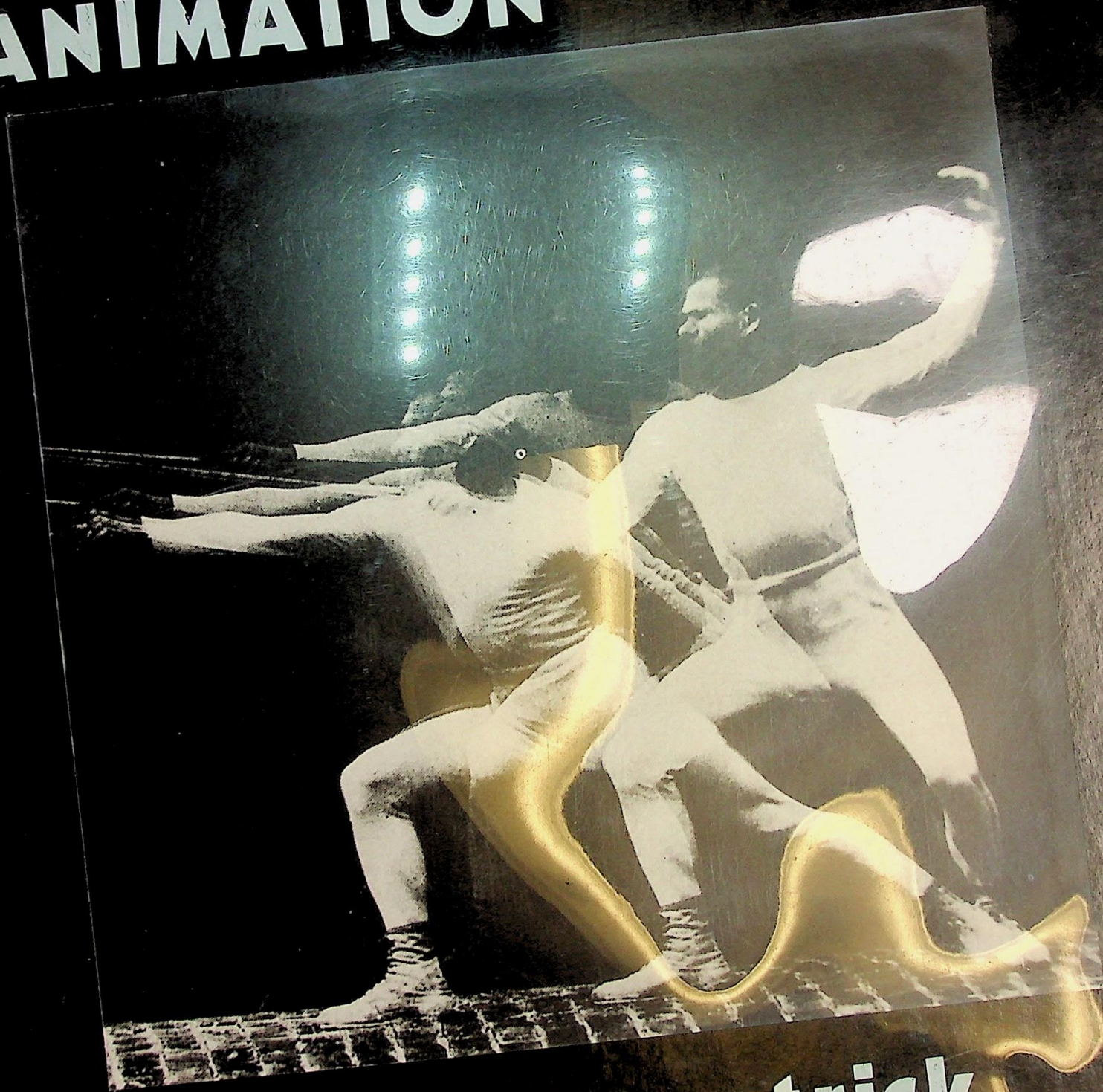


# REPRESENTATION OF MOVEMENT THROUGH ANIMATION



Cormac Fitpatrick



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## INTRODUCTION.

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The aim of this thesis is to explore the possibilities of representation of movement through animation techniques and its application to Art Teaching. The benefits of using animation technique as a means of developing visual awareness and imagination I believe are immense. Art and Animation are closely related and animation can be used to develop artistic skills and broaden the scope of visual understanding. Animation offers a new dimension to Art in that the representation of movement is introduced to the fields of painting, design and sculpture. I hope to show how this can be achieved within the Syllabus of Art Education.

The disciplines involved in animation work are similar to those required in artistic creation of any kind, however, the skills involved in animating are a fusion of the disciplines of design, painting, craftwork, writing and photography. Animation work is an extension of Art with its roots firmly in the Arts but offering more potential to the development of imagination and creativity. The educational value of animation is the scope of materials, skills and creative processes it involves and the understanding of movement and visual awareness it engenders.



## CHAPTER 1.

### ANIMATION AS A MEANS OF UNDERSTANDING THE MEDIA.

Modern man is to a large extent a product of his environment, the culture which surrounds him and influences his life moves at an even quickening pace and becomes more complex. In this turbulent environment making sense of things becomes more difficult. Never in the history of mankind has visual material and stimuli been so prevalent or played such a major role in cultural development. The media has an enormous influence on the cultural and visual developmental aspects of society and this influence is exerted through television, films, photography newspapers, magazines, radio etc. Communications and visual communications in particular have reached an advanced stage of development in a very short space of time. These technological miracles have lead to the invention of the computer-chip or silicon-chip which while still in an early stage of development has already brought about rapid and revolutionary changes in the means of production far greater than those brought about by the Industrial Revolution. The indications are that this process will continue and escalate to proportions whereby factories and offices will be operated by computers. Already some car manufacturers have introduced robot assembly lines, while the word processor is taking over the work of many secretaries leading to massive unemployment figures throughout the western world. The full impact of this computer chip revolution has not as yet been felt but many theorists predict that people will eventually be replaced by machines.

The result of this revolution will be that people will have more and more leisure time and will be subjected to more visual stimuli and material through television etc., than ever before. The advent of the cinema in the 1900's saw a rapid decline in the numbers of theatre-goers, many theatres having to close.



In America, Vaudville was abandoned overnight in favour of Cinema. The introduction of television had a similar effect on the Cinema Theatres of the Fifties. However, television unlike Cinema is available in the home and is a form of visual stimuli which is on continuous supply. Practically every home now has a television set and its influence for better or worse is enormous. The dissemination of information and visual bombardment by television leaves little room for objectivity, the programmes on television are selected for the audience just as the films are selected by critics, censors, producers etc. The audience have little say in what they are being shown either for entertainment or educational purposes. It is therefore essential that individuals are given an understanding of cinematic language in order to gain a greater objectivity and visual awareness of the material which is presented to them through the medium of television and cinema.

#### ADVANTAGES OF ANIMATION.

In order to understand cinematic language it is necessary to study cinematic techniques and visual grammar of cinema through practical exploration and application. Cinema is primarily concerned with movement, light and storytelling, these basic elements are the genesis of all cinema and they are elements which cannot be learned other than through practical experimentation. To try and describe or explain the processes involved in cinematic technique in purely verbal terms would be like describing the Mona Liza to someone who has never seen it.

