown” as a place which is disparaged. As Susan Ohmer has noted, ‘Toons’ are universally disliked, and, significantly, even subject to the kind of segregation suffered by Black people in America in the pre-Civil Rights era (Ohmer, 1988: 97–104). This is clearly an overdetermination, but a significant one if recognised as a representation of the way the film’s producers, an alliance of Warner Brothers, Disney, and British-based animators like Richard Williams, view the cultural neglect of the animated film. Inevitably the film frames ‘Toons’ in this way to illicit sympathy for, and nostalgia about, a golden era of animation in America during the 1930s and 1940s. Animation, it seems, cannot escape the idea that it is a trivial and easily dismissed form, but most significantly, it seemingly cannot escape the view that it is a thing of the past, a bygone art. Thankfully, however, and necessarily, recent scholarship has also reclaimed this period through detailed studio histories, important biographical work on significant animators, books concerned with style and practical techniques, and some critical work on the modes of construction and aesthetic intention at the heart of the films (see Bendazzi, 1994; Frierson, 1994; Klein, 1993; Maltin, 1987; Pilling, 1992; Russett and Starr, 1976; Solomon, 1989). These texts fundamentally legitimise the art of animation and recognise its influence and achievement. Clearly I will be drawing extensively on this ground-breaking material, but first, I would like to recall two examples of
the use of the animated film in mainstream live-action films which usefully foreground the rest of my discussion.

‘If the story’s so cock-eyed, what’s the point of it?’

The Blackboard Jungle (1955), perhaps best remembered for the use of Bill Haley’s ‘Rock around the Clock’ beneath the credits, features a sequence in which teacher Richard Dadier (Glenn Ford) uses a cartoon to engage a class of urban delinquents, including Black musician Greg Miller (Sidney Poitier) and sceptical, knife-wielding Artie West (Vic Morrow). Dadier recognises that the language of the cartoon, with its use of comedy, lack of obvious didacticism, and assumed ideological innocence, presents no threat to the class, and gives them amusement and diversion from the formality of normal classroom practice. In one of the first recorded instances of Film Study, Dadier then encourages the class to talk about the cartoon, using the tale of ‘Jack and the Beanstalk’ as educational stimulus. He essentially invites the class to use the cartoon to interrogate the fairytale. The boys evaluate the story, but simultaneously, if inadvertently, start to make comment upon the cartoon itself and ways in which it might be understood. They talk about narrative implausibility (‘This is a fairy tale, he just flew!’), the interpretation of character (‘Jack, he ain’t no hero, he’s a pretty dumb hick’), the moral and ethical issues raised by the film (‘Look, the way I got it figured, this Jack, he’s a square. First off, he don’t care if his old lady starves to death’), and who illicits sympathy in the story (‘I kinda felt sorry for the giant’).

Most importantly, from Dadier’s point of view, the boys have the visceral pleasures of enjoying the film and laughing at its jokes, but start to locate the questions raised by the cartoon within their own experience. Confronted with the multiplicity of interpretations that the cartoon inspires, one boy says ‘If the story’s so cock-eyed, then what’s the point of it?’, which solicits the inevitable response from Dadier that he should ‘Just examine the story, look for the real meaning’. The scene is a turning point in the film because both Dadier and his colleagues acknowledge that, for the first time, an educational breakthrough has occurred with previously disinterested and frequently delinquent students. I am not, of course, suggesting that studying animation is a panacea for all social ills, or that its study should be directed purely at those who seem to be on the edge of a life of crime! However, the scene does endorse the view that ‘a cartoon’ (read ‘animated film’) can carry important meanings and engage with social issues. In short, the animated film has the capacity to redefine the orthodoxies of live-action narratives and images, and address the human condition with as much authority and insight as any live-action film.

Preston Sturges’ Sullivan’s Travels (1941) corroborates this view in its deployment of the Disney short, Playful Pluto (1934). Chained convicts – criminals largely as a consequence of the Depression – are invited to join a black congregation to watch the cartoon as a small respite from their suffering. Among them is film director, John L. Sullivan (Joel McCrea), who has disguised himself so as to experience life as a hobo in order to make a social-realist film, Brother, Where Art Thou?, concerned with social injustice. Sullivan has previously only made light comedies like Hey, Hey in the Hay Loft and Ants in Your Pants, films which he views as glib and trivial despite their success. Sturges’ satire merely exposes Sullivan’s naivety when Sullivan discovers that he genuinely knows nothing of real hardship and that those who constantly endure it find some comfort in laughter and the relief afforded by comedy, here explicitly illustrated by their enjoyment of Playful Pluto. Sturges was careful to construct the discourse between the audience and the action of the cartoon by choosing a purely visual sequence. As Brian Henderson suggests:

The church movie scene in Sullivan’s Travels required alternating brief bits of screen business with gales of laughter in the audience, a tide of mirth that Sullivan finds puzzling at first, then understands and resists, then gives way to. A cartoon scene that achieved its effects through dialogue would have initiated a logic that detracted from the logic of Sturges’ own scene. . . . Showing Pluto trying to extricate himself from flypaper only to get ever more entangled fitted the bill perfectly.

(Henderson, 1991: 161)
Sturges asks the audience of Sullivan’s Travels to address the relationship between the audience in the film and the effects of the cartoon. Sullivan probably represents a certain kind of audience who resist the appeal of the cartoon but ultimately enjoy its mode of expression. Purely in visual terms the cartoon, echoing silent slapstick comedy, has the capacity to amuse but, more importantly, it possesses the ability to absolutely resist notions of the real world. I will address ‘realism’ within the animated film later in my discussion, but here it should be stressed that Sturges uses the cartoon to promote the idea that its very language represents the world in an intrinsically different way. The animated film creates a narrative space and visual environment radically different to the live-action version of the world. The cartoon here connotes escapism and unambiguous visual pleasure, albeit unthreatening and comforting, but the way Sturges contextualises the cartoon demands that its difference and effect be recognised.

Both Blackboard Jungle and Sullivan’s Travels foreground the animated film as the vehicle by which significant moments of revelation and understanding take place. Both films thus invest the animated film with a specific ability to communicate complex, and sometimes contradictory, ideas within the framework of an apparently accessible, yet taken for granted, form. It is my intention in Understanding Animation to determine a number of methodologies which legitimise the analysis and interrogation of what, in the first instance, might seem to be self-evident texts made purely to entertain, and not to carry significant meanings about art and society. Further, it is my contention that animation as a film language and film art is a more sophisticated and flexible medium than live-action film, and thus offers a greater opportunity for film-makers to be more imaginative and less conservative. Blackboard Jungle and Sullivan’s Travels implicitly recognise and foreground this in the sequences where cartoons are used. The animated film enables the film-maker(s) to be more expressive and thus more subversive than is readily acknowledged. Almost consciously, animators, in being aware that they, and their works, are marginalised and/or consigned to innocent, inappropriate or accidental audiences, use this apparently unguarded space to create films with surface pleasures and hidden depths. In Blackboard Jungle, the cartoon carries with it the idea that appearance and identity is a relative and constantly changing thing – a key element in all cartoons, while Sullivan’s Travels uses the very anarchy and comic extremism of the cartoon to subvert the idea of representing the reality of the Depression in a film. It must be stressed, however, that the subject of my discussion is animation, and not merely the cartoon, which is only one of the forms I wish to address. Indeed, my analysis is an attempt to reconcile certain approaches to a variety of animated films, and to view animation as a distinctive form that works in entirely different ways from live-action cinema.

In using the ‘difference’ inherent in the animated film to counterpoint live-action, films like Blackboard Jungle and Sullivan’s Travels demand that audiences compare the two forms. Animator Alexandre Alexeieff, writing in 1973, addressed this issue, and suggested that ‘the repertoire of photographic cinema is limited and close to exhaustion’ (Bendazzi, 1994: xxii) thus implying that animation would come to the fore and be recognised as the progressive medium that it is. This is a view wholly vindicated by: the championing of animation by broadcasting companies, commercial industries, museums and educational institutions in the 1990s; the use of animation as part of the repertoire of special effects deployed in mainstream cinema (echoing the use of animation by the pioneers); and the rise of computer animation almost as a new digital cinema in its own right. Alexeieff stressed,

Contrary to live-action cinema, Animation draws the elements of its future works from a raw material made exclusively of human ideas, those ideas that different animators have about things, living beings and their forms, movements and meanings. They represent these ideas through images they make with their own hands. In the causal concatenation of their images – a concatenation they conceive themselves – nothing can be left to chance. For this reason, creation requires an exceedingly long time which is out of proportion to live-action cinema. But the repertoire of human ideas is inexhaustible.

(Bendazzi, 1994: xxii)

In emphasising the human aspects informing the uniqueness of animation Alexeieff ironically highlights the illusiveness of the form. A first inspection seems to reveal that there are as many individual styles and approaches as there are individual animators, all engaged in the creation of an animated film. How then, is it possible, to address ‘animation’ given its apparent difference and multiplicity? The answer lies not in attempting to compile exhaustive lists of films or to provide profiles of major animators, though this is beneficial and important (see Bendazzi, 1994; Halas, 1987), but to try to suggest a number of ways in which any animated film may be addressed and analysed.

‘So, what’s the answer? Visual education?’

So asks one of Dard’s colleagues in Blackboard Jungle after his triumphant lesson using a cartoon. The study of animation has had to surmount the incredulity of both students and academics who have not recognised the medium as an important and neglected aspect of film-making practice, despite its obvious popularity and endurance in the face of passing generic and aesthetic trends in other areas of cinema. Animation has been trivialised and ignored despite its radical tendencies and self-evident artistic achievements at the technical and aesthetic level. Ironically, the dominance of the cartoon (i.e. traditional ‘cel’ animation in the style of Disney or Warner Brothers, which is predicated on painting forms and figures directly onto sheets of celluloid which are then photographed) has unfortunately misrepresented the animated film because its art seems invisible or, more precisely, is taken for granted by its viewers. The cartoon seems part of an easily dismissed popular culture; ‘animation’, as a term, at least carries with it an aspiration for
recognition as art and, indeed, the proper evaluation of other animated forms. Importantly, though, scholars and historians have repositioned the cartoon as an art-form (see Adamson, 1975; Cabarga, 1988; Crafton, 1993; Holliss and Sibley, 1988), and provided the platform for the recovery of other kinds of animation, which may not have had the same kind of popular audience or terms of address, but deserve recognition and study nevertheless. This is particularly necessary in regard to the recovery of traditions of animation in other countries and in more experimental styles.

Understanding Animation represents the first tentative steps to introduce some of these agendas to students of animation, and to provide some models by which they may address a highly complex form exemplified in numerous ways by hundreds of animators worldwide. Understanding Animation is, therefore, part history, part theoretical speculation, and part spirited defence of a neglected but important film form. Inevitably, it will be flawed, seeking not to be definitive but provocative, providing the platform for future debate and revision. In many senses, it is a work in progress, half-informed by my own discovery of the form, half-driven by the desire to promote discourse about its achievements. The book is, therefore, divided into a number of areas of study – first, how the animated film may be addressed, both in relation to its history and evolution, and in regard to its modes of construction. Second, the ways in which the animated film possesses distinctive narrative techniques that inform its uniqueness as a medium of expression. Third, the methods by which animation engages with comedy. Fourth, the agendas raised in the animated film in regard to matters of representation and, finally, an engagement with the notion of spectatorship and animation, delineating some of the experiences enjoyed by its audience.

