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DESIGN IN MOTION
AN ANIMATED STUDY

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June 3, 1968Advisor, Prof. Hans Barschel
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Introduction

Statement of Thesis Proposal

I. Purpose:

The purpose of this thesis is to explore the medium of animated film and its possibilities for a wider application in graphic design.

II. Scope of Thesis:

I wish to use the animated media to produce a film controlling motion and change in graphic design. This will be used as a study of the particular effects of shape and color, as well as those of speed, rhythm and length of motion. With this media I feel I can control the way an audience sees and make a study of the effectiveness of certain techniques.

III. Procedures:

(1) The building of an animation stand to hold the camera and artwork.

(2) Production of a test film to check alignment and correct color exposure.

(3) Production of a 6 to 10 minute design animated film with sound track on tape.

(4) Write accompanying paper explaining step by step procedure and expected results and a questionnaire to be
given to the audience upon presentation of the film to check their reaction.

(5) A report on the expected and actual results of the study.

Feb. 20, 1968

Restatement

In the process of producing my film study, I found that there is much to be considered in the production of an animated film of the nature I described. The emphasis of this thesis is then on the potential of animation as a media for the artist and the problems that must be overcome when it is used. My intention is to show that the potential is great, that the problems are soluble and to give an idea of how they may be solved.

It is no longer my intention to carefully study the reaction to different effects produced on the screen, but to produce them with a stated, desired effect. The results, successful or not, should speak for themselves and need no further explanation. This change in approach being considered, I am dropping the use of a questionnaire as unnecessary. It might also be noted that due to the fact that the film is to be shown as a 2 screen presentation and 2 films are necessary, the film will be 3 to 4 minutes in length rather than 6 to 10 as originally stated.

June 3, 1968
The nature of animation

A Animation as an art form

Should we consider animation an art form? We see a Tom and Jerry cartoon where the cat is blown up, beaten and skinned alive in the course of 30 seconds. This is the animation we are familiar with and it is little wonder that we do not consider it fine art. Animation produces effects that are inconceivable in real life and at best, difficult and heavy handed in live action film. It has, for this reason, become the medium of comedy, violence and magic.

An animated film is one that is produced frame by frame and is, for this reason, a slow and tedious process. Because of this the film maker has neglected animation in favor of live action and its unlimited possibilities. We can not condemn the film maker for neglecting this particular aspect of his art. After all, film making developed somewhere between photography and the theatre and animation is not really a part of either. Animation falls more within the realm of the artist. It is hand made. Film has only provided the animator with means of recording and presenting his art.1

If animation falls short of being a fine art, it is the fault of the artist. The reason most artists avoid the medium is because it is technical and expensive. For a variety of reasons, this is not justified. Animation offers opportunity that is limited only by the imagination

of the artist. No other medium can offer the artist such complete control of what Kepes calls the "optical environment". 2

Animation offers the artist an existing audience through television and the cinema, an audience that is hungry for new and more exciting visual material. We have undergone a revolution in this respect. 3 We are faced with a whole generation that has grown up with television and is more aware of what it sees than any other generation before it. The artist can no longer lament over the apathy of his public if he does not grasp the wider variety of media now available to him.

Animation, as one of these mediums, offers the artist a great deal. A film can be produced by one man. It can be as abstract or controlled as he wishes. It can express his style more completely than any other medium through the development and evolution of an idea. In no other way could a painting be put into motion.

"Animation has been, from the very beginning of film history, a vital field for experimenting with new techniques and ideas, as it is the film activity best suited for conveying pure design directly onto moving film. Many other film media have drawn inspiration from experiments made in entertainment and avant-garde cartoon productions." 4

Form and content are closer in animation than in any other art form. 5 Ideas are not re-

2. Kepes, G., Language Of Vision, p. 18
3. Herdeg, W., Film and TV Graphics, p. 8
4. Ibid. (3), p. 21
presented, they are developed. Action is the dominating factor. In a painting we are presenting one idea, but in animation we can illustrate our thinking process. Our purpose is not to entertain, but to take the viewer and allow him to participate in the thinking process.

Animation can be communication on a level never touched. It begins where reality leaves off. It can be as literal or as abstract as we wish, animation materializes the impossible, invisible, ludicrous, fantastic and grotesque.