Animation offers the best method of learning cinematic technique and language in a practical way in Art Teaching. It encompasses the basic elements of cinema i.e. movement, light and storytelling, and incorporates the techniques of animation which involve elements of design, painting and craft. It also allows scope for the imagination and inventiveness of the animator. The range of media which can be used in animation and the mixture of media make it an extremely interesting field of endeavour. Virtually anything can be



animated, so the scope of the animator is bound only by his imagination. Each technique of the animation requires a different skill in handling the materials being used. Cut-out paper or photographs from magazines, plasticine, wooden puppets, wire-puppets, drawings, letters, designs, household objects etc., can all be animated and used to tell a story.

#### THE ROLE OF A STORY ELEMENT IN ANIMATION.

The story element of animation is an important part of the understanding of cinematic language and application of animation techniques. In order to illustrate a story using purely visual techniques it is essential that the story follows a logical path, in the tradition of storytelling, relying on the movement and imagery to get the story across. Deviation from the story leads to confusion and destroys visual comprehension. A well structured story is necessary to achieve a cohesive animation which flows logically in purely visual terms. Involved and complicated concepts cannot be translated into animated form without the use of dialogue. Thus, purely visual stories must be of a simplistic nature in order to be comprehensible in animated form. A comparison can be drawn between silent animation and films of the Silent Era which rarely dealt with subjects more complex than good guys and bad guys, while silent comedies relied on slapstick for comic effect. Subjects of deeper content like 'The Battleship Potemkin' (Eisenstein), 'The Crowd' (King Vidor), 'Metropolis' (Fritz Lang), required titles and music in order to explain the story.

There is a strong relationship between the stories of the silent cinema and those which are prevalent in many animations. Cohesion between the story and visual simplicity are common to both, also, elements of slapstick occur in silent cinema and animation. The addition of sound and dialogue to animation can facilitate a more complex story-line but visual cohesion is still essential.



Animation is primarily concerned with movement and the logic of that movement determines the visual cohesion of an animation. Animation is the Art of making things appear to move when in fact they do not, the ability to control objects and drawings, envisage how movement can be achieved and thereby create movement is the fundamental technique of animation.

The skills required in animation work are not simply to create movement but also involve crafts such as puppetry, sculpture, modelling in wood, plasticine and wire etc., using papier-mache and drawing or designing skills depending on the technique of animation which is employed.

The development of imagination is another aspect to animation. Anything is possible in the field of animation, so the scope for imaginative development is immense. The variety of materials and crafts involved in animation work each requiring different skills in handling and construction, the visual perception required and controls of movement which must be learned as well as the outlet it offers for expression and creativity makes animation a unique and very appropriate area of endeavour for both artists and students.

#### ADDITIONAL ASPECTS OF ANIMATION.

Yet another aspect to animation is the understanding of the capabilities and limitations of photographic equipment which is learned in the process of animation. A knowledge of how cameras work and the photographic techniques which can be employed is essential before considering animation as a means of expression. As well as offering skills and techniques which are part of the process of photography, animation develops an awareness of cinematic language, thereby, enabling the student to become objective and critical of the visual material which is presented by the media.

Animation work involving as it does all the elements of Art



and spanning the areas of painting, design, sculpture, craftwork, drawing etc., could quite easily be incorporated into the Syllabus of Art Education in Secondary Schools. The scope of materials and imagination as well as the visual awareness which it encourages makes animation an ideal vehicle for an Art Teacher. It develops co-operation and teamwork when used in the classroom and is an economic method of using film.

I would envisage the practical outcome of this Thesis to develop in two ways:-

1. The making of an animated film using various techniques, illustrating the materials and objects which can be animated.
2. The introduction of movement and animation in the classroom. Beginning a project involving movement and developing the subject towards animation, leading to a project concerned with animation. Finally making an animated film of the students work, using paper-puppets and painted backgrounds. Developing a story bound around the character of the puppet which can then be filmed.

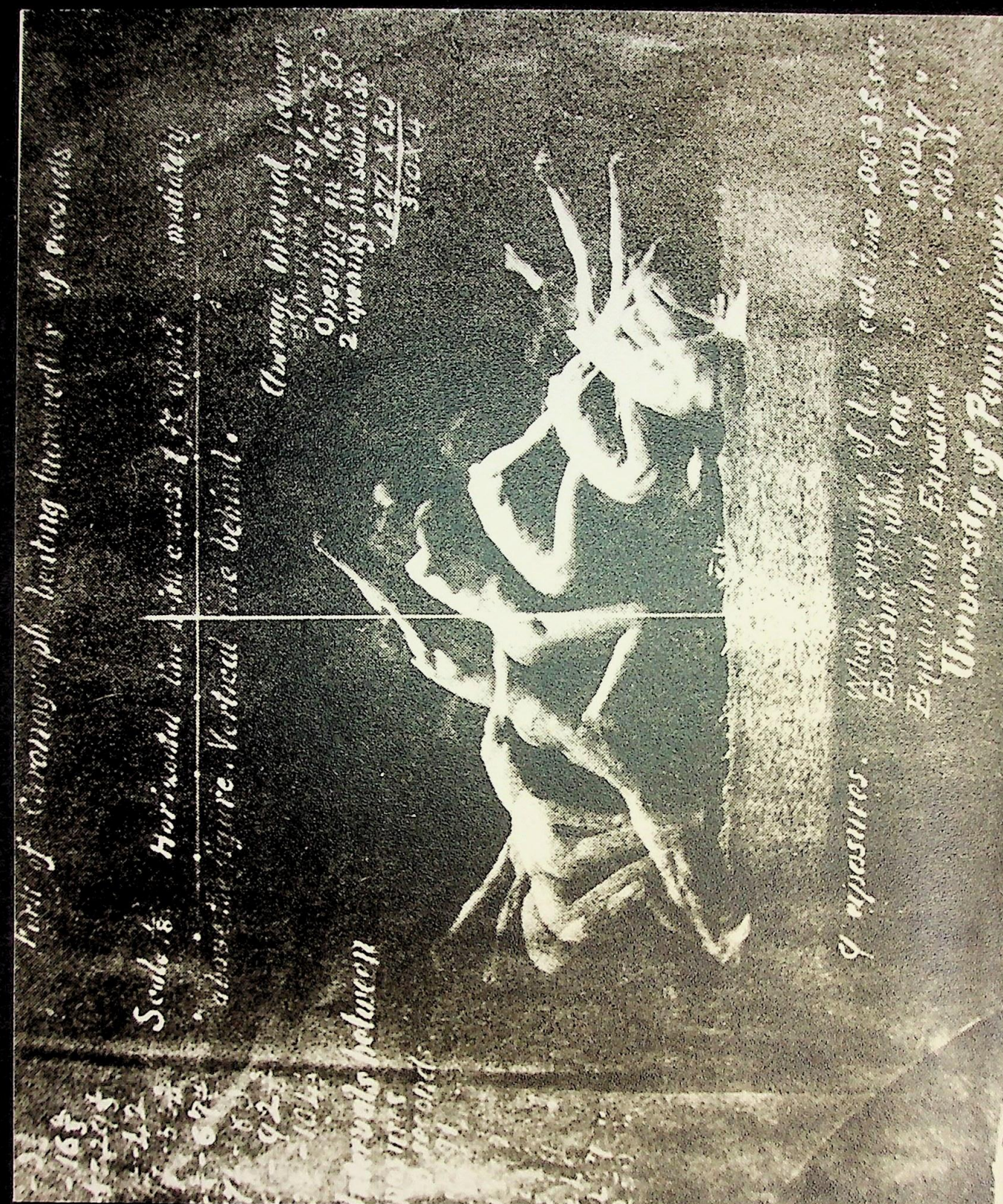
#### OUTLINE OF CHAPTERS TWO AND THREE.