In order to foreground the relationship between the cartoon and other kinds of work, Understanding Animation theorises the cartoon as 'Orthodox Animation' while categorising other work as either 'Developmental Animation' or 'Experimental Animation'. These terms will be defined and illustrated in Chapter Two, but these categories essentially determine cel animation as orthodox animation; other kinds of accessible narrative based films, made in other forms (i.e. clay, puppets, collage etc.) as developmental animation; and finally, non-objective, non-linear or abstract films as experimental animation. Inevitably, some animation crosses over these definitions, but these terms offer general signposts for certain types of work. This is to begin to define the animated film at the level of form (i.e. the way in which it has been made) in the generation of meaning. It should be stressed here that form is being analysed through the text itself and not specifically through its technical preparation, although some attention will be paid to production processes in certain cases involving particularly unusual or imaginative techniques.

When addressing any of these topics, the choices of films constituting case studies are purely subjective, determined often by the availability of the films or the sheer desire to write about them. I have attempted, however, to include: films from a variety of different geographical contexts and historical periods; films reflecting a wide range of subject areas and approaches; films made by men and women, illustrating the increasing presence of women in the field and the creation of a 'feminine aesthetic' unique to animation; films of recognised significance and influence, and films which operate as models for similar kinds of film and thus represent a broader area. Inevitably, because I am writing from a British context, there are a number of British films under discussion in my analysis. For this I make no apology, especially in the light of the recent Oscar-winning achievements of Nick Park (Creature Comforts (1990); The Wrong Trouser (1994)), Daniel Greaves (Manipulation (1991)) and Alison Snowden and David Fine (Bob's Birthday (1995)). Similarly, the very dominance of the American cartoon tradition necessitates its prominence but, ironically, its predominance still remains fundamentally uninterrogated and these films will become fresh texts in the light of new theoretical approaches to them. Some areas of theoretical address, however, are only hinted at or partially addressed in the text. This is partly due to the limited space available to follow too many aspects of enquiry, and partly in the spirit of providing models which are are only half-formed in the hope that they will be developed. It is further hoped that ideas and issues raised will provide students with a set of transferable models for the study of animated films of their own choice. What is most significant about the multiplicity of approaches discussed here is that they may enable students to find an appropriate point of access for study in tune with their own interests and expand the discussion.

Animator Robert Breer once said in a revealing comment that, as an in-joke, animators often include a drawing of a brick within the continuity of a drawing of a moving object, for example, a bird flying. Of course, when an audience sees the film, it cannot see the brick as it passes too quickly for the eye to perceive but, interestingly, Breer suggests that once an audience has been told of the presence of the brick they observe the image much more closely. Understanding Animation will encourage the viewer of animated films to 'see the brick' in the sense that it will promote and provide the frameworks for a proper engagement with the animated film and the possibilities afforded by animation itself. To understand the particular illusion that is distinctive to animation is to penetrate its magic and its meaning.
1
THINKING ABOUT ANIMATED FILMS

What is animation?

To animate, and the related words, animation, animated and animator all derive from the Latin verb, animare, which means 'to give life to', and within the context of the animated film, this largely means the artificial creation of the illusion of movement in inanimate lines and forms.\(^1\) A working definition, therefore, of animation in practice, is that it is a film made by hand, frame-by-frame, providing an illusion of movement which has not been directly recorded in the conventional photographic sense. Although this is a definition which serves to inform conventional cel, hand-drawn and model animation, it has proven insufficient in the description of other kinds of animation, particularly the kinds of animation that have been facilitated by new technologies, chiefly those images which are computer generated or subject to other kinds of pictorial manipulation. Consequently, in order to reach a more precise definition, it is useful to consider the view of Norman McLaren, one of the medium's acknowledged masters. He says, 'Animation is not the art of drawings that move, but rather the art of movements that are drawn. What happens between each frame is more important than what happens on each frame' (Solomon, 1987: 11).

As suggested in the Introduction, McLaren reinforces the notion that the true essence of animation is in the creation of movement on paper, the manipulation of clay, the adjustment of a model etc., before the act of photographing the image, i.e. the activity that has taken place between what become the final frames of film. Animators of the Zagreb School, in the former Yugoslavia, however, seek to develop this definition further by stressing the aesthetic and philosophic aspects of the craft. They suggest, that to animate is 'to give life and soul to a design, not through the copying but through the transformation of reality' (Holloway, 1972: 9). Though recognising the importance of animation as a technical process, the Zagreb film-makers wanted to emphasise the creative aspect of literally 'giving life to' the inanimate, revealing something about the figure or object in the process which could not be understood under any other conditions. Film-makers at Zagreb, including leading light, Dusan Vukotic, wanted to transform reality and resist the kind of animation created by the Disney Studios which, for all its personality and comic energy, conforms to a certain mode of realism concordant with live-action film-making, which in turn conforms to and reinforces a dominant ideological position within the USA. I will address the complex issue of 'realism' in the animated film a little further into my analysis but, at this stage, it is sufficient to say that the Zagreb School perceive animation as a non-realist and potentially subversive form. As if to confirm this point, British based animators, John Halas and Joy Batchelor, posit the view that, 'If it is the live-action film's job to present physical reality, animated film is concerned with metaphysical reality — not how things look, but what they mean' (Hoffer, 1981: 3).

Implicit in the study of the animated form is how 'meaning' is generated by the unique vocabulary available to the animator which is not the province of the live-action film-maker. Czech surrealist animator, Jan Svankmajer perceives this vocabulary as liberating, unique and potentially contentious:

Animation enables me to give magical powers to things. In my films, I move many objects, real objects.Suddenly, everyday contact with things which people are used to acquires a new dimension and in this way casts a doubt over reality. In other words, I use animation as a means of subversion.\(^5\)

Svankmajer's view probably best articulates the real possibilities available to the animator, in the sense that he stresses how animation can redefine the everyday, subvert our accepted notions of 'reality', and challenge the orthodox understanding and acceptance of our existence. Animation can defy the laws of gravity, challenge our perceived view of space and time, and endow lifeless things with dynamic and vibrant properties. Animation can create original effects — a point well understood by pioneer film-makers like Georges Méliès and early animators like J. Stuart Blackton, Emile Cohl and WInsor McCay.

Flipbooks, frame-by-frame and funny faces

The development of the animated form is specifically related to the early experiments in the creation of the moving image. As early as 70 ic there is evidence of a mechanism that projected hand-drawn moving images onto a screen, described by Lucretius in De Rerum Natura. In the sixteenth century, 'flipbooks', like the one described by Doctorow earlier, emerged in Europe and often contained erotic drawings which, when flicked, showed the performance of sexual acts. It is interesting to speculate that this kind of drawing, pornographic though it probably was, prefigures the type of animation which resists realistic representation, and recognises the possibility in 'animation' of expressing feelings and thoughts about taboo subjects without inhibition. The realisation of movement in these drawings clearly transcribes the acts themselves into another medium and privileges the act of 'looking', but also foregrounds the notions of recognition and complicity. The idea of 'looking' was properly addressed in 1825, when Peter
Mark Roget wrote what was later to be called the 'Persistence of Vision' theory. This theory determined why human beings could perceive movement, i.e. that the human eye sees one image and carries with it an after-image onto the image that follows it, thus creating an apparent continuity. This is of the utmost importance in watching moving pictures in general, of course, but is particularly significant in legitimising the kind of animated cinema that was to be achieved frame-by-frame. The 'persistance of vision', as it were, was the very recognition of the movement achieved between the frames that McClaren stresses is the essence of animation.

With developments like the Phenakistoscope pioneered by Plateau in 1833; the Zoetrope, invented by W.G. Horner in 1834; Coleman Sellers' Kinematoscope in 1861; and the Praxinoscope, described earlier, and patented by Reynaud in 1877, there was the eventual emergence of the cinematic apparatus. Still intrinsic to the understanding of these developments was the idea of the moving image as essentially magical – something colourful, playful and 'miraculous' in its manipulation of still images. This notion was essentially eradicated by the realism of early cinema photography, but perpetuated in trick films and forms akin to, and instrumental in, the continuing development of the animated film.

This may be most obviously seen in the comic strip form, which was established in the American print media industries by the late 1890s. This is important because the comic strip was to help provide some of the initial vocabulary for the cartoon film.

[... ] including continuous narration, whereby a single set of characters appears repeatedly from frame to frame and the action progresses from left to right; calligraphic caricature, which renders the protagonists and their adversaries immediately recognisable; facial and gestural schemata, which express the characters' actions and reactions; action abstraction, a pictorial shorthand, universally understood, in which exploding lines indicate sudden impact, stars unconsciousness, light bulbs ideas and balloon puffs thoughts; literary legend, conveyed in a balloon, which clarifies the comic's visual message; and specialised vocabularies, such as 'Banana Oil!', 'Zap!' and 'Pow!' which heighten the extreme emotion or action manifested by the characters.

(O'Sullivan, 1990: 9)

By 1893, the New York World and New York Journal were using colour printing in their strips and these may be seen as prototypic of later animated forms. Indeed, Richard Felton Outcault, working in the Journal's 'American Humorist' supplement, created Hogan's Alley, which featured as its main character, the Yellow Kid, who was printed yellow as a test for the new tallow-drying process. As Judith O'Sullivan notes, 'Since then the term yellow journalism, popularly supposed to have derived from the Yellow Kid, has been applied to newspapers that feature sensational reporting and conspicuous display as a means of attracting viewers'

(O'Sullivan, 1990: 13). 'The Yellow Kid' anticipates another yellow kid, Bart Simpson, by about one hundred years, but the creator of The Simpsons, Matt Groening, also a cartoonist before becoming an animator, similarly coloured his characters yellow in order to create a conspicuous identity for his animated family and enable 'channel-surfing' viewers to locate the programme with ease.

The relationship between the comic strip and the animated cartoon will be examined further later but, before the formalism of the comic strip became an intrinsic part of animation, 'animation' itself was still in the hands of the magicians. Chief in the development of 'trick effects' in the emergent cinema was Georges Méliès. The story of his accidental discovery of the 'dissolve' (i.e. when one image fades into another) when his camera accidentally jammed, led him to pioneer a whole number of other cinematic effects which have become intrinsic to the possibilities available to animators. These included 'stop motion photography', split-screen techniques, fast and slow motion, and the manipulation of live action within painted backdrops and scenery. Méliès was also a 'lightning cartoonist', caricaturing contemporary personalities, speeding up their 'construction' on screen by undercranking the camera. In many ways animators and animation, during this early primitive period, were the first to self-consciously address the possibilities of the medium in an aesthetic rather than technical way. The divorce between live-action cinema and animation as its own art was imminent.

By 1900, J. Stuart Blackton had made The Enchanted Drawing. He appeared as a 'lightning cartoonist' drawing a man smoking a cigar and drinking some wine. By the use of stop motion, one drawing at a time is revealed and the man's face is made to take on various expressions. Various similar films emerged, including The Vanishing Lady (1898) and A Visit to the Spiritland (1899). These films can be classified proto-animation as they use techniques that are used by later animators but are not strictly and wholly made frame-by-frame. Blackton achieved full animation of this sort in Humorous Phases of Funny Faces (1906). Though using full animation in key sequences, the film was still essentially a series of tricks. Primitive notions of narrative animation followed in the early work of famous comic strip artist, Winsor McCay, who under Blackton's supervision at the Vitagraph Brooklyn Studio made an animated version of his most celebrated strip, Little Nemo in Slumberland, in 1911. In an extraordinarily prescient moment, McCay, interviewed in the Buffalo Enquirer in July 1912, anticipated the conflation of the graphic arts and cinema that became the animated film industry:

There will be a time when people will gaze at [paintings] and ask why the objects remain rigid and stiff. They will demand action. And to meet this demand the artists of that time will look to the motion picture for help and the artist, working hand in hand with science, will evolve a new school of art that will revolutionise the entire field.