"As an artist he is moving toward the opposite high tension object, which is the way all things look from his cool, almost hallucinatory realm of vision, away from the definite statement, which becomes abstract merely by taking a position."

In my opinion animation is an art form, one that is within the reach of the individual artist, one that has unlimited potential that has hardly been explored.

6. Spottiswoode, R., *Film and Its Techniques*, p. 142
7. Ibid. (6), p. 23
B The origins of animation

Before going further it would be best to explain what animation is, by explaining how it developed. In 1829 Joseph Plateau published his investigations into the "persistence of vision". He found that when 16 pictures, making a movement, are shown to the eye in one second, the eye will fill in what is lacking and see the movement as complete. This was called the "stroboscopic effect".

Plateau constructed a device he called the phenakistiscope which demonstrated the stroboscopic effect. A series of drawings were placed on a wheel and a slot was provided for each drawing. When the wheel was turned and the drawing, reflecting in a mirror, was viewed through the slots, the illusion of movement resulted. This was the earliest and simplest of the devices through which animation developed. It should be noted that it developed apart from and in no relation to photography. The animation that is produced today is not much different except that the drawings are recorded on film.

The development of animation continued on its own with each inventor seeking a better method of presenting his work. In 1877 Emile Reynaud developed the praxinoscope. In this device the drawings were viewed directly in a mirror without passing through slots. This resulted in a brighter image. Reynaud later developed a device

9. Ceram, C. W., Archaeology of the Cinema, p. 18
10. Ibid. (9), p. 18
that, although primitive, forshadowed, not only modern animation, but the cinema as well. He painted images on celluloid strips and, using a projection lamp and mirror, reflected the image onto a rear projection screen. He turned a crank, moving the image in front of the lamp. Some of his presentations were 15 minutes long and contained 700 frames. Reynaud showed his moving pictures in Paris from 1892 to 1900. In 1895 the Lumieres made their presentation of the first motion picture photography and animation was relegated to develop as a branch of motion picture photography.

The first animated cartoon, Gertie, the Dinosaur, appeared in 1909, drawn by Winsor McCay. He was followed by Max Fleisher who introduced Koko, the Clown who appeared out of an inkwell, Felix, the Cat, and Betty Boop. Fleisher is notable in the development of animation. His characters explored the visual possibilities of the media in a simple and unsophisticated manner. The visual puns and fantastic tricks he used were fresh ideas in their day. The sheer comedy when Felix uses a question mark as a hook is rarely matched in modern cartoons. A French cartoonist, Emile Cohl, with his simple and personal style, established for animation a reputation as a media that would allow an artist an individual means of expression. These early cartoonists with their simple innocence showed what the individual talent of an artist could accomplish without automation or production line techniques.

11. Ibid. (9), p. 194
12. Ibid. (1), p. 7
13. Ibid. (1), p. 30
14. Ibid. (1), p. 32
15. Ibid. (1), p. 34
In 1927 Walt Disney introduced Mickey Mouse. Little can be said about Disney that is not well known. He brought animation into popularity as more than a short feature. His influence is perhaps the greatest but it cannot always be considered good. Aside from Fantasia he did little to develop the medium as an art. Disney created animal characters that were little more than human reflections. His influence was so great that some believe that it has retarded the growth of animation. The production line techniques he developed and the rigid standards he set left little room for individual creativity.16

Other American animators, although of less influence, should be noted. Tex Avery is known as the originator of the school of violence. He worked on cartoon characters such as Bugs Bunny and Tom and Jerry.17 The U.P.A. group in the early 1950's developed new styles based on simpler, less lifelike design and allowed individual artists much freedom in the development of personal styles.18 Notable among the group is John Hubley who worked with Disney but later, on his own, produced such remarkable films as Adventures of an Asterisk, Moonbird, and The Hat.19 Of recent fame are Hanna and Barbera who have developed a mechanized system of production. Positions of characters are classified and numbered. The script is fed into a computer and the machine does the work.20