In Chapter Two, I hope to examine the history of representation of movement through animation techniques. Firstly looking at the development of a means whereby movement could be represented truthfully and the effects this had on Art. Secondly, examining the History of Cinema and Animation and the relationship between Art and Cinema. Thirdly, examining the effects of photography on Art and visa versa.



In the Third Chapter, I hope to outline the ways in which animation techniques could be developed and incorporated into the Art Syllabus of Secondary Schools as an extension of Art Education.





Marey; a page from his notebook on motion.



THE REPRESENTATION OF MOVEMENT THROUGH ANIMATION  
TECHNIQUES.

The history of the representation of movement is synonymous with the history of animation and inter-related to the history of the cinema. It was through experiments using animation that the Belgian Scientist, Joseph Antoine Plateu discovered the phenomenon of persistence of vision in 1823. Persistence of vision means that when a number of sequential images are presented to the eye in rapid succession, the optical effect is such that the eye and therefore the brain does not see the intermittent spaces between the sequential images and so only sees the apparent movement of the images themselves. Plateu illustrated this phenomenon by means of a wheel which had eighteen sequential drawings painted on the outer edge of the disc, only one drawing could be viewed at a time through a slit. The disc was spun and when viewed through the slits, the drawings appeared to move. This device with its use of sequential drawings and its reliance on the phenomenon of persistence of vision may be considered the beginning of animation.

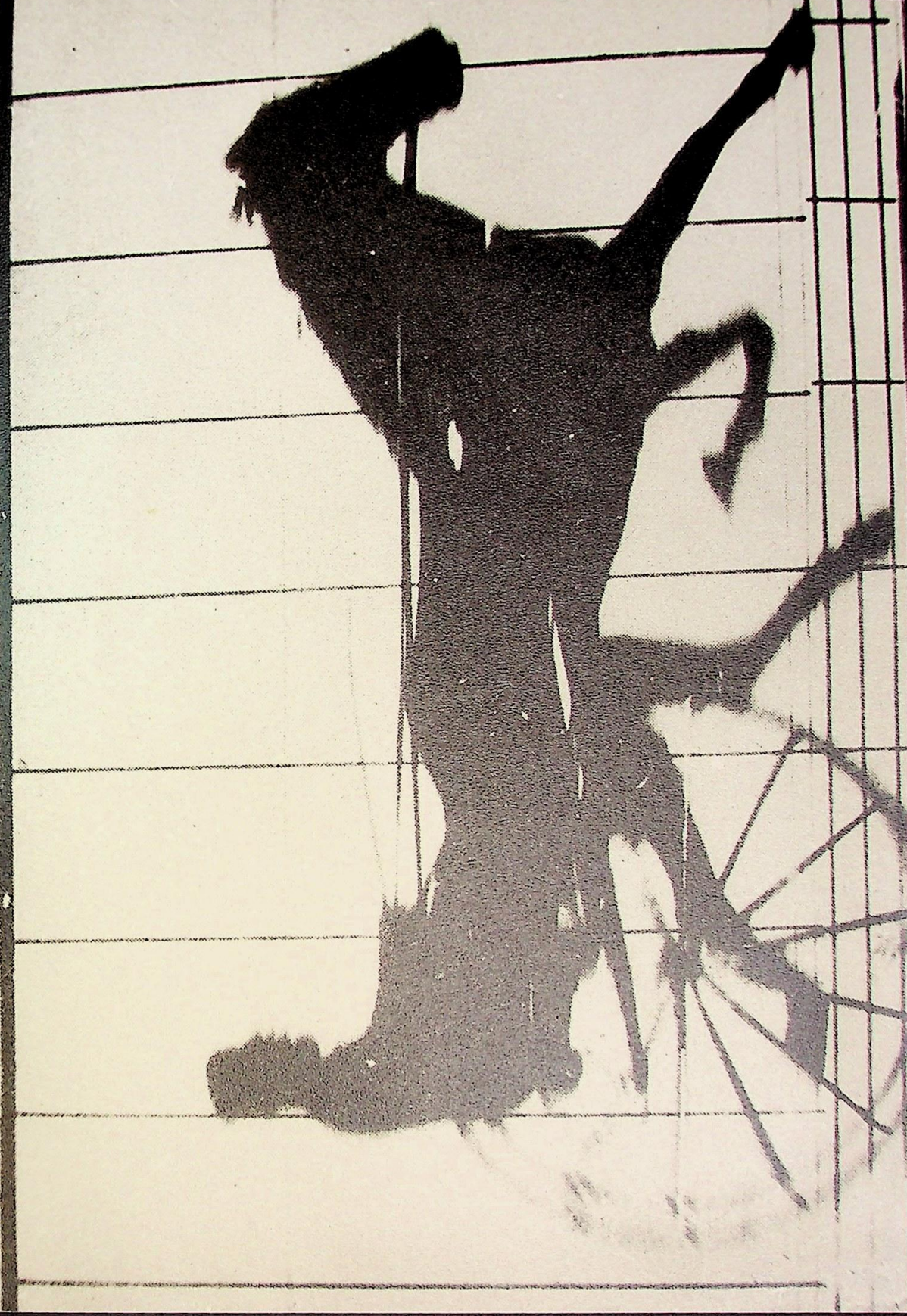
This development created an upsurge of interest among scientists and inventors in the study of optics which became a major field of research. At the centre of this research into optics was the problem, both optical and scientific, of representing images of people and events using photographic means. The problem was solved by Louis Daguerre who in 1839 invented the "Daguerreotype" which was the first camera which could reproduce an image and retain the image. The camera had an enormous effect on the artists of the 19th Century who used it extensively in order to obtain more accuracy and truth in their paintings. The "Daguerreotype" and similar cameras of the time could only photograph "still" images because the shutter speeds were extremely slow and so anything which moved during



Muybridges Zoopraxiscope with Animated disc.