(Quoted in O'Sullivan, 1990: 26)
enigmatic quality, signifying kinetism yet denying its source and possible intention. The illusion of life in animation was profoundly more challenging than the seemingly unmediated and recognisable representation of reality in live-action films, despite their novelty as an emergent popular art. As such, the animated film was soon perceived as something intrinsically different from the kind of films that began to constitute popular cinema. The animated film thus became defined by its distinctive technical and aesthetic qualities, in both two- and three-dimensional forms.

The Haunted Hotel had been released in the USA and France. In France, French animator, Emile Cohl, completed his Fantasmagorie in 1908. His later film, En Route, was released in the United States in 1910. Cohl employed a technique in line drawing where lines would fall randomly into the frame and converge into a character or event. Cohl's incoherent cinema was essentially the free flow of seemingly unrelated images in the stream-of-consciousness style of the Modernist writers. Further inspection reveals an implied, and more significant, level of relatedness in the imagery, prefiguring later animated films which trust the elements intrinsic to animation, chiefly, the primacy of the image, and its ability to metamorphose into a completely different image. Such metamorphoses operate as the mechanism which foregrounds this new relatedness by literally revealing construction and deconstruction, stasis and evolution, mutability and convergence. Such imagery did not operate as a set of visual tricks or jokes, nor did it constitute a conventional literary narrative, but was a kinetic construction wholly determined by the choices made by the animator, relating images purely on his own personal terms, sometimes by obvious association, sometimes by something entirely within the domain of his own psychological and emotional involvement with the visual system.

This technique was borrowed by McCay in Little Nemo and informed his other key works as he translated his comic strip style into the newly established animated form. Based on one of his 1909 comic strips, Drums of a Rabbit Fraud, McCay made The Story of a Mosquito (1912), a mock horror story of a mosquito graphically feeding on a man until it is so bloated with blood that it explodes. McCay differed from Cohl, however, in prioritising narrative clarity, even in the most apparently illogical or irrational dreams that informed his stories. The sense of narrative sequence in McCay's films is the trait he most obviously maintains from his comic strips. McCay's most significant contribution to the animated form though is the development of personality or character animation through his creation of Gertie the Dinosaur (1914). The playful dinosaur Gertie gleefully hurls a mammoth into a lake in the film and clearly displays an attitude. This anthropomorphism (the endowment of creatures with human attributes, abilities and qualities) later informs the work of Walt Disney, and indeed, remains the consistent locus of a great deal of animation, raising questions about the role and identity of beasts and their behaviour which is discussed in relation to gender issues in Chapter Five. McCay clearly saw Gertie as 'a woman with her own mind', and sought to authenticate her identity in its own right by conducting a
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demonstrated the viability of animation as a commercial industry capable of mass production. This move towards the industrialisation of animation as a filmmaking process was viable at the economic level but had significant consequences in inhibiting the development of the form itself on purely creative terms. The individual nature of animation was essentially sacrificed to collective production, and this could be achieved by alloying the production of animated films with the specific vocabulary of the comic strip, which could be readily understood by all the available animators. 'Individuality', at this stage, could only be properly expressed through the content of the films as the emergent industry quickly rationalized its form in order to maximise efficiency of production and distribution. In essence, this meant that individuality could only be expressed through the primate of 'gags' and the evolution of a comic vocabulary that has since come to dominate the form (see Chapter Four).

Between 1913 and 1917, the dominant mode of animated film was the adaptation of the comic strip. In 1913: Eclair released The Newywed, based on a strip by George McManus which he had drawn some nine years earlier, animated by Emile Cohl; Essanay released and distributed the 'Dreamy Dud' series, drawn by Chicago Interocean cartoonist, Wallace Carlson; Earl Hurd joined John Bray, and with Gregory LaCava, produced animated versions of popular comic strips like George Herriman's 'Krazy Kat' and Rudolph Dirks' 'Katzenjammer Kids'; and Raoul Barre partnered Charles Bowers in the production of a series of cartoons featuring Bud Fisher's characters, 'Mutt and Jeff'. It is worth noting here that if the aesthetic considerations of animation were still located in the dynamics of movement itself, the industrial aspects determined that animation should concern itself with entertainment values. These were soon consolidated into cartoon concepts that partly define the first apotheosis of animation yet also determine the limits that the industrial process was implicitly placing on the further development of the form.

Case study: Early comic strip cartoon concepts

Soda Jerks (1920) by Hurd and Barre, serves as an interesting example of the early cartoon form in the sense that it represents how the comic strip creates a vocabulary for the animated short. Mutt, a gangly authoritarian straight-man, and Jeff, a small, balding, clown-figure, with a handlebar moustache that stretches right across his face to his sideburns, are two characters already established in the public mind by H.C. 'Bud' Fisher's popular comic strip. Fisher's work was often characterised by moments of comic reversal. In one example, Jeff tells Mutt that he has invented a pair of spectacles that enlarge things to enormous proportions and that he intends to sell them to baseball players on the basis that the ball will appear so large no player will ever fail to hit it. Mutt counters that the same glasses will make first base seem miles away and the ploy will backfire. Defeated Jeff exits, leaving Mutt longingly examining a tiny 'New York steak' made huge by wearing the glasses. The strip defines the relationship between the dialogue with her when he showed his film during his vaudeville act. McCay attempted to sustain the illusion that Gertie was corresponding to his commentary by synchronising his actions accordingly and concluded his film with Gertie apparently lifting McCay up while he, of course, exits stage left. McCay appears to pass into the film, and provides an example of what would become a continuing discourse between animation and live-action film in the medium's early years. It is as if the early animators wanted to constantly expose the limitations of representing 'reality' on film and insist upon the domain of 'fantasy' as: first, the most appropriate mode of expression for the cinematic form and, most specifically, the animated form; second, as the most versatile model by which to create amusement and illusion; and third, as the most expressive vocabulary by which to interrogate the complexities of the human condition. This may seem too grand a claim for these early vehicles, but it is important to note that McCay's subject matter was deliberately chosen to avoid the notion that its creation was in any way bound up with the achievements in photography. Mythic, extinct, or microscopic creatures, the characters that feature in McCay's work could not be photographed, yet all are characterised by an authentic principle of motion, thus heightening both the belief in the creatures themselves, but also the capability of the medium. McCay's animated films clearly represent a development in animation at the technical and artistic level, using self-conscious exploitation of the codes and conventions of the comic strip form to successfully conjoin the apparently surreal with the conditions of the real world. McCay's comic strips and films aspire to the condition of an interior state rationalised by external mechanisms, constructing narratives which reveal some of humankind's deep-rooted fears in the Modernist era. These are chiefly anxieties about relationships, the status of the body, and advances in technology, all of which evoke threat and disorder, and it is, perhaps, ironic that these kind of themes are only properly acknowledged in McCay's work when he makes the first animated documentary, The Sinking of the Lusitania (1918), which uses a realist mode to engage with the horrors of the tragedy. Interestingly, his approach to animation still corresponds to McCay's, in the sense that this too was an event that was impossible to record. His film, therefore, becomes part informed speculation, part quasi-newsreel, part propaganda, and raises many further issues about animation and the representation of reality, which I will discuss later.

While McCay can claim to have created the first colour cartoon (he hand-tinted at least one of the prints of Little Nemo), and produced a cel-animated film, Winsor McCay Makes His Cartoons Move (1911), (using rice-paper cels), it is John R. Bray who, incorporating similar initiatives by another animator, Earl Hurd, pioneered the cel-animation process using translucent cels in 1913, and made a film called The Artist's Dream. At about this time, Raoul Barre also developed the first production process which enabled animated films to be made by a number of people with specific roles within an industrialised studio base. Bray studios soon developed a similar process and released a series of cartoons with a continuing character, 'Colonel Heeza Liar', a parody of President Teddy Roosevelt, and
two characters and demonstrates a comic logic that simultaneously enjoys the physical comedy around the issue of size and shape, the manipulation of expected outcomes to develop the comedy, and the satiric edge which implicitly critiques New York butchers and restaurateurs.

In Sols Jers, Hurd and Barre cast Mutt as the owner of a soda parlour and Jeff as his underdog counter assistant. The parlour and, indeed, many figures throughout the cartoon remain static, revealing Barre’s ‘slash’ method of animation in which only the aspects of each frame which moved were actually animated. This involved creating a sequence of movements already drawn on sheets and placed in a pile, the areas designated to move, ‘slashed’, or torn, as it were, from the top image to reveal the next movement, while the background remained unchanged. This perpetuates the look and style of the comic strip, and the sense of linear progression in the narrative that comic strip readers were accustomed to, but it also privileges the narrative importance of certain movements, and the function of the movements in the creation of physical comedy.

Jeff tries to impress a lady customer, not merely by serving her, but by standing on a box jerkily posing and dancing. He blushes, graphic hearts appearing over his head popping with embarrassment, before Mutt pushes him away, whereupon he receives a blow on the head with an umbrella from another irate lady customer and falls into a box. The influence of silent slapstick comedy is readily apparent here, but is exaggerated yet further by the elasticity of the animation and the accompanying convention of spinning stars around Jeff’s head. Hurd and Barre attempt to reduce the number of speech ‘bubbles’ which characterise the comic strip, preferring to tell the story visually, and employ title cards for important lines of dialogue. Mutt says ‘Boy, get me some syrup’ which angers Jeff, who, feeling humiliated, exacts his revenge by filling the syrup tank with ‘Pep – A Powerful Tonic’, a bottle of which stands incongruously among the syrup bottles. This is essentially the establishing premise of the narrative, which then becomes a sequence of ‘spot gags’ based on the consequences of different characters mistakenly drinking the tonic. This structure is also common to many later cartoons which prioritise ‘gags’ over story and deploy what Gerald Mast calls ‘ripping’ in improvising a number of comic events within a given situation (Mast and Cohen, 1974: 462).

The cartoon becomes faster; the woman who first drinks the tonic dances frantically, puts a glass on Mutt’s nose (which Jeff breaks with a mallet), and tumbles into the street, her vocal wails of ‘Whoops’ and ‘Whew-ee’ literally written on the image. Bystanders, and particularly a standard silent cinema coupling of a small man and a tall woman, venture into the soda parlour to find out what is happening. They too, take the tonic. The tonic, in being the chief catalyst for the action, and the mechanism by which any notion of ‘realism’ may be disrupted, legitimises Hurd and Barre to use the narrative space purely for a display of the possibilities available to the animated form. For example, once the couple drink the tonic, their heads become subject to the squash and stretch technique, whereby given the supposed effects of the tonic, their heads elongate and compress in the comic fashion of a body reflected in a hall of mirrors. These movements are accompanied by ‘action abstraction’, i.e. quivering white lines which accentuate the physical changes. The sequence climaxes with the couple emitting puffs of smoke – their bodies apparently having boiled over or exploded. Notions of the body becoming mechanistic will be discussed in my analysis of comic modes in animation which, in themselves, are clearly a major factor of the evolution of the animated film.

The couple, like the first woman, pirouette into the street, and it is here that the cartoon demonstrates its capacity not merely to construct comic effects, but to legitimise the breaking of taboo, an important factor that is to characterise the development of the animated film. The very language of animation seems to carry with it an inherent innocence which has served to disguise and dilute the potency of some of its more daring imagery. I will return to this issue throughout my discussion but, in this instance, it is sufficient to say that the actions of the couple in Sols Jers – the exposure of the woman’s frilly undergarments, tying the policeman’s truncheon in a knot, ripping the policeman’s uniform and biting his shin – all operate, despite their apparent comic innocence, as subversive acts. Though it may be argued at this point that these events merely echo the comic business of the silent movies, it is important to recognise that as the animated film progresses, its acts of subversion become more complex and radical but seemingly remain innocent by virtue of the form in which they are created.