16. Ibid. (1), p. 39
17. Ibid. (1), p. 58
18. Ibid. (1), p. 46
19. Ibid. (1), p. 57
20. Ibid. (1), p. 59
Looking at the history of animation, it is difficult to find an artist who has approached the medium as anything more than entertainment. One artist does stand out in exploring and developing the media as an art form. Norman McLaren of the Canadian National Film Board has approached animation with unequaled and unlimited imagination. He states, "I hope I am bridging the gap between painting proper and the animated film."21 McLaren works independent of the graphic arts; his material offers him inspiration. He approaches film with an artist's instinct and brings scientific knowledge to his techniques.22

McLaren has developed several techniques.
1. Hand painted film; in this case the drawing is done directly on the film and often includes a hand painted sound track. Examples are Begone Dull Care and Horizontal Lines.
2. Pixillation; this technique involves the single framing of live actors to produce wild and unbelievable action. Examples are Neighbors and Chairy Tales.
3. In another technique, pastel drawings are worked over and over and photographed in the process. An example would be C'est L'Aviron.
4. McLaren has also done films animating objects such as in Le Merle.23

Each of his experiments brings innovation to animation. Norman McLaren is an artist who offers an inspiring example for the artist who wishes to explore animation.

22. Ibid. (3), p. 17
23. Ibid. (1), p. 70-72
As I have mentioned before the relationship between film and animation is more historical than structural. However, since both are motion pictures, it is best to consider what there is in the nature of film that applies to and can be used in animation.

Film is put together; it is a montage. Animation is planned and in most cases should need little editing. However, it is an advantage for the animator to be able to continue his selective process through editing, to remove or rearrange. Montage applies in another respect; film can be a montage of ideas or visual conflicts. The very fact that conflicting elements are closely juxtaposed results in an order.24 Animation follows the same rule and the artist would be wise to consider the effectiveness of using his material in this way.

Film is experience; it has little to do with literature.25 Both live action film and animation are visual experiences. The viewer sees and is involved. There is a dream-like feeling as we watch the screen; the room is dark and our attention is directed to a rapid succession of visual material. Painting or literature cannot do this. You can make a film about a book but cannot put into words the individual experience in the cinema. Too often films are just recordings of events. This is not the nature of either animation or film. Film should be mechanized.

24. Eisenstein, S., Film Form, p. 54
25. MacCann, R., Film; a Montage of Theories, p. 18
imagination, either subjective or objective but always more than a recording or entertainment. Design is always a part of a good film. Animation is based on design but in live action it is also one of the most important considerations. The films of Eisenstein, Fellini, Antonioni and Bergman depend heavily on the arrangement of the elements within the frame. The artist doing animation can learn from film makers like these when considering putting his designs into motion.

D Advantages and potential

Animation is almost always interesting; visual material that moves draws our attention. We are also likely to retain the unusual images produced in animation longer.

As in other media the artist uses, material costs can be cheap. In animation film costs are much lower than in live action film. If you are buying or selling animation expense is based on labor. Commercially produced animation in the United States with sound and in color costs about $14,000 a minute, limited animation, around $10,000 a minute. The bulk of animation produced is for advertising and the clients are willing to pay these prices when realizing the advantages of the media.

26. Ibid. (25), p. 165
27. Ibid. (3), p. 20
28. Lewitan, E., Animation Art In the Commercial Film, p. 10
Animation can be used for many different purposes such as:

1. instructional film
2. cartoons and puppet films
3. satire
4. animation of objects, semi-abstract films
5. abstract patterns

Animation can be one of the most interesting and powerful means of expression at the artist's disposal.

Simple animation can be used in the educational process. Methods similar to the ones I describe can be used in the school room. The methods of production are time consuming but simple and lend themselves well to group efforts. One article I found most interesting describes how kindergarten age children had produced a number of films. A simple stand and an 8mm camera were used and filming was done on high speed black and white film to make bright lights unnecessary. The children painted backgrounds and cut out figures; they worked in pairs moving and framing the figures, acting out their story. Not only did they gain the satisfaction of a creative production but learned to work together.

The future of animation seems much brighter than the past. Computers have been used for a number of years to do the mathematics of animation. Recently, computers have been developed that will also produce the image. The Bell Laboratories have developed a system called BEFLIX, (Bell flicks). This system takes prepunched

30. Ibid. (1), p. 160
31. Harcourt, P. & Theobold, P., Film Making In Schools and Colleges, p. 8-17
cards and records the programming on magnetic tape. It then plays the image on a screen made up of a dot pattern. This foreshadows the day when artists will only have to plan their animation and program the computer which will animate their artwork and ideas.