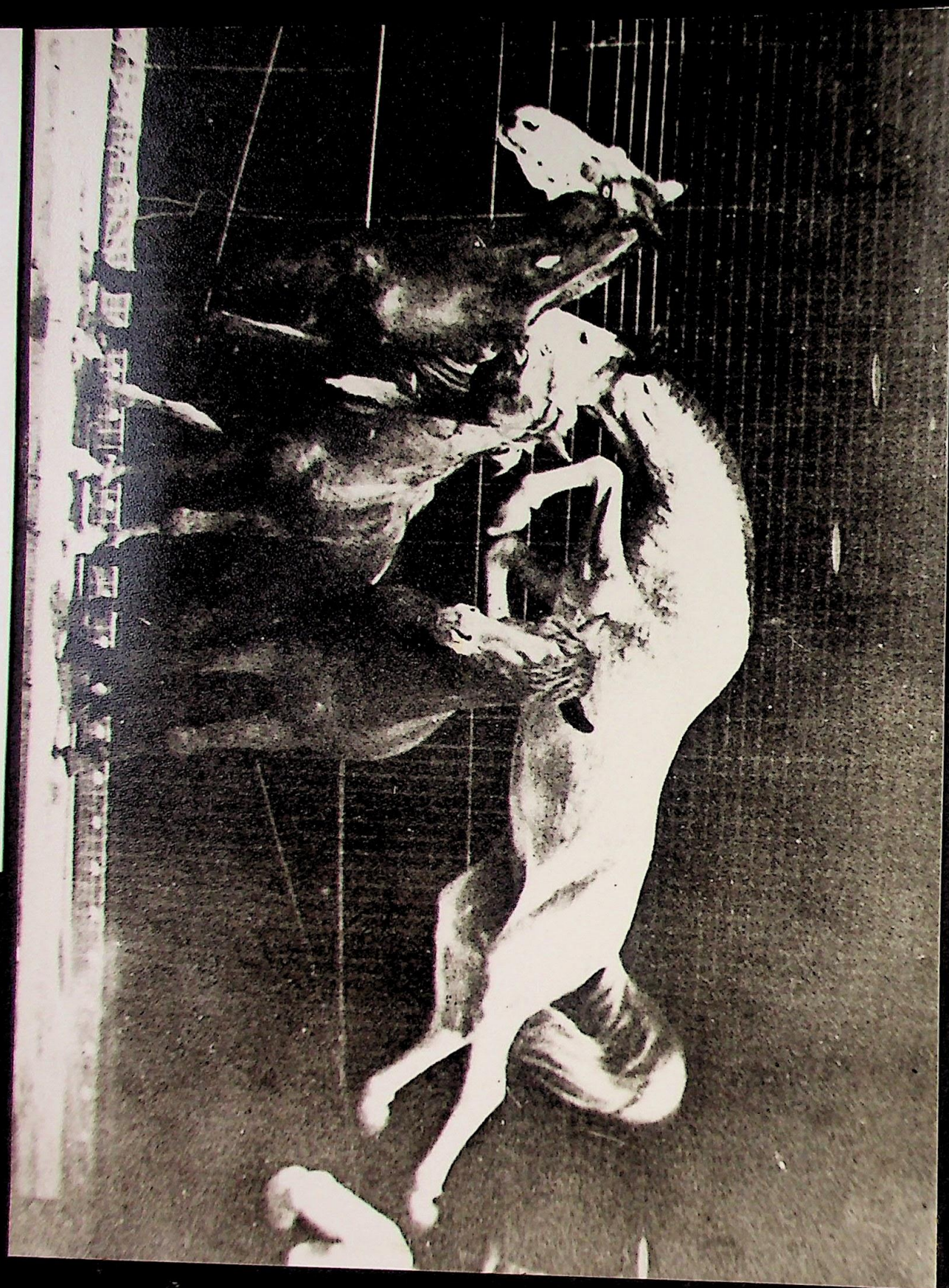
2 3 4 5 6 7 8 9



Edweard Muybridge: Study of Occident trotting 1878.



Muybridge: Study of a horse jumping over three horses. 1878.



the exposure was represented as a blurr on the photographic plate. The problem of how to represent movement accurately using a camera became the subject of experimentation among inventors. In the course of searching for the solution to this problem the inventors began to apply the principle of Persistence of Vision to various photographic techniques. Photographs or drawings of sequential movements were printed inside a cylinder which had slits running vertically down the cylinder at intervals of three inches, when the cylinder was rotated the drawings or photographs appeared to move when viewed through the slits. This device was called the "Daedaleum" invented by William Horner later developed into the Praxinoscope by Emile Reynaud. Another development was the use of glass photographic slides of sequential movements which were mounted on Joseph Antoine Plateau's Persistence of Vision wheel and projected on to a screen using Magic Lantern. Magic Lantern shows became extremely popular with the public and they became the subject of much interest to inventors who could see the possibility of improving on the Magic Lanterns basic principles. The problem of finding a method of harnessing the phenomenon of Persistence of Vision in order to solve the problem of reproducing movement was to a large extent solved by the scientific studies and experiments of Edeard Muybridge.