Issues of gender, sex and sexuality, and law and order are being played out in this comic scenario, but they are essentially ignored because they are part of ‘a cartoon’. The transgressive possibilities available to the cartoon, therefore, seem limitless, and this has not been lost on animators since the evolution of the form. A cartoon like Sols Jers is just the beginning.

Like many later cartoons, as well as employing ‘spot gags’, Sols Jers uses a ‘running gag’. In this instance it is the recurrence of a policeman’s attempts to telephone the police station in order to report the anarchic events emanating from the soda parlour. The station sergeant remains asleep (naturally signified by closed eyes, his hand propped on his chin and numerous accompanying ‘z’s’) even though he sits directly next to the phone. The phone, of course, quivers when it rings while its sound is signified once more by the action abstraction of white lines emerging from it. The policeman finally wakes the sergeant by taking the cartoon option of literally reaching through the phone and hitting him on the head. This operates as a piece of comic logic which becomes a typical part of the cartoon, i.e. the literal appropriation of space which, in reality, either does not exist or cannot be physically attained. The assumption here is that the policeman can extend his arm, reach through an object, follow the route of the assumed phone line, and completely violate and compress any notion of time and space. The creation of ‘impossible’ events becomes, of course, the stock-in-trade of all animated films.

Meanwhile, the man from the couple dances in the street in front of a group of
bystanders who, not surprisingly, marvel when the man’s shoes dance on their own. The importance of ‘dance’ in animation must not be understated, as, even in its comic form here, it anticipates sophisticated use in later work which allies the choreographic possibilities of physical expression with the open agenda of the principle of motion as it exists in animation (see Chapter Three). After climaxing his street performance by diving into his own hat, the man tells the crowd about the parlour, and all trample over him in their desire to try the soda for themselves. They too pirouette and cartwheel into the street – a heavily bandaged man on crutches miraculously tumbles down the road seemingly uninhibited by his condition while another man jumps out of his clothes, only to see his clothes jump along the road of their own accord. Another woman dives into a water wagon, and a dog who licks the tonic becomes endowed with ever-stretching legs and empowers to chase the dog-catcher, metamorphosing into a lion, a tiger, a rhinoceros, and an elephant as he does so! The comical reversal of the dog chasing the dog-catcher is a clever ploy, but even more engaging is the use of animation to enable the dog to literally change into other creatures in order to signify his aggression and power. I will address metamorphosis as an important aspect of animation later, particularly in regard to its use as a narrative as opposed to a ‘magical’ device.

The cartoon concludes by directly referencing the style of comedy epitomised by the Keystone Cops in the silent era. Hundreds of police tumble into a tiny police patrol van – the kind of comic exaggeration common in the cartoon – but a signifier also of animation’s capacity to engage with and interrogate the viewers’ willing suspension of disbelief. As I will suggest throughout my discussion, the tension between belief and disbelief is integral to the achievement and effect of animation as a form. Here the action is taken for granted as a joke but serves to operate in other ways as the medium develops. Once the soda parlour is barricaded and padlocked by the police, Mutt finally has the revelation that Jeff has done something to the syrup fountain. Mutt sniffs the air, his nose gesture accompanied by the word ‘sniff’, and punishes Jeff by making him drink the rest of the tonic. Jeff, of course, merely fights back, leaving Mutt with stars spinning around his head, and having broken down the parlour door, he takes a piece of wood to the police in the van who flee down the street. Hurd and Barre use the speech balloon common to the comic strip for the first time in a particularly humourous way as it is the policemen who cry ‘Help!’ and ‘Police!’ as Jeff continues to attack them. In an escatolary style – later employed by Tex Avery – Jeff throws first a tyre, then a big wooden box, then the whole van, at the police, before spinning Mutt around over his head in what was later to be true Popeye style. The final gag in the cartoon also becomes one of the commonest in later Warner Brothers cartoons, when Mutt defies gravity, hovers in the air temporarily, and finally crashes to the floor with imperfect grace but perfect comic timing. Mutt’s humiliation is complete.

Disney and the realist principle

Cartoons emerged into the market place in the USA at the same time that more experimental abstract animation was beginning to surface in Europe, particularly through film-makers such as Oskar Fischinger and Walter Ruttmann. This kind of work developed from a more experimental tradition in the graphic and fine arts and, essentially, has come to represent the notion of the avant-garde in animation. I will address this tradition later in this chapter. Clearly though, animation, in whatever form and whatever context, was an expressive vehicle with Modernist credentials – simultaneously, animation was developing its own aesthetic language, and seeking new technologies to facilitate its future progress as both an industry and an art form. Donald Crafton describes Felix the Cat as ‘the quintessential cartoon of the 1920s’ (Crafton, 1993: 301) chiefly because of its growing popularity and its comic invention (see Chapter Four). Otto Messmer’s Chaplin-esque cat spoke to an American public willing to fully immerse themselves in fantasy, but a fantasy properly understood to be the product of the medium, and not merely the representation of the free imagery of a dream-state. As Crafton has noted,

Felix’s everyday world is already in excess of anything that we might find in a dream. To show him awakening at the end of a film would have been superfluous. When other animators indulged in irrational imagery, they seemed compelled to draw back from accepting its consequences. The dream-framing device, one of the most important animation codes, acts to establish the limits of rational thought. In American cartoons, as in American art in general, the demarcation between fact and fantasy was usually heeded scrupulously. Felix, however, never shies away from the irrational. He accepts it as ordinary.

(Crafton, 1993: 342)

The free agenda of Felix vehicles most often rendered the character as a heroic outsider, who, for example, in Felix Revolt (1924) becomes a political activist campaigning against the maltreatment of cats. This free expression was legitimised by the openness of Messmer’s style of animation. Felix could do anything. He was the master of both the narrative space and the graphic space. This meant that he could straddle the line between rational and irrational discourse without self-consciousness. As Crafton suggested, this was unusual in the American creative context because its very style refuted moral and ideological certainty (Crafton, 1993). Felix did not live in the ‘real world’, and thus could operate outside its moral and ideological constraints. Sometimes, Felix’s environment was significantly enough like the ‘real world’, however, for him to represent alternative and radical agendas. Animation legitimised the social and political ambivalence of such narratives by simultaneously approximating some of the conditions of real existence whilst distancing itself from them by recourse to the unique aspects of its
own vocabulary. It was this potentially subversive aspect of the animated form that was enjoyed by Sergei Eisenstein:

In a country and social order with such a mercilessly standardized and mechanically measured existence, which is difficult to call life, the sight of such 'omnipotence' (that is, the ability to become, 'whatever you wish'), cannot but hold a sharp degree of attractiveness. This is as true for the United States as it is for the petrified canons of world-outlook, art and philosophy of eighteenth century Japan. (Leyda, 1988: 21)

Eisenstein effectively equates the apparent freedom of the animated form with personal and ideological freedom. He implicitly suggests that audiences recognised that animation succeeded in demonstrating liberation from social constraint and the fulfilment of personal desire. The freedom of expression sustained in animation was essentially a utopian language, appealing because of the 'rejection of once-and-forever allotted form, freedom from ossification, the ability to dynamically assume any form' (Leyda, 1988: 21). This condition, which Eisenstein called plasmaticness, resisted being fixed and stable. In his view, this mutability, the very condition of the animated film, recalled primal states, and relocated contemporary culture within the context of its own evolutionary development. The animated film offered comfort in its unconscious echo of the evolutionary principle and demonstrated quasi-revolutionary conditions. Eisenstein felt that it was this sense of changeability and reformation that was lost in a Modernist era driven by the imperatives of the machine. Whilst Eisenstein championed the aesthetic principles inherent in the language of animation, and most particularly in Disney’s early works, Disney himself became more preoccupied with the development of animation as an industry, and most specifically in the development of new technologies. As Merritt and Kaufman note, ‘the story of Disney’s silent film career is not so much a struggle for artistic expression as it is a fight for commercial stability’ (Merritt and Kaufman, 1993: 15).

Disney established Walt Disney Productions in 1923, making his Laugh-O-Grams, which were mainly adaptations of popular fairytales like Puss in Boots, before embarking on his part animation, part live-action Alice in Wonderland films, which featured all the quasi-revolutionary form and content which so enamoured Eisenstein. This was best expressed in Alice Rattled by Rats (1925), in which Merritt and Kaufman suggest ‘Nowhere is Disney more exuberant or inventive in showing underlings gloriously taking over the master’s domain’, a condition also reflected in other Alice films in which Disney ‘shows kids cutting school, shoplifting and playing hookey, hoboes free from having to work, prisoners escaping prison, or simply Alice running away to have adventures’ (Merritt and Kaufman, 1993: 20).

In 1927 though, he began working on his ‘Oswald the Rabbit’ series of cartoons, and this may be seen as the turning point, not merely in Disney’s career, but in the development of animation in general. The Mechanical Cow (1927), the first cartoon featuring Oswald, may be seen as the moment when Disney left behind the surrealist tendencies of Otto Messmer and the Fleischer brothers, and prioritised the idea of mechanism, in regard to both form and content. His films increasingly demonstrate the relationship between the organic and the machine, a relationship that was also of paramount concern to Disney in the very making of animation. During this period, he developed ‘the pencil test’ (i.e. photographing a pencil drawn sequence to check its quality of movement and authenticity before it proceeded to be drawn on cells, painted etc.). A year later, in 1928, Disney premiered Steamboat Willie, featuring Mickey Mouse, which was the first synchronised sound cartoon. Disney then introduced Technicolor, the three-colour system into his Silly Symphony, Flowers and Trees (1932), which later won an Oscar. Disney’s concentration on innovations in the apparatus to facilitate the animated film ultimately had the consequence, however, of undermining the distinctive aspects of animation itself. Eisenstein admired Disney’s films because they represented the attempt to force ‘the self-contained objective representational form to behave as a non-material volitional play of free lines and surfaces’ (Leyda, 1988: 99). With each technical development, however, Disney moved further away from the plasmatic flexibility of many of the early Silly Symphonies, and coerced the animated form into a neo-realist practice.

Even though Disney dealt with what was a predominantly abstract, non-realist form, he insisted on verisimilitude in his characters, contexts and narratives. He wanted animated figures to move like real figures and be informed by a plausible motivation. As Disney’s studio grew and embarked on ever more ambitious projects, most notably the creation of a full-length animated feature, Disney’s animators undertook programmes of training in the skills and techniques of fine art in the constant drive towards ever greater notions of realism. Animals had to move like real animals but it was important that the complexity of this movement must be unnoticeable, a condition achieved through the dexterity of the artist’s skill in drawing the creatures. Simultaneously, the ideological freedoms of animated films displaying both graphic and narrational anarchy, gave way to the overly moral confrontations within realistic scenarios.

This level of reality was further enhanced by the development of the multi-plane camera. Traditionally, in the two-dimensional image, the illusion of perspective had to be created by the artist. As the camera approaches an image like this – for example, cattle grazing outside a farmhouse on a moonlit night – the image loses its perspective as the elements merely enlarge and the moon becomes as big as the farmhouse or cattle. The multi-plane camera stops this from occurring because the image is painted in perspective on different planes of glass that are placed directly behind each other, but have the ability to move. To use my example, the cattle would be painted in the foreground, the farmhouse behind the cattle in the field, and the moon in the background, so when the camera moves through the image, all the elements stay in perspective. Disney’s Silly Symphony, The Old Mill (1937), successfully demonstrated this technique, but it found its most advanced and persuasive use in the first full-length animated
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feature, Snow White and the Seven Dwarfs (1937). In many senses, Disney had aligned animation with aspects of photographic realism, and misrepresented the form's more distinctive characteristics.