II Methods

A The animation stand

In order to do animation, it was first necessary to plan and build an animation stand. The commercially built stand is an expensive and complex piece of equipment, but since the principles involved are simple, I do not believe that it is necessary for most productions.

The animation stand mounts the camera vertically over the art work allowing the animator to work freely and register the art work easily. The camera must be mounted securely and in such a way that the changes in elevation can be made in a consistent manner. Some arrangement for lighting is necessary and a shield must be provided so that when acetate or glass is used, reflection will be avoided. The most difficult aspect to be considered is that of movement, for example;

1. vertical movement of the camera in and out on the art work, this can be done by either tracking the camera in and out or by the use of a zoom lens.

   2. movement of the art work, this is not necessary if you use a method of total replacement and exact registration, but this is expensive and time consuming.

Considering the aforementioned, I planned and built an animation stand. The Kodak data book, S-8, Producing Slides and Filmstrips describes the construction of a simple copying stand that mounts a camera vertically over the
art work. With modification I found that this stand would meet most of my requirements.

The stand I constructed consists of;
1. a track made of 2 boards at a 90 degree angle and which carries;
2. a cradle to mount the camera,
3. and a bar to support the lights,
4. The base is made of 3/4" plywood, 24" square, rubber feet were added to prevent it from sliding or rocking.

The camera cradle and light bar are mounted with bolts and wing nuts to allow adjustment of the elevation. The track is also mounted to the base in the same manner to allow disassembly for moving. Turn buckles were added for extra support and a cardboard shield was placed on the light bar between the camera and the art work.

On the base is mounted a moveable working field constructed of;
5. a piece of masonite sliding in aluminum channels, allowing horizontal movement to the right and left. On this is mounted a second
6. pair of channels that holds the art work and allows it to slide vertically up and down. Tape measures are also mounted on the base, numbering out from the center and allowing registration of position, for example, North 8½" and West 4½". Diagonal movement is also possible by moving horizontally and vertically at once. This field allows movement of the artwork rather than the camera, this is technically easier and time saving when producing the desired movement.
B The camera

The next consideration was that of the camera to be used. The film would have been best done on 16mm, however, I did not have easy access to a 16mm camera and considering my lack of technical experience, super 8mm was the best choice in terms of simplicity, availability and economy. Several cameras were available with reflex action which allows viewing and alignment of each shot. The cameras also had zoom lenses, this makes vertical movement of the camera unnecessary. Each camera also had the necessary single framing shutter.

After a test film made with one camera proved the shutter to be faulty, I decided on the Kodak Instamatic M6. This camera has the necessary features and single frames with very little pressure on the cable release. A plus-1 close-up lens was added to allow focus closer to the art work and a key was placed in the camera to remove the daylight filter. A test film was made to check exposure, timing, color and alignment and the necessary adjustments were made.

C Planning the film

At first it was my intention to make a film examining various techniques using design in animation. It was, however, pointed out to me that such a film might lack continuity and result in nothing more than a series of visual tricks. From this point I began to develop a
film that would suit my purpose of exploring the medium by controlling the motion and change in design, but one that would consider the necessary elements for continuity.

During my research work I became fascinated with the simplicity and interest to be found in one isolated section of a typographic element or design motif. I took a card and cut a small frame in it and searched for the basic patterns that might suit my purpose. The strength and impact of black and white designs seemed the best solution, not only because of their own inherent strength but because of the nature of the presentation. When a film is presented we darken the area as much as possible. The lit, white screen is surrounded by black. If the moving shapes on the screen are, themselves, black and white, the effect can be that of changing the size and shape of the screen. The desired effect should result, not in the obvious motion of the design on the screen, but in directing the motion of the eye around the screen and the seeming motion of the screen. Color might also be used for additional impact and interest.