#### EDEARD MUYBRIDGE.

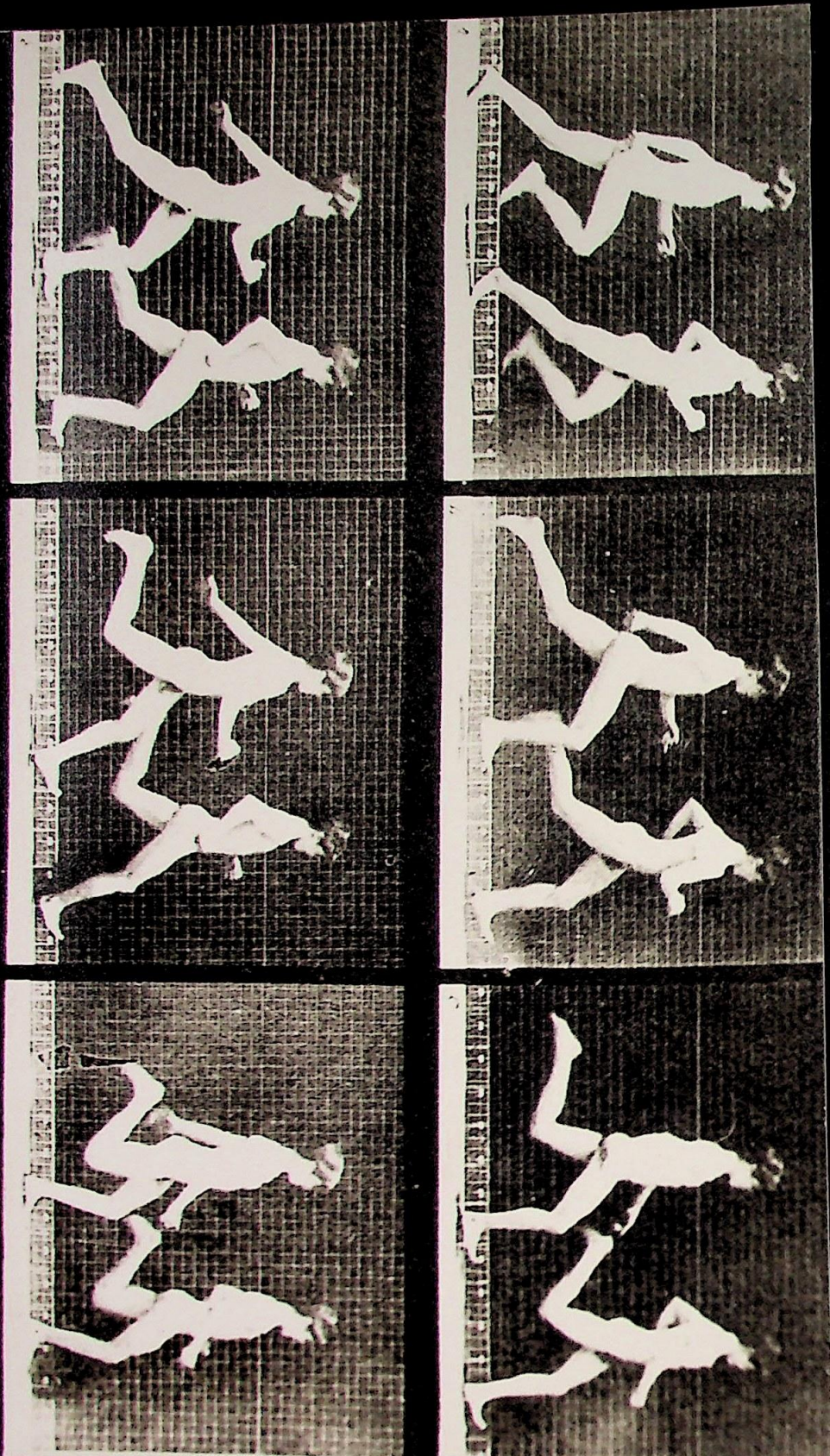
Edeard Muybridge was an American photographer who began to experiment with movement using a camera in order to gain a more scientific understanding of motion. He became obsessed with the idea of recording movement and discovering techniques enabling him to record extremely fast movements in sequence, spending the greater part of his life examining both men and animals in motion. He examined movement in a highly scientific way inventing techniques and developing his own cameras in order to achieve the reproduction of fast moving images without blurring or distortion. These developments were a new dimension to the field of photography, the fast shutter speeds which he obtained lead to the widespread use of cameras, whereas formerly only photographers used cameras in studios





Muybridge; Cockatoo flying. From Animal Locomotion. 1887.

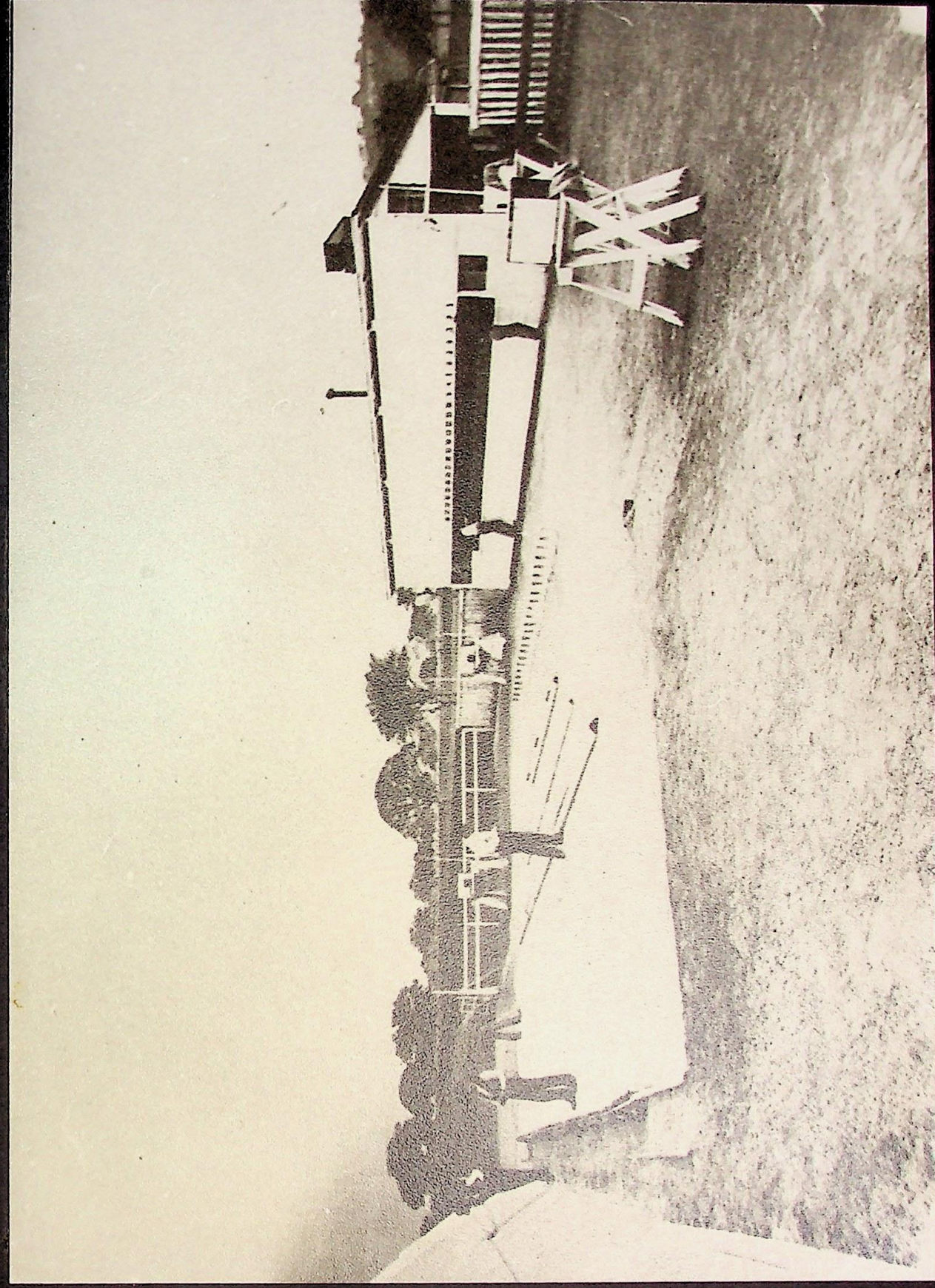




where the subjects had to remain motionless while the exposure was made, now cameras could be used out of doors to reproduce moving images.