The animated film had reached maturity, but in doing so had established Disney as synonymous with 'animation'. This has led to animation being understood in a limited way. Disney perfected a certain language for the cartoon and the full-length feature which took its model from live-action film-making. This overshadowed other types of innovation and styles of animation which have extended the possibilities of the form and enabled other kinds of film to be made. Consequently, and ironically, Disney's dominance of the medium places the issue of 'realism' at the centre of any discussion of animation. Disney rightly concluded that a full-length feature could not be sustained upon the limited premises of a sequence of gags, which, of course, characterised the animated short, but in aspiring to the conditions of the live-action feature he creates conditions by which the intrinsic qualities of animation are overlooked. First then, before I address those particular qualities, it is important to define the notion of realism in animation in order to readily perceive how the form's specific claims are measured against it.

Case study: The problem of realism

Any definition of 'realism' is necessarily subjective. Any definition of 'realism' as it operates within any image-making practice is also open to interpretation. Certain traditions of film-making practice, however, have provided models by which it is possible to move towards some consensus of what is recognisably an authentic representation of reality. This may range from the non-fiction film (i.e. travelogue, documentary etc.), through to neo-realist fictions (i.e. the films that emerged from post-war Italy or the 'kitchen sink' dramas made in Britain in the early 1960s). It may be argued that this type of apparently objective film-making is only concerned with external reality and the representation of ordinary, everyday existence. Other kinds of cinema, principally the work of the surrealists, therefore, prioritised psychological approaches, suggesting that 'reality' is a matter of how it is perceived or unconsciously mediated. 'Realism', it seems, is a relative thing, but the kind of film which seems to most accurately represent 'reality' is the kind of film which attempts to rid itself of obvious cinematic conventions in the prioritisation of recording the people, objects, environments and events which characterise the common understanding of lived experience. Any film-making practice, however, is necessarily self-conscious, and this is where any attempt to define 'reality' in the cinema comes unstuck. Principles of organisation and manipulation intervene with any notion that a film has shown unmediated reality. Similarly, any film that claims to be 'true' or merely showing the facts is probably going to be challenged on the grounds that it is 'false' or just fiction. The animated film, inevitably, complicates these issues even further.

Significantly though, animation immediately extricates itself from these kind of debates by already being a medium which is informed by self-evident principles of construction. Animation does not share the same method and approach of the live-action film. Rather, it prioritises its capacity to resist 'realism' as a mode of representation and uses its various techniques to create numerous styles which are fundamentally about 'realism'. As Eco notes, apropos of Disney's theme parks, to speak of things that one wants to connote as real, these things must seem real. The "completely real" becomes identified with the "completely fake". Absolute unreality is offered as real presence (Eco, 1986: 7). In many senses this view defines animation in general (i.e. animation is a 'completely fake' medium by virtue of the fact that it does not use the camera to 'record' reality but artificially creates and records its own), but it most particularly defines the kind of animation which aspires to the creation of a realistic image system which echoes the 'realism' of the live-action film. This, using Eco's term, is 'hyper-realism', and fundamentally defines the films of Disney, and those who emulate the studio's style. For Disney, and others working in this way, to connote 'reality', however, the construction of, and the contexts created within, the films, must necessarily aspire to verisimilitude, even when making films with fairy tale narratives or using animals or caricatured humans as the main characters.

'Realism' as I have already suggested is a relative term, but within animation it is useful to locate the 'hyper-realism' of the Disney films as the yardstick by which other kinds of animation may be measured for its relative degree of 'realism'. In other words, the animated film may be defined as non-realist or abstract the more it deviates from the model of 'hyper-realism' located in the Disney film, and principally a full-length feature like Bambi (1942), which even as ardent a supporter of Disney's work as Eisenstein found too lyrical and unrepresentative of the language of animation in which Disney's previous work had revelled (Leyda, 1988: 98-9). Consequently, the relativity of 'realism' within the context of animation may prove to be a valid analytical tool because some films may be categorised as more 'realistic' than others, or may work in a style that connotes a greater degree of 'realism' than another style etc. Informing the hyper-realist style are some key codes and conventions which enable these kind of comparisons to take place. These are:

- The design, context and action within the hyper-realist animated film approximates with, and corresponds to the design, context and action within the live-action film's representation of reality.
- The characters, objects and environment within the hyper-realist animated film are subject to the conventional physical laws of the 'real' world.
- The 'sound' deployed in the hyper-realist animated film will demonstrate diegetic appropriateness and correspond directly to the context from which it emerges (e.g. a person, object or place must be represented by the sound it actually makes at the moment of utterance, at the appropriate volume etc.).
- The construction, movement and behavioural tendencies of 'the body' in
the hyper-realist animated film will correspond to the orthodox physical aspects of human beings and creatures in the 'real' world.

Clearly, these conventions transcend the subject matter of the films and the style and techniques employed to make them. They are the codes by which verisimilitude is achieved. The more the animated film corresponds to these codes the more hyper-realist it will seem, whether it be Disneyesque in construction or like the subjective-documentary 'lip-sync' series made by the Aardman studios in England. The more an animated film deviates from these conventions the more it will demonstrate different kinds of approach and purpose. By focusing on the issue of 'realism' in animation it is therefore possible to begin the close analysis of any one animated film. Already, it is clear that the use of such conventions may determine the degree and extent of the non-realist agenda of the 'cartoon'. It is necessary, however, to interrogate this issue and establish some additional criteria by which the animated film might be analysed.

Roger Cardinal suggests 'the whole ideal of the animated film is to suppress the categories of normal perception; indeed its logic might even be to suppress all differential categories, and annihilate the very conditions of rationality' (Hames, 1995: 89). Clearly, animated films which do move towards a realist ethos have to be evaluated on other terms. Former Disney chief, Jeffrey Katzenberg says of Pochahontas (1995), the studio's most live-action oriented cartoon feature, that it is exaggerated reality, where the real possibility of Pochahontas diving 100 feet from a cliff into a pool of water may be made more spectacular if she were to appear to dive 300 feet, a feat enacted in entire safety, and with persuasive plausibility, in the animated form. At one and the same time 'the very conditions of rationality' have been challenged but made to comply to a different, yet convincing, realist rationale. It may still be the case that this perspective on realism will ultimately be unsatisfying. As Kuenz notes, a little boy watching Beauty and the Beast (1989), didn't like the supposedly happy ending, because he said 'everybody turns back into real people' (The Project on Disney, 1995: 72). In his eyes, the realist agenda was evidently an abnegation of animation's capacity to authenticate fantasy.

Importantly, though, in the case of Pochahontas, The Disney Studios felt a strong commitment to depict its lead characters as believably as possible because, for the first time in a Disney animated feature, the story was based on real-life people and events. As Peter Biskind notes, though, 'with realism, however, comes sex, a no-no in the Disney universe' (Biskind, 1995: 85), and a scene in which a topless John Smith passionately kisses the Native American Indian girl, Pochahontas, was cut as inappropriate. The limits imposed on the animation by the imperatives to achieve a plausible, yet highly selective, realism left Disney animators divided about the wisdom of undertaking the project. Glen Keane, one of the studio's leading animation directors, counters by saying, 'I disagree with the argument that if it's animation, it has to be subject matter that you can only do in animation. If that's the case, why not just have everybody stop doing landscape paintings because of Ansel Adams?' (Biskind, 1995: 85). This argument, citing Adams' photographic realism as a definitive view of landscape imagery, suggests that Disney animators believe that they do move beyond traditional modes of realist representation in their work, and maintain a hyper-realist which is neither a completely accurate version of the real world nor a radical vindication of the animated form. Andy Darley, apropos of certain kinds of computer-generated imagery, has usefully suggested that this may be defined as second-order realism, where every object and environment, though recognisably 'real', precise in its construction, and logical in the execution of its own laws, becomes essentially over-determined, moving into a realism which is simultaneously realistic but beyond the orthodoxies of realism. It may be argued, therefore, that the mode of realism in animation could be understood as over-illusionism.

Supporting this view is the idea that the principles of movement themselves are necessarily over-enunciated in the animated vocabulary. Disney's mode of 'squash-and-stretch,' animation necessarily over compresses and elongates character movement to give it an over-determined and often comic style, but it remains that moving figures within the Disney canon correspond more directly to 'realistic' movement than work informed by other approaches. Indeed, the very subjectivity involved in producing animation, as it is played out through the medium's intrinsic capability to resist realism, means that any aspiration towards suggesting reality in animation becomes difficult to execute. For example, the intention to create 'documentary' in animation is inhibited by the fact that the medium cannot be objective. Having said that, the medium does enable the film-maker to more persuasively show subjective reality. Marjut Rimmenn's film Some Protection (1987), documents the deep anxiety of Josie O'Dwyer, using her own troubled recollections of abuse, petty crime and the brutalities of imprisonment, and effectively shows the perception of reality as it is experienced by O'Dwyer. Arguably, this is a more truthful reality and one which is only possible to document in animation. O'Dwyer's view of the experiences she goes through are clearly authentic, but sometimes the credibility of the first-person address may be viewed as a questionable credential in the pursuit of documentary truth. Subjective views, opinions and recollections are the staple of many live-action documentaries but, in a medium as fluid as animation, these vocabularies more readily support a subjective approach to animated film-practice as any authored piece. Paul Vester's Abducte (1994), for example, uses recollections by people who claim that they have been abducted by aliens. Whilst being highly amusing, the idea of 'documentary' is compromised not merely by the implausible nature of the subjective voice, but by animation which uses so much imagery from the pulp sci-fi fictions like Astounding and Amazing Stories, produced throughout the 1930s and 1940s. The film certainly operates as a case in which 'realism' can only be viewed as an imaginative rather than a factual premise.

Peter Lord's Going Equipped (1989) is perhaps closer to what might be a more commonly held view of the realist agenda, using animation to emphasise the taken-for-granted aspects of the fly-on-the-wall, 'talking head', variant of documentary practice. So much so that, whilst being 'realistic', it also operates as a
perfect example of the art of acted performance in animation, which is addressed in Chapter Two. So thorough is the naturalism that the film almost begs the question of why it was necessary to animate the work and not merely see it in live-action. The animation does draw the viewers’ attention to significant, and sometimes unnoticed aspects of the character, however, and once more demonstrates its usefulness as a different medium. Such work, which so aspires not only to naturalistic representation but to the engagement with social reality, may be usefully termed ‘animation with documentary tendency,’ the first example of which would be Winsor McCay’s ‘The Sinking of the Lusitania’ (1918) which, ironically, still fits in with McCay’s fundamental working premise of animating subjects would could not possibly be filmed. The quasi-newsreel ‘feel’ of the piece is powerful and emotionally affecting, but it is as much allied to autobiography and propaganda as it is to the realist mode required for documentary.

Indeed, it may be suggested that Tex Avery’s mock travelogues, like ‘Cross-Country Detours’ (1940), or Disney’s quasi-educational films like ‘Jack Kinney’s How To...’ series, featuring Goofy, also demonstrate the documentary tendency, only to subvert their informational or instructional tone by the use of cartoonish humour. Interestingly, a number of Disney shorts allude to the documentary tendency, or the realist mode, to authenticate certain ideological or didactic principles. A sequence from ‘Bambi’, one of Disney’s most hyper-realist features, for example, was released in 1978 as an educational short called ‘Bambi – A Lesson in Perseverance.’ The realistic attempts of Bambi to stand up and walk are indeed over-determined, but the sequence only moves beyond realist orthodoxies through the anthropomorphised exchanges between the animals. Ultimately, most attempts to engage with the documentary tendency result in what Jan Svankmajer has called ‘Fantastic Documentary’ (Hames, 1995: 112), which are works based in reality, but which reveal intrinsic truths through the machinations of animation used as a subjective tool. Reality in animation, therefore, can only be a comparative and relative form, half-dedicated to representational authenticity, half-dedicated to the narrational forms which heighten and exhibit the fluid conditions of the real world.