The use of multiple screen projections has the effect of moving our center of attention. If this were combined with the use of moving design the result might be an interesting study in the use of animation. The film I decided to produce would be a two screen presentation of black and white design in motion, with the later addition of color.
BASIC ARTWORK
Music

The next step was to find suitable music to use in the presentation. The importance of the sound track in what would seem an entirely visual experiment cannot be underestimated. In live action the speed of change is determined by nature. In an animated film that has no relation to nature, what should be the speed of motion and change? What might be too fast for one member of the audience might be too slow for another. It is my opinion that music is far better developed as an abstract form than the visual arts. Why then shouldn't music offer a guide for movement? A symphony might prove interesting but it is beyond my limited understanding to break down such a sophisticated piece of music. It would also require precise sound synchronization which is not possible with simple equipment.

The clear, simple rhythm of jazz offered the best answer to my needs. By recording and slowing down the music, the timing of the beat is determined. This is translated into frames (at 18 frames per second). When sound and film are played together, the ear hears the beat and the eye follows it. When the sound track is not married to the film, the synchronism is by no means exact but the desired result of providing the image with the speed and rhythm for motion is obtained.
E Method of production

A piece of music, (Opus De Funk, Modern Jazz Quartet), was chosen. It was broken down into basic movements and beats. The timing of the beat was at the rate of 3.5 per second. At the rate of 18 frames per second this breaks down to approximately one beat every 5 frames. Every basic change in the film takes place at this speed, 3.5 changes per second. Some attempt is made to make other visual changes with changes in the melody but synchronism is not to be depended upon.

Several pieces of art work were developed to contain as many possible variations found in the combination of horizontal and vertical bars. Each piece was placed in the moving track and the camera focused on an approximate area of 3x4" of the art work. The selection of the 3x4" area results in a definite proportion ratio. The horizontal and vertical bars of the art work are 1 1/2" in width. The viewed area is therefore 2 bars high and 3 wide. In this way the patterns are meant to fill the screen.

Each piece of art work is moved under the camera and the movements are single framed. The movements may flash, flow, jerk or jump, but always at the rate of 5 frames per move. Color later replaces certain areas and is also filmed.

In the production, two screens are used. The first section, where synchronism will be best, uses both screens in unison but as the
film proceeds, action will be shifted from screen to screen as a device to enhance the development of rhythm and pattern. The title appears last and moves from one screen to another, changing size in the process. During presentation, the two screens are spaced the distance of one projected bar apart to complete the planned proportional development.
III Conclusion

A Analysis of results

Animation seems in some ways hard to justify. Having finished my film I find that I have 3 3/4 minutes of screen time. It is easy to pass it off as only a momentary visual experience compared to longer and more dramatic productions. It is easy to miss the point that it is a carefully planned visual experience, involving moving patterns.

Each second of film involves several minutes of production time, and the results are crude at best. Why then did I decide to explore this medium? My purpose was twofold. First, I wished to explore the methods and means of production. I devised a simple and workable system but would note two problems. Registration of the art work turned out to be one of the most difficult problems to solve. The patterns do not always fill the screen. It would have been better to produce a film that was not so dependent upon this factor. Secondly, film size becomes a problem, editing and sound track being difficult with 8mm film. I would suggest that anyone would be better off working on 16mm.

My second purpose was to produce a film that would create the illusion of movement. This illusion is not as evident as I hoped and it seems more often that the art work is in motion. The selection of jazz as the best music for a pro-
duction such as this turned out to be a wise decision. The simple beat in many cases carries and coordinates the images.

I hope that I have demonstrated that animation is a media that should be explored further, that it can be an art form with techniques within the reach of the artist. The time spent in production compared to presentation time seems disproportionate but the results can be powerful.
B Illustrations

1. Animation stand complete

2. Moving field with art work

3. Camera

4. Animation stand in use

5. Sections of the film
C Bibliography


Eisenstein, S., *Film Form and Film Sense*, Meridian Books, New York, 1957


Hubbell, G. S., *Writing Term Papers and Reports*, Barnes & Noble, New York, 1958


MacCann, R. D., *Film; a Montage Of Theories*, E. P. Dutton & Co., New York, 1966


Spottiswoode, R., *Film and Its Techniques*, University of California Press, Berkely and Los Angeles, 1957


MacCann, R. D., *Film; a Montage Of Theories*, E. P. Dutton & Co., New York, 1966


Spottiswoode, R., *Film and Its Techniques*, University of California Press, Berkeley and Los Angeles, 1957