Muybridge developed a system of cameras which could not only photograph moving subjects but did so in a sequential order, the result was a sequence of images illustrating the stages of a particular movement. Muybridge used this system of cameras to study the motion of birds in flight, men walking, running etc., and presented his results to the Royal Society and the Royal Academy of Science in 1883. A great debate at the time revolved around the problems of depicting a horse in motion at a gallop. The debate among scientists and artists was finally resolved by Muybridge, who applied himself to the problem and developed a technique whereby the motions of a horse galloping could be reproduced accurately. For hundreds of years artists had depicted a galloping horse with its front legs splayed outward and both hind legs stretched outwards rather like a rocking horse. The studies which Muybridge made were carried out in California in 1874, proved conclusively that the representation of horses at a gallop by artists had been totally inaccurate. Muybridge had solved the problem by using his system of cameras which could record stages of motion but the main difficulty was how to activate the shutters of the cameras at precisely the moment when the horse galloped in front of the lens. Muybridge found that by attaching a trip-wire to the shutter reliance mechanism of each camera and placing the trip-wire across the horse's path, which when broken would activate each camera in sequence as the horse galloped by, that the motion of a galloping horse could be reproduced accurately. The results of these experiments were published in a book called *Animal Locomotion*, and it caused an immediate sensation in the Art World. It was seen for the first time how exactly horses should be depicted by artists when at a gallop. Artists began to realise that the truth of representation was not necessarily what could be seen by the human eye, but that photographic analysis of movement was more accurate than reliance on optical interpretation and representation of movement.





Muybridges installation for photographing horses in motion. 1882.





Artists began to compete with the photographic image and they did so by using the photographic image in order to depict more accurately the representation of movement. Artists like Degas began to use Muybridge's photographs to study movement with the object of depicting movement in a more realistic and truthful way. Painters became more consciously concerned with the representation of movement in their paintings attempting to rival the photographic reproduction of movement. Degas painting "Dancer Tying her Slippers", 1883, is an example typifying the response of artists to Muybridge's work. In the painting a ballet dancer is shown from four different angles in sequential stages of tying her slipper. This relates directly to a series of photographs taken by Muybridge of a girl drying her feet shown from different angles and depicting the sequential pattern of movement involved in the process.

"The vast vocabulary of animation produced by Muybridge, the scrupulous scientific methods employed in its execution surpasses anything of that nature previously attempted in photography. And the great interest and delight with which his photographs were received, the consternation they caused in Europe and America augured significant consequences for Art. Not only did Muybridge's photographs contradict many of the most accurate observations of artists, but, phases of locomotion were revealed which lay beyond the visual threshold the meaning of the term 'true to nature' lost its force. Muybridge's photographs demonstrated that for many artists truth had really been another word for convention". (Aaron Scharf).

Many artists began to use Muybridge's photographs in order to represent movement more accurately,

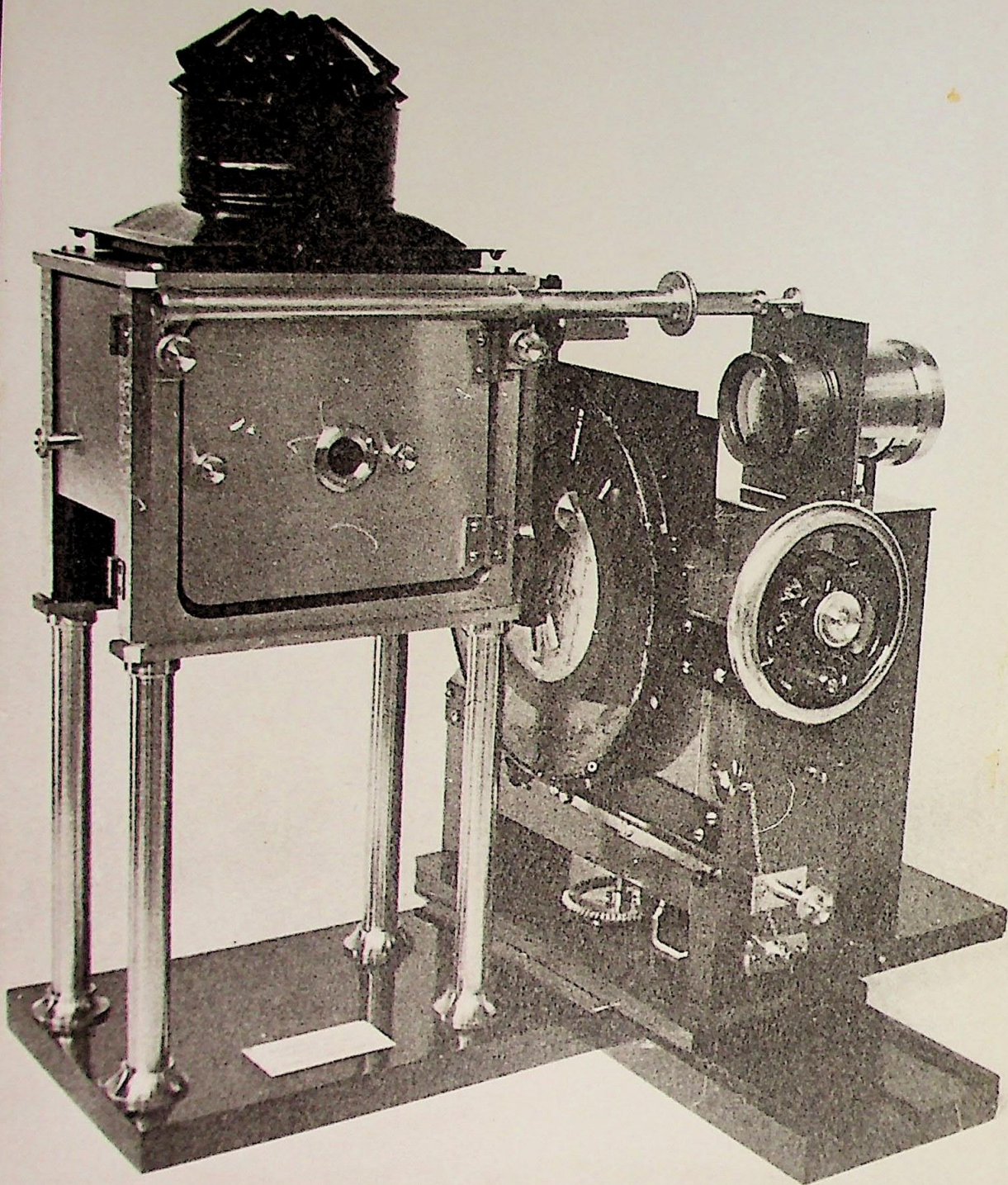
"The chief use of the camera to the artist lies in its power to secure images rapidly of moving animals and for that we owe a debt of gratitude to Muybridge". (John Brett) 1889.





Degas ; Study of a gallop. 1899.





Muybridges Zoopraxiscope .1880.