**True animation?**

No animation film that is not non-objective, non-linear can really qualify as true animation, since the conventional linear representational story film has long since been far better done in live-action.

(Morić, 1988: 21)

Film historian, William Moritz, here defines what may be regarded as a purist view of what properly constitutes ‘true animation’. Clearly, he is suggesting that the animated form is best represented by the creation of films which concentrate purely on using and developing the unique vocabulary available only in animation which, therefore, distinguishes it from any other style or approach to film-making. This effectively locates animation as an experimental or principally avant-garde form of expression. Further, it suggests that animation works best as an abstract form, where it fully demonstrates its intrinsic capability of moving non-representational lines and materials which fall outside the orthodox domains of ‘realist’ constructions and agendas. Animation of this sort may be recognised as more specifically bound up with the desire to express profoundly personal, sometimes conscious, sometimes unconscious, aspects of human thought, feeling and experience. The liberating freedom of the medium has a direct correlation with the variety of work achieved by certain animators and artists, who are not merely seeking to find the most appropriate means by which they express their vision, but to progress the medium itself.

New Zealander, Len Lye, for example, used batik methods directly on film, influenced by his belief that the forms of aesthetic expression exemplified in the art of primitive cultures were more directly in touch with the actual neurological and physiological experiences of humankind. He believed that the lines and shapes painted on walls or etched in pots and vases were the direct expression of primal feeling, and thus sought to replicate this approach in both his sculpture and his film-making. His last film, ‘Particle in Space’ (1979), is an attempt to project the cellular life of his brain and body directly onto film, in the hope that its distinct pattern and movement was a document of the dissolution of his neuro-physiological state as he neared death. Norman McLaren worked in a similar way, but with more cheerful intent, in a film like ‘Boogie Doodle’ (1940), in which he literally painted on to the cells of film in response to the boogie-woogie piano of Albert Ammons. This approach places the emphasis and purpose of the expression itself in the realm of the body’s actual physical life, and more on the unmediated emergence of unconscious forms of response to external stimuli. McLaren’s lines, shapes and patterns correspond to the syncopated beat and rhythm of a boogie tune, colliding, conjoining, expanding, contracting, speeding up, slowing down, changing in tone and definition, resisting any coherent mode of narrative representation, yet somehow expressing a mood, an idea, an experience.

Most notable in this field of non-objective, non-linear expression is Oskar Fischinger, whose initial designs and animation were used to complement Bach’s ‘Toccata and Fugue in D Minor’ in Disney’s Fantasia (1940). Fischinger later left the project, feeling that his individual approach did not fit the studio ethos. This is hardly surprising, in the sense that while Fantasia was clearly Disney’s attempt to legitimise the animated film by working in a more abstract, highly aesthetic, supposedly ‘cultured’ way, it did not properly encompass Fischinger’s vision of purely visual music. Once again, like Lye, Fischinger recognised animation as a form which could accommodate fluid, primal, expressions of thought and feeling. His desire to synchronise music and movement was primarily driven by his view that music questioned the abstraction of sound. It was merely accepted for what it was, stimulating its own associations and reactions. Fischinger felt that this could also be achieved in purely visual terms. Shapes and forms need not represent anything real and would provoke a variety of responses in the viewers who received them.
By directly synchronising music and movement in his 'Studies', made during the 1930s, and most notably in Composition in Blue (1935), Fischinger hoped, however, that the accepted abstraction in the music would enable the acceptance and understanding of abstraction in the animation. Such abstraction was further systematised in the rhythms and repetitions of Victor Eggling's films which more closely approximate to programmed patterns of construction and deconstruction, and are clearly informed by logical schemata and almost mathematical precision. A film like Diagonal Symphony (1925), which works entirely on the basis of a formal geometric pattern constantly mutating in part-organic, part-mechanistic fashion, anticipates similar constructions in contemporary computer animation by more than fifty years.

While these achievements are startling, and fully demonstrate the range of possibilities in animation, they are, in many senses, difficult to relate to and even harder to understand. Even innovators like John and James Whitney, who, in the 1940s pioneered the first examples of quasi-computer animation, and who had a distinct approach to the idea of visual music in addressing the emotional implications of abstraction, produced work that was not particularly accessible. James Whitney, especially, had a particular interest in allying spiritual themes to his film-making practice. His film, Lapis (1965), is named after the philosopher's stone in the practice of alchemy and encourages notions of contemplation and a fuller understanding of the place of humankind within the cosmos. The film, a relaxing, visual tour de force of fluid particle movements, is entirely composed of hand-drawn dots, and it is in this that the viewer may find a point of access to the modes of expression and intended meaning. All of the artists cited above sought to work out of more primitive forms, and thus have a specific understanding of how these forms evolved, and what they ultimately represent. It is useful, therefore, to consider the specific vocabulary these artists are primarily working in as animators.

What, for example, is 'a dot'? It might be the beginning of a line, the end of a line, a mark in space, a point that designates perspective etc., but more importantly, it is the smallest, most direct, completely determined, graphic mark that the artist can use. In other words, it is the primary, most intense symbol of expression that relates the artist to the artwork. The dot is a primal form that is only rationalised as a geometric form much later in its application. This is the case for all of the orthodox shapes and forms:
ANIMATED FILMS

<table>
<thead>
<tr>
<th>Primal form</th>
<th>Geometric form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point (dot)</td>
<td>Point/points with specific meaning</td>
</tr>
<tr>
<td>Scratch</td>
<td>Straight line</td>
</tr>
<tr>
<td>Wavy line</td>
<td>Grids/nets</td>
</tr>
<tr>
<td>Spiral</td>
<td>Circles</td>
</tr>
</tbody>
</table>

The method of graphic expression which merely uses primal forms is concordant with the animator’s atavistic intentions. In other words, the approach, and its subsequent achievement is a direct attempt to get in touch with different kinds of expression which precede Formalism. Sergei Eisenstein suggests that ‘heartless geometrizing and metaphysics...gave rise to a kind of antithesis, an unexpected re-birth of universal animism’ (Leyda, 1988: 35). Animism, a concept which may be defined as a pre-rational, pre-scientific state of relatedness to the organic inter-connectedness of the natural world and primordial conditions, may be seen to inform the kind of animation which prioritises subjectivity and resists orthodox modes of representation.

The first acts of animist animation come in the form of cave drawings, in which expression is not a consciously creative act but an automatic physical engagement which reveals hand/eye co-ordination and the ability to affect a stroke-drawing or mark (Leyda, 1988: 43). This physical act may be defined as the mechanism which enables humankind to draw, even in the most crude terms, and demonstrates that ‘drawing’ itself is, in Eisenstein’s words, ‘brought to life’ (ibid. 43) operating outside the constraints of representation. It is clear then, that animation intrinsically provides the opportunity to express the life within drawing/sculpting etc. on its own terms, before expressing the obligation to narrate or make representational associations. It may be argued that this kind of artwork corresponds to sensual rather than rational interpretation, prioritising an active engagement with the pre-logical. Significantly, Eisenstein suggests that the key agenda of these primal forms is the idea of something that is coming into being (ibid. 69) and it is in this state that the artwork is at its most expressive. He fears, however, that the imperative which insists upon exactitude or absoluteness, or in his word, generalisation, will finally render the artwork inexpressive (Leyda, 1988: 82).

Primal forms exhibit simplicity without overt meaning; geometric forms rationalise lines and shapes in a way which universalises graphic expression and moves it towards particular codes and conditions of interpretation. The tension between these two polarities is resolved in an experimental film by Hans Richter called Rhythm 21 (1921), of which he says: ‘I used the square (or rectangle) as the simplest way of dividing the square film-screen, after I had discovered that our scrolls were paintings and followed the laws of painting not of filming. The simple square gave me the opportunity to forget about the complicated matter of our drawings and to concentrate on the orchestration of movement and time’ (Russett and Starr, 1976: 49). Crucially, this simple decision delineates another way in which these abstract films may be addressed. If atavistic expression prioritises the free movement of the primal form, and the act of coming into being, Richter’s animation rationalises it to the extent to which the free play of abstract forms may be understood through the division of space. Such division enables the viewer to comprehend the relationship between oppositional ideas and contexts, i.e. the play from right to left and left to right; the play between above and below; the tension across the diagonal or foreshortened spaces etc. This may be extended into an interpretation of forms in relation to light and dark, or even the gendering of lines and shapes, if the viewer accepts a tension between masculinity as vertical and femininity as horizontal. Immediately, the vocabulary of possible access is extended.

Computer animator, Larry Cuba, calls this general principle of abstract expression within a particular spatial context, ‘design in motion’, and stresses the importance of the apparatus with which he is working. He says:

If you think about the process used in abstract animation, it does become important that you're using a computer, in a way it affects your vocabulary. Because if you start with these mathematical structures, you can discover imagery that you've not pre-visualised but have 'found' within the dimensions of the search space.

(Russett and Starr, 1976: 28)

Cuba effectively articulates how new technologies help to create greater expressive freedom within apparently fixed mathematical and geometrical structures. Suddenly, unanticipated ‘found’ relationships between shapes and forms within the computer program create aspects of the ‘pre-visualised’ in ways that echo the primal spontaneity and expressiveness cited earlier. This clearly demonstrates that the tension between: conscious and unconscious creation; primal and rationalised forms; and the movement between non-representative and associative images, remains in place whatever the means of creating abstract animation. The concept of ‘the dimensions of the search space’ described by Cuba is of further use, however, in suggesting ways in which the animator uses a particular context, drawing the viewers attention to: the size and shape of forms; their graphic and technical quality; their rhythm and counter-rhythm; their symmetry or asymmetry; their movement towards, or away from, the edge or centre; their relationship and effect upon each other, and perhaps, most importantly, their openness or closure as a form. By addressing these aspects of abstract animation it is possible to create a variety of ways in which non-linear or non-objective works can be narrated.

As animator, Alexander Alexeieff has noted, it is the imperative of such works to engage the spectator’s imagination and sensus apparatus at a different level, and to provoke the recall of physical movement and playfulness in childhood (Russett and Starr, 1976: 94). This idea best exemplifies the purpose of the abstract film and once more calls attention to the space between the representation/figuration and abstraction/decoration. Once primal forms become geometric they become familiar, rationalised, and narrowly symbolic. By
2.1 A thaumatrope: This 1826 French engraving shows how to spin a thaumatrope and it also suggests the device's effect. In this case, one side of the disc bears the image of a bird and the other side carries that of an empty cage. The superimposed image is created, of course, only when the device is being spun between fingertips.

**THE THAUMATROPE**

Animation prehistory begins with a simple device named the thaumatrope. This optical toy was in wide circulation in the early nineteenth century, and it may have been known far earlier than that.

The toy is simplicity itself: a disc that is attached to two pieces of string. When the disc is twirled by the operator's hands, images placed on either side of the disc are perceived together as a single image (Figure 2.1). Twirling the disc superimposes images upon each other by means of a perceptual phenomenon known as the persistence of vision. Our eyes hold on to images for a split second longer than they are actually projected, so that a series of quick flashes is perceived as one continuous picture.

Using a piece of heavy cardboard and some string, you can re-create the bird-and-cage effect or try out something more personal.