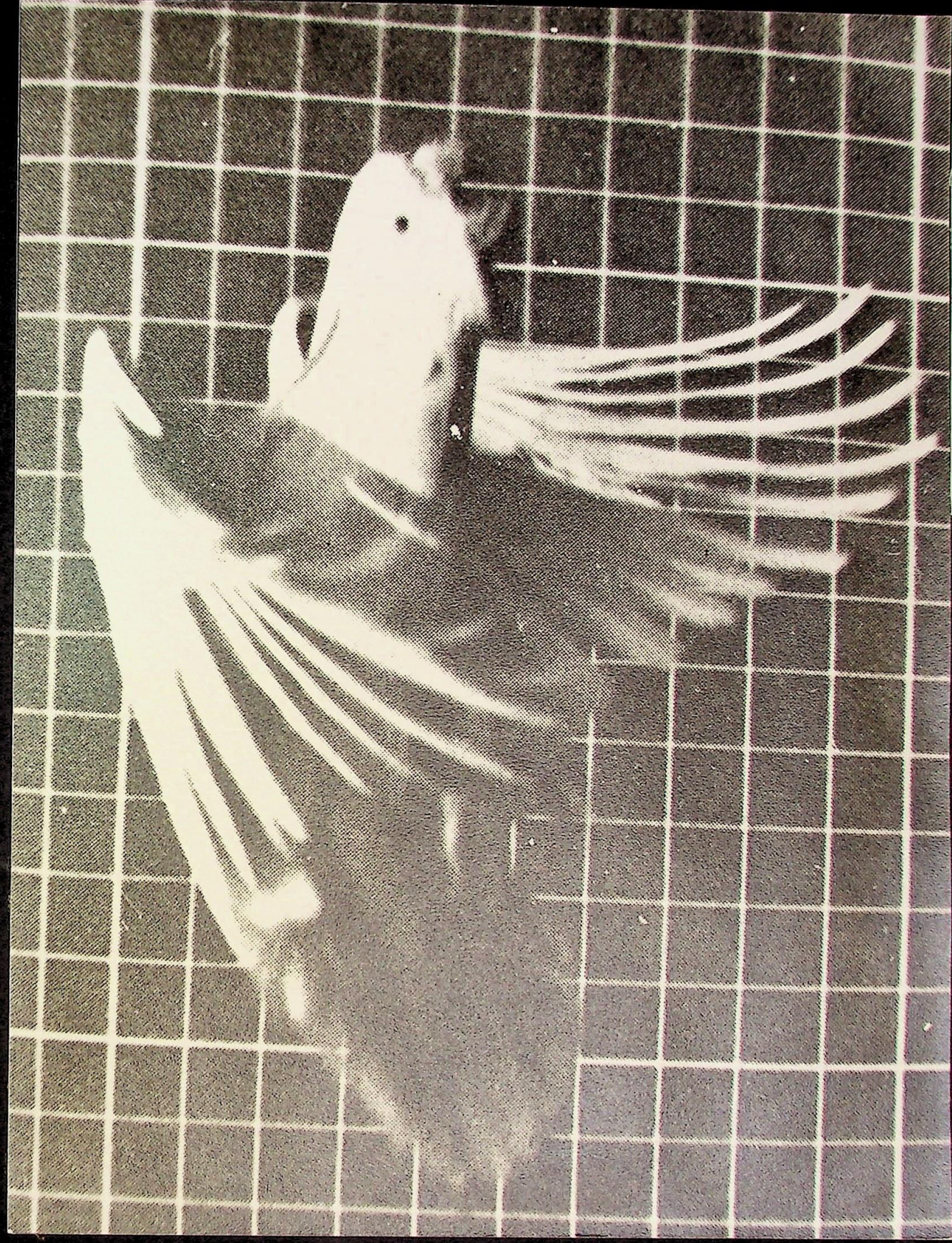
Muybridge continued his studies of movement which resulted in the publication of a book called "The Human Figure in Motion" (1901). This was a comprehensive analysis of every type of human movement. It contained 781 plates with a total of 20,000 figures in all stages of motion, and types of human activity. Included among these were analysis of physically deformed people which Muybridge studied in the hope that the medical profession might gain an insight into methods of curing such deformity. In recent years these studies have been used by Francis Bacon in his paintings.

Muybridge gave many lectures on his analysis of locomotion and it was through the necessity to illustrate his lectures that he invented the Zoopraxiscope later called the photo-praxiscope. This device enabled a series of consecutive photographs to be seen as one continuous movement as they were rotated and projected on to a screen. The Zoopraxiscope while being far more elaborate was based on Plateu's principle of Persistence of Vision and used elements of animation technique in order to represent movement. It is for this reason that Muybridge is known as the "Father of Motion Pictures". Muybridge's contribution to the development of Cinema is immense, not only did he advance the techniques by which movement could be photographed but he invented the means by which movement could be represented in sequential and continuous motion. The interest and awareness of movement which his work created inspired scientists and inventors to find a means by which movement could be recorded, leading to the development of Cinema.

#### MAREY AND THE FUTURIST MOVEMENT.

Marey, a French scientist stimulated by the work of Muybridge and a contemporary of his, became interested in the representation of movement. He began to develop techniques whereby movements of animals and men in locomotion were recorded in oscillations super-imposed on the same photographic plate. Marey did this by exposing the photographic plate in a dark room and as the animal moved across the camera's field of view, he set off a series of flash guns, thus, exposing the image in phases of motion. This created a pattern of movement illustrating the