**Project: Plastic Surgery.** Locate a black-and-white photograph of yourself, not more than a couple of inches in length and width, in which your head is fairly large within the frame. Center your image and then cut this out and mount it on a piece of round cardboard. Punch two small holes at the opposite edges of the disc and attach a string to each. Design a number of alternative images to be attached to the reverse side of your thaumatrope: a beard, a scar, a hat, a mask, a missing tooth, or whatever else you'd like to superimpose on your own face. Try different effects using colors. See what happens when you place the photograph of a whole star on the opposite side. Twirl up a storm.

**THE PHENAKISTOSCOPE**

In 1832, a native of Belgium named Joseph Plateau invented a new machine that really created the illusion of sustained movement. His invention, the phenakistoscope, is a spinning disc that bears a series of drawn images and viewing gates in which the viewer's vision of the drawings (Figure 2.2).

**Project: Mirror Movies.** In Figure 2.3 you'll find a one-to-one ratio pattern for creating your own phenakistoscope. Draw or construct a full-size version, 9 inches in diameter, and attach it to a spinning surface. After cutting viewing slits at the indicated locations, place something in the twelve frames outlined on the back, and place the stylus. Note that you can actually try two different discs for Plateau's phenakistoscope: A simple wooden handle was used to hold these discs as the viewer spun the wheel while facing a mirror and sighted through the slits in the disc's surface. The old etching, (A), shows a variation of the phenakistoscope. To operate this device correctly, the viewer positions an eye close to the surface with slits. As the disc is spun, the animated movement is perceived by sighting through the series of slits to the series of drawings beyond. Plateau's fascination with mechanical movement is apparent in that moving machines provide the "content" within two of his discs. (B). Courtesy Stanford University Art Museum.
2.3 *Phonakistoroscope* stylus: The particular configuration of twelve wedges seems to work well, but you are encouraged to experiment with other formats. Use the sections marked a for one set of drawings and the sections marked b for the second set. Inside the stylus (which has been reduced in size) are three possible drawings you might want to try: a sports car that zooms through the frame; an airplane that flies directly at you; and an exotic plant that you can make grow. The finished phonakistoroscope (cut from cardboard or another heavy paper stock) can be mounted onto a pencil by securing its center to the pencil’s eraser with a pushpin. Go to the mirror and watch the drawings come alive and move at various speeds.

**THE ZOETROPE AND PRAXINOSCOPE**

It wasn’t long before a new generation of inventors refined and extended Mr. Plateau’s device. Among the most ingenious of the new toys were the zoetrope and the praxinoscope. Both machines provided more convenient projection devices for their drawings. Both extended the number of drawings that could be used—and hence the duration of movement itself.

The zoetrope is a revolving drum that has slits in the sides, spaced equally. By looking through these slits as the drum is spun, the viewer is able to catch glimpses of a series of drawings that have been created on a strip of paper and then placed inside the drum (Figure 2.4). The larger the drum’s diameter, the longer the “movie,” and, of course, the same drum could present different strips of drawings. Incidentally, the machine’s name means “wheel of life.” It was so titled by Pierre Deygnes in the year 1860, although earlier versions of the same basic device had been developed in England by William Horner around 1834.

The praxinoscope represents a refinement on the zoetrope. The slits are replaced by a set of mirrors that spin in the center of the drum. You can try to make your own version of the prism device by using a shiny plastic material, which is available in art stores. The finished mirror structure is placed over the spindle of a record player. When the machine is turned on, the outside band of images is animated as one looks into the revolving mirrors. The same drawings you have made for the zoetrope can be modified for use in a model praxinoscope.

The inventor of the praxinoscope was Émile Reynaud, and in 1892 he opened the world’s first movie theater in Paris. Reynaud’s *Théâtre Optique* projected a “movie” that was
FLIP-BOOKS

Remember those animated drawings you did as a kid on the dog-eared edges of a textbook? By flipping through the pages, you could make the characters or the design move. Sometimes you could buy a small flip-book at the local novelty store, or you'd discover one already created in a comic book, or get one as a Cracker Jack prize.

Flip-books also invite comparison with the technique of cel animation, one of the most sophisticated of all animation techniques. Each page in the flip-book corresponds to an individual frame of animation. Each page is then placed on the flip-book stand, and the pages are turned to make the image appear to move. This is a way of keeping things precisely sequenced and lined up — a way of keeping things precisely sequenced and lined up. The flip-book is then turned to make the drawing move. The act of thumbing through the pages of the flip-book is the act performed by the reader. The reader, by thumbing through the pages, is the reader who is the reader who is animating the drawing.

The quickest and easiest way to make your own flip-book is to purchase a set of unlined pages of white paper. A convenient size is 5 by 7 inches, although smaller 3- by 5-inch cards also work. You'll find these pads of paper at a good stationery store. With one of these pads of paper, and a pencil, you're ready to start.

The first drawing is made on the first page of the flip-book. When the next page is turned, the drawing is moved forward by the thumbing action. Each page is drawn on the flip-book stand, and the pages are turned to make the image appear to move. The flip-book is then turned to make the drawing move. The act of thumbing through the pages of the flip-book is the act performed by the reader. The reader, by thumbing through the pages, is the reader who is animating the drawing.

The process of completing a drawing, covering it with a new sheet, redrawing, recovering, and so forth is continued until you work your way to the last page of the flip-book. To see the results of your labor, hold the book in one hand so that you can flip through the pages, back to front, with the other hand.

Standard index cards provide a superior alternative to the bound pages of a small notepad. The drawing technique is similar. With index cards a register system is achieved by lining up the cards as you draw, one on top of the other. Index cards are thicker than regular paper. This makes them flip more efficiently, but it also makes them more difficult to see through as you draw one image on top of the preceding one. To remedy this you may want to make yourself a light table. This consists, very simply, of a piece of transparent or translucent glass or Plexiglas on which you draw, with a bright light projecting upward from beneath this surface, making it easy to see through a number of index cards or pages of regular paper.

Index cards provide greater flexibility than notepads. For one thing, you can easily throw away a particular drawing without weakening the binding. Similarly, you can insert one more card to determine that you need more drawings to smooth out a particular movement. Most important, index cards allow you to reorder the sequence of a finished flip-book. This means that you can rearrange a finished flip-book in such a way that it is viewed from front to back. Between showings of a flip-book, the rubber band will hold the cards together. With either pads or index cards, you have some options. You may want to draw whatever it is you want to put on the flip-book. Figure 2.7 shows two common placement systems. The first system, and aesthetically, there seems to be very little difference between the two. However, if you think you may ever want to cut one of your flip-books, you should work in a ratio of 4 to 3. This is the standard portrait ratio used in movies and television, and computer screens.

Circle Book: Using either a pad or index cards, you can vary the theme or subject of your flip-book by changing the circle into another object—for example, a house into a set of lips. And in the following section, you'll get back to the original circle. But as you

2.6 Previewing a flip-book: A finished flip-book with many pages is being flipped by its creator, George Griffin. This way of holding and fanning the pages will work with almost any kind of flip-book.

2.7 Two flip-book formats: The scale and dimensions here are highly arbitrary. Flip-book (A) uses a #20 (small) binder clip to hold its pages firmly. One's hand can perform the same function. Flip-book (B) is stapled in the center. This arrangement creates twoondrawable, flippable surfaces on the same set of stapled pages. Select a paper stock and a size of drawing that will suit your preferences and resources.
2.8 Flip-book as film and publication: These drawings represent part of the actual layout prepared by independent animator George Griffin for formal publication of one of his flip-books.

2.9 Frame lines: The frame lines are indicated by the arrows and dotted lines. They go straight across the film. Sometimes you may be working with leader that has only one set of sprocket holes. Location of the frame remains the same.

do this, follow a different route from the one you took in the first twelve drawings. You might, for example, have the lips blow out a bubble-gum bubble that grows until it bursts the lips and becomes the same size as the original circle.

If you follow these directions, you will have a movement in twenty-four drawings, from a circle to something else to a circle again. Now repeat this process a second time, going to a different shape or object before returning on sheet 48 to the original circle. When you flip the completed book, you should see a movie that, while it lasts just a few seconds, creates a clear visual “beat.” Do other variations within this basic structure and add these to your flip-book. Vary the amounts of movement between drawings and the degree of complexity of the transformations. Add color. Try having a number of things happening at once.

Sneak preview. Save these first flip-books. Later with an animation camera or with a computer and scanner, you will be able to turn them into movies. Instead of appearing as cramped drawings on small pages that are flipped with unavoidably irregular speed, these flip-books can be produced into real movies, huge in scope, gracious in form, unfettered in presentation.

CAMERALESS FILMS

You can make your own animated films without a camera and without photographically developing the film itself. This is the technique of cameraless animation often called “scratch the doodle” filmmaking. It’s a good place to begin your exploration of animation. It is cheap and fast. Few tools are required and you can see the results of your work immediately.

But there are more important reasons why cameraless animation is the best place to start working with actual film. First, the technique allows you to get to know the size and characteristics of the celluloid strips that comprise the physical material known as film. Second, drawing on film gives you a good area for experimentation with the perceptual phenomena that allow the movies to “move.” Finally, cameraless animation is relatively simple. You don’t need any previous experience or knowledge to create your very first world premiere.

A friendly warning: Although cameraless animation is simple, the technique is deceptively difficult to master. If you want to fashion a film that really works, you will need to do a lot of experimentation and try a number of different ideas of working.

Leader is the term given to a strip of celluloid film with a photographic image on it. Lay the clear leader out on a flat surface, draw directly on it and, presto, you’ve made an animation film. Most often, 16mm film is used for cameraless animation. It is easily available, inexpensive, and the surface is smooth enough to permit control.

Leader comes in various diameters, but if you choose a 16mm diameter clear leader comes with either one or two sets of sprocket holes running along its outside edges. It is available single perforated and double-perforated in both cases. The single-perforated type is recommended. It makes it easier to determine on which side of the film you are working. If you draw on the “wrong” side, your animation will be reversed.

Please note the important facts that you need to know
before attempting your first film. The first has to do with projection speed. At normal sound projection speed, 16mm film is projected at a rate of 24 frames per second (fps). The standard projection speed for super 8mm film is 18 frames per second. In the discussions that follow, I'll be talking about 16mm leader and the normal 24-fps speed.

Frame lines are another important concept. You will need to know where a single image or frame is placed on a strip of 16mm leader. The frame lines that mark off the area of the film that is actually projected are to be found crossing the width of the film opposite each sprocket hole.

Among the drawing materials that work well for marking on the acetate surface are felt-tipped pens. Make sure your markers adhere to the acetate base of 16mm clear leader.

Many of those that promise to write on " anything" don't. Grease pencils work too. Because they are not completely translucent, grease-pencil colors are muted when projected. There are some kinds of paints that will work well on acetate. But you will have to do a test or two to determine how these paints hold up. On drying, some paints crack and flake off the film. This can dog the gate of the film projector and necessitate careful cleaning after every use. There are also special ingredients that can be applied to the leader with either brush or pen. Check with your local art supply store.

PERSISTENCE OF VISION

One of the first things you will need to know as an animation artist is, quite simply, what the human eye is capable of seeing. Quite obviously, everything in animation depends upon the viewer's recognition of an image and his ability to follow movement.

The moving pictures of film don't actually move. All you have to do is look at a piece of film and you'll be reminded that, in fact, the medium is made up of a series of stills. It is the human eye and brain that make movies move. More accurately, the illusion of movement on film is created by a physiological phenomenon called the persistence of vision, mentioned earlier. When a single image is flashed on the retina, the brain retains that image longer than it actually is on the retina. So when a series of images is flashed

2.11 Work on 16mm leader: From left to right, the samples show two abstract ways of drawing on clear leader without reference to frame lines; an abstract technique that uses a stamp cut into a pencil eraser; an abstract treatment in which the entire surface is colored and then decorated: a carefully registered sequence in which a star grows larger and smaller; a representational narrative (a speedboat pulling a water skier), a registered series of abstract graphic forms that are scratched from black leader; two more examples of black leader with abstract patterns scratched onto the emulsion; and, finally, a piece of clear leader with the word end.
2.12 Drawn-on-glass sense. This photograph shows 4½ frames from Uncle Sugar's Flying Circus, a 2½-minute film produced without a camera by independent film-maker Warren Bess. In addition to drawing with markers directly on clear leader, the techniques employed include hole punches, transfer-type printing black-and-white images onto color film stock using color filters, alternating black and clear frames, and punching images out of a 35mm slide and taping them with Mylar into holes punched in the 16mm leader. Courtesy Warren Bess.

FRAME-BY-FRAME STYLE

The second general style of marking on clear leader is centered upon using the frame lines. By modifying the shapes or the positions of images that are repeated on subsequent frames, the illusion of motion is created when the film is projected. Some samples are provided in Figure 2.11.

An important point to remember when you are drawing in this manner is that the individual frames are very small. Your working surface is much smaller than the smallest postage stamp. Its actual dimensions are six sixteens of an inch wide and five sixteens of an inch high. Remember these four elements as you try to create a recognizable image and then repeat it, with slight variations, frame after frame.

Simplicity. Reduce whatever it is you are drawing to its absolute minimum of details.

Tools. If you're working representationally you will need drawing implements with fine points. A pen that leaves ink drops, for instance, is useless. A good magnifying glass can help correct your marking tool.

Motor Skills. To a large extent, success in working representationally depends upon your own personal abilities as a draftsman. Physical control must be very exact.

Registration. In order to have the drawings appear to move consistently and somewhat smoothly, it is important to devise a system that gives you the ability to place each individual drawing in just the right place on each frame.

REGISTRATION DEVICES

This last item may very well be the most important. Fortunately, you can create a device that will help you achieve some measure of accuracy in placing one drawing in the proper relationship to the drawings preceding and following it. The need for registration is basic to all kinds of animation. Different techniques require different ways of registering the positions of camera and object. For cameraless animation, there are a variety of registration systems that can be used.

Graph Paper. Place your clear leader on a piece of graph paper and use the existing grid lines to help match specific places on one frame with those on the following frame. The sprocket holes are used to establish standard reference points to the graph paper beneath the film.

Discarded Film. Place the clear leader on top of a piece of discarded 16mm film that has been photographically exposed and developed in the normal way—that is, used film. Line up the sprocket holes as you begin working. You will discover that the "old" image gives adequate reference between one of your doodles and those preceding and following it.

Hand-drawn Registration Chart. Before you start working, place a short length of 16mm clear leader on a piece of white paper. With a pencil or pen, trace the outline of the film's edges and sprocket holes. Remove the leader. Draw a series of horizontal lines to show the frame lines crossing the film's surface at each sprocket hole. Draw one or two vertical lines down the length of the film tracing parallel to both edges of film. Finally, you can make two diagonal lines that intersect each frame. The result of all this measuring should be a series of frames that are exactly like each other. You place your leader over this chart as you draw, successively moving the film up onto the chart as the work continues.

2.13 Work on black leader. Two film clips from Pierre Herbart's Op Hop suggest the strong shapes and sharp edges that can be explored through scraping off the emulsion on black leader. This film was done in 35mm format, allowing the artist a larger working surface and therefore greater control. Courtesy National Film Board of Canada.
SCRATCHING ON BLACK LEADER

Using the same general techniques and knowing the same basic facts, you can create a different kind of cameraless animation by using black leader instead of clear leader. Black leader (often called camera leader or opaque leader) is readily available from film laboratories or equipment sales/rental outlets.

It is easy to get a sharp, clean, thin line by scraping off the black emulsion (Figure 2.13). The resulting white lines (when projected) can be easily colored with felt-tipped pens and many people find that the results are the most pleasing form of cameraless film. In "scratch" films, the screen is black except for the images that have been etched onto the surface of the leader. The problem, of course, is that it's far more difficult to get accurate registration with black leader than with clear leader.

Scissors, straight pins, or any other sharp, pointed object is good for scraping off the emulsion. The first time you try this technique, be sure to test both sides of the leader to determine which has the emulsion coating. Otherwise you can scrape and scratch all day without producing any clear space through which the projector's light will pass. The most effective tool for scratching on black leader is a silk-screen line cutter, a sharp metal loop attached to the stem of a paintbrush.

PROJECTING CAMERALESS ANIMATION

Cameraless animation requires a lot of working time and yields relatively little viewing time. Here are some hints on how to stretch out the screening of your films and, in the process, extend their impact upon an audience.

Loops. If your piece of finished film is not too long (between 5 and 15 feet), you can thread it through the projec-

2.14 35mm camemless animation: The size of a 35mm frame allows one to work with more detail than could be undertaken in 16mm format. Here are some samples of experiments by the author. Top left: a 16mm reduction print taken from the same series of 35mm hand-drawn films; a cartoon sequence drawn onto clear leader; a series of tracings from small photographs; drawings added to a "found" piece of film from a 35mm television commercial; abstract series of circular shapes on clear leader; and designs scraped into the emulsion on black leader.
tor in a way that allows it to repeat itself continuously without rethreading. First thread the film normally and allow the front end to run out of the machine for 3 or 4 feet. Stop the projector. Take the front end (the "head") and spike it to the rear end of your move (the "tail"). You will have to manually feed the film out the rear of the 16mm projector and into the front so that the film doesn't snarl up or touch the floor.

Silent Speed. The universal speed for 16mm sound films is 24 frames per second. This is an international standard. It is the slowest speed at which a film's sound track can move and still generate reproducible sound through the projector's amplification system. But many 16mm projectors are equipped with a switch that allows them to operate at a silent speed of 18 frames per second. At this slower speed our persistence of vision still works, so that visual continuity is maintained. When you project your camerless film at silent speed, it takes longer going through the machine and hence it takes longer to see.

The difference between 18 and 24 frames per second may not seem significant, but it is. This reduction in projection speed will add one fourth more time to a film's running time. A 15-second film at sound speed will run 20 seconds at silent speed. The difference is significant, at least to the artist.

Forward/Backward. Another way to extend the viewing experience is by projecting film in reverse. Most 16mm projectors have this capability. Simply thread and run the projector normally and then, when the last frame of your work has been

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2.15 Norman McLaren's work:
Although other artists had worked directly on film before him, Norman McLaren is recognized as the primary exploiter, refiner, and popularizer of camerless animation techniques. This series of stills shows his work and that of Evelyn Lambert, a colleague at the National Film Board of Canada. (A) shows McLaren painting directly onto a strip of 35mm clear leader; (B) shows Lambert applying patterns to the film's surface with ink and roller; (C) and (D) show frame enlargements from Begone Dull Care, a clear and opaque frame respectively. Courtesy National Film Board of Canada.
exposed, shut off the projector, put it into reverse mode and see the entire film again, back to front. You will need at least a 3-foot tall on your film so that it doesn’t come undone or pass through the projection gate before you reverse the projector.

Musical Accompaniment: Whenever you can, play music as you screen your cameraless animation. It’s weird to discover that no matter what kind of what tempo of music you select, it always somehow seems to work with the visual segment. And if you experiment with enough different music tracks, you’ll come upon one that will appear to have been made just for your film. Prerecorded audio may be the easiest way to provide musical accompaniment to your movies. But it is also valuable to try creating your own original tracks to go with these movies.

**35MM CAMERALESS FILMMAKING**

Take a look at the pieces of 35mm film printed in Figure 2.14. Next to all those 16mm frames you’ve been studying and working with, it will look pretty big. A gracious landscape indeed. Because it’s so gloriously large (to the animator, at least) 35mm clear leader is the most effective and luxurious medium for creating drawn-on-film images and sound tracks. Anything that can be done on 16mm leader can be done better on 35mm leader because the larger size affords greater control, greater detail, and greater ease in drawing.

The primary developer and popularizer of hand-drawn films is the Canadian filmmaker Norman McLaren, who has worked for more than thirty years at the National Film Board of Canada. McLaren’s wonderful movies are now commercially available, and prints of them exist in most school and public library film collections.

Because of the size of 35mm film, it is helpful to use an accurate registration system when you want to repeat or vary slightly an image from one frame to the next. Working carefully, you can draw a registration strip by hand, making a series of frames carry the same visual patterns and then placing a piece of fresh leader on top of the grid system as you work. A better system is to get hold of a piece of 35mm film on which a grid has been filmed. You can use any piece of used 35mm film with whatever image exists as a registration guide.

2.16 A Tony Eastman workout: On the facing page is a do-it-yourself project designed by New York character animator Tony Eastman. Here Tony helps us see what a mistake it is to think that a progression of animated images must evolve gradually. Although the thirty poses in Slipin’ and a Slippin’ may seem pretty disconnected, the human eye has a powerful ability to merge them into a single fluid action. To prove this is so, you’ve got to follow the directions and turn the page into a flip book. If you can, try to output this full-page image onto a paper stock that has more than the ordinary thickness (you can use old-fashioned copper technology or you can scan the image and print it out on a computer printer). After you have studied the flipbook forward and backward, you might even want to try adding some “in-between.” Chapter 14: Line and Cell Animation, will give you a structured introduction to the not-so-mysterious techniques of character animation. Reproduced with the permission of author Tony Eastman and Metropolis Graphics. Originally appears as one of a series of flip books published by Metropolis Graphics.
The use of 35mm clear leader makes it far easier to create and control a handmade sound track. Here is Norman McLaren's own description of the technique he invented.

"I draw a lot of little lines on the sound-track area of the 35mm film. Maybe fifty to sixty lines for every musical note. The number of strokes to the inch controls the pitch of the note: the more, the higher the pitch; the fewer, the lower is the pitch. The size of the stroke controls the loudness: a big stroke will go 'boom,' a smaller stroke will give a quieter sound, and the faintest stroke will be just a little 'm-m-m.' A black ink is another way of making a loud sound, a mid-gray ink will make a medium sound, and a very pale ink will make a very quiet sound. The tone quality, which is the most difficult element to control, is made by the shape of the strokes. Well-rounded forms give smooth sounds; sharper or angular forms give harsher, harsher sounds. Sometimes I use a brush instead of a pen to get very soft sound. By drawing or exposing two or more patterns on the same bit of film, I can create harmony and textural effects."

In order to project camerless 35mm film it is necessary to have it optically reduced by a laboratory to a 16mm format. And 16mm can even be reduced to a super 8mm format, assuming, of course, that you don't have access to a 35mm projector—the kind of jumbo machine that you see in commercial movie theaters.

Reducing the film is a relatively simple process but requires a laboratory with special facilities. Be certain to check with your lab before you undertake a 35mm project. You may need to send your finished film to a lab that specializes in such work.

3. Tooling Up

A general introduction to filmmaking and computer tools is all that remains before you're ready to begin making animated movies, videos, and computer creations. This chapter will do just that, and quickly.

To get things under way, I'll first preview the basic film hardware you'll need to be familiar with. Then I'll go over the basic computer hardware. Between the two you will get a useful introduction to the various pieces of gear required for almost all of the techniques described in the chapters to come. The goal here, however, is only to orient the reader. A far more comprehensive and detailed description of equipment will be found in the seven chapters of Part III: Tools. Let me say again that I strongly encourage you to flip forward whenever you have a specific technical question, need further information about a particular tool, or are just plain curious to know more.

THE BASIC FILMMAKING SETUP

Camera. A motion picture camera must have two features before you can animate with it. First, it must have the capabili-