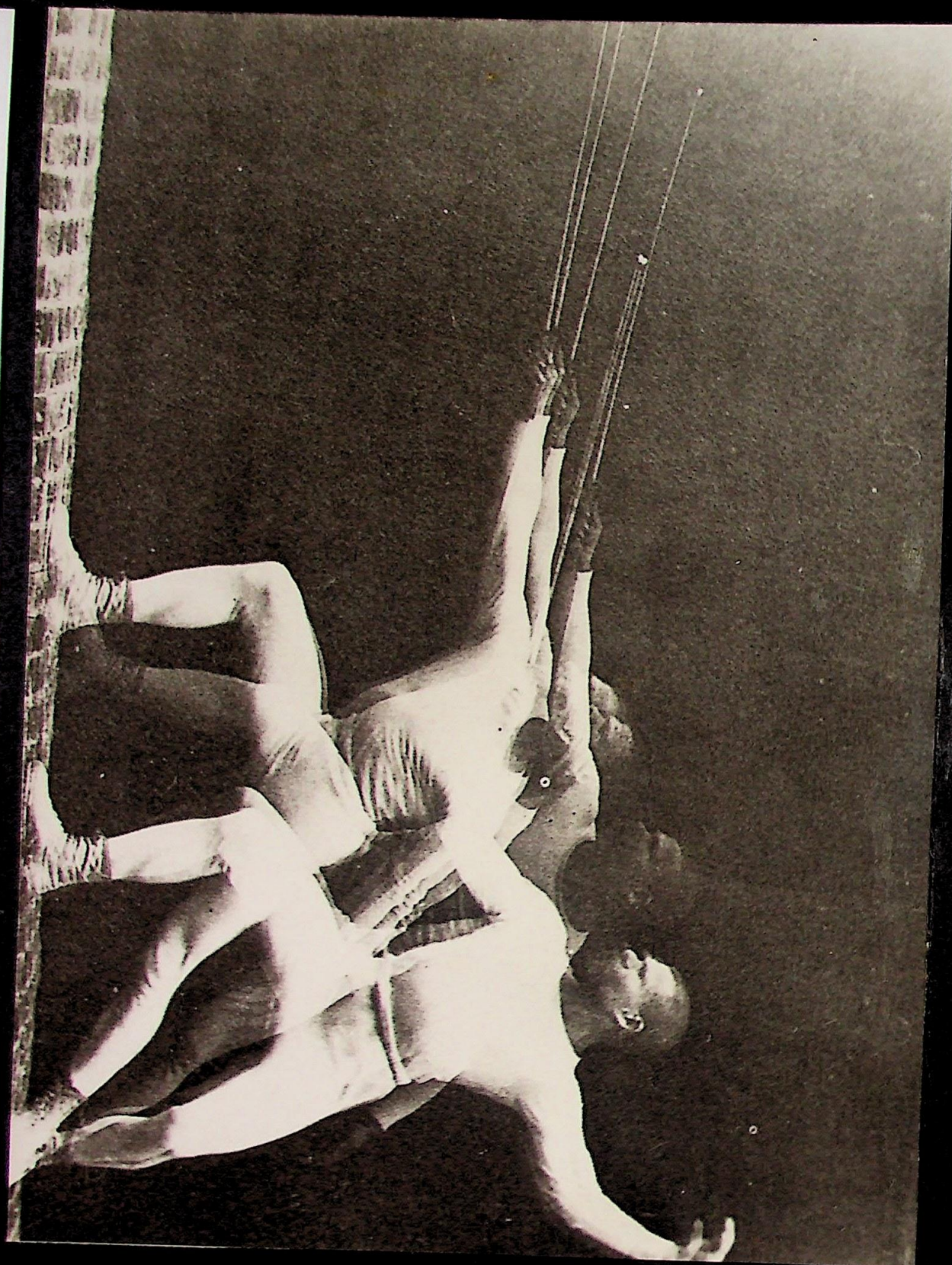




Muybridge; Cockatoo in flight. 1887.



Marey : Chronophotograph of a man fencing. 1880.



trajectory of motion and oscillation path of the animal in multiple exposures. In his book "Locomotions of Man", he published in 1885, Marey presented images of movement recorded using this technique which he called "Chronophotography". Marey was more concerned with illustrating the patterns and phases of movement rather than analysis of separate stages of a motion. Artists became aware of the work of Marey and its potential of creating a new means of expression with less concern for reality and a greater use of abstract imagery concerned with movement.

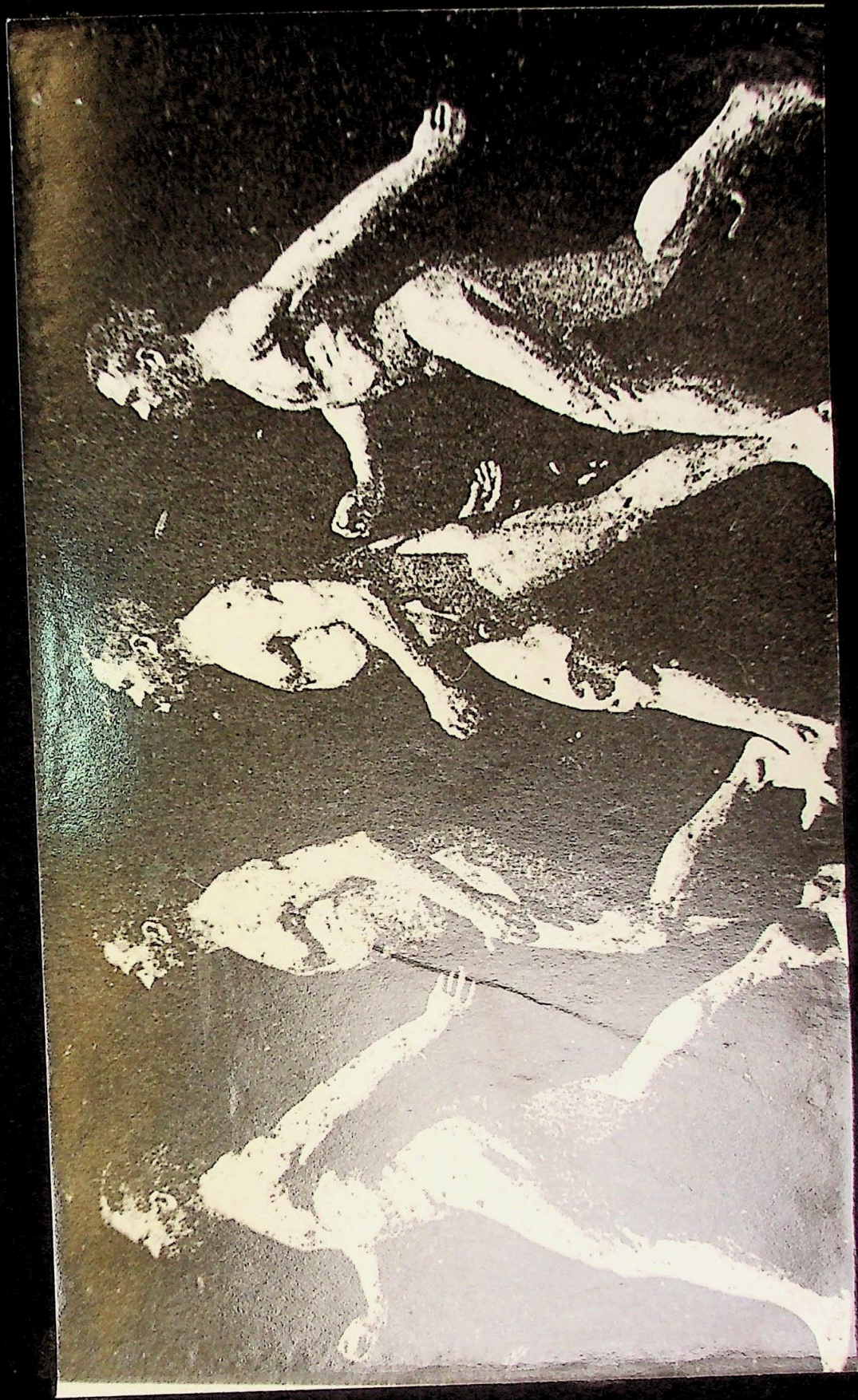
#### THE FUTURISTS REPRESENTATION OF MOVEMENT.

The Futurists movement were a collection of artists who were deeply influenced by the photographic representations of movement which Marey had recorded. The Oscillation patterns and trajectory paths found in Marey's images began to appear in the paintings of Futurist artists. Many of them used Marey's multiple exposure studies in order to gain a greater and more abstract understanding of movement in nature. The Futurists were primarily concerned with the fundamental rhythms and patterns of oscillation caused by movement rather than the objects which were in motion.

Their paintings used the aberrations found in multiple exposure photography to create an impression of time elapsing through the symbolism of multiple images superimposed in patterned continuity, in which the subject is represented in many phases of motion within the same spacial framework in the painting. Using this technique the Futurists had developed a new method of pictorially representing concepts of time and space using movement as the vehicle of expression.

Artists such as Marcel Duchamp, in his painting "Nude Descending a Staircase" illustrates the close relationship between the Futurists and Marey's photographs of oscillations of motion. Marcel Duchamp himself admitted to this connection when in 1912 he stated:





Marey; Chronophotograph of a man walking. 1887.





Duchamp; Nude descending a staircase.

"We were stimulated by the straboscopic and multiple exposure high-speed photographs of Marey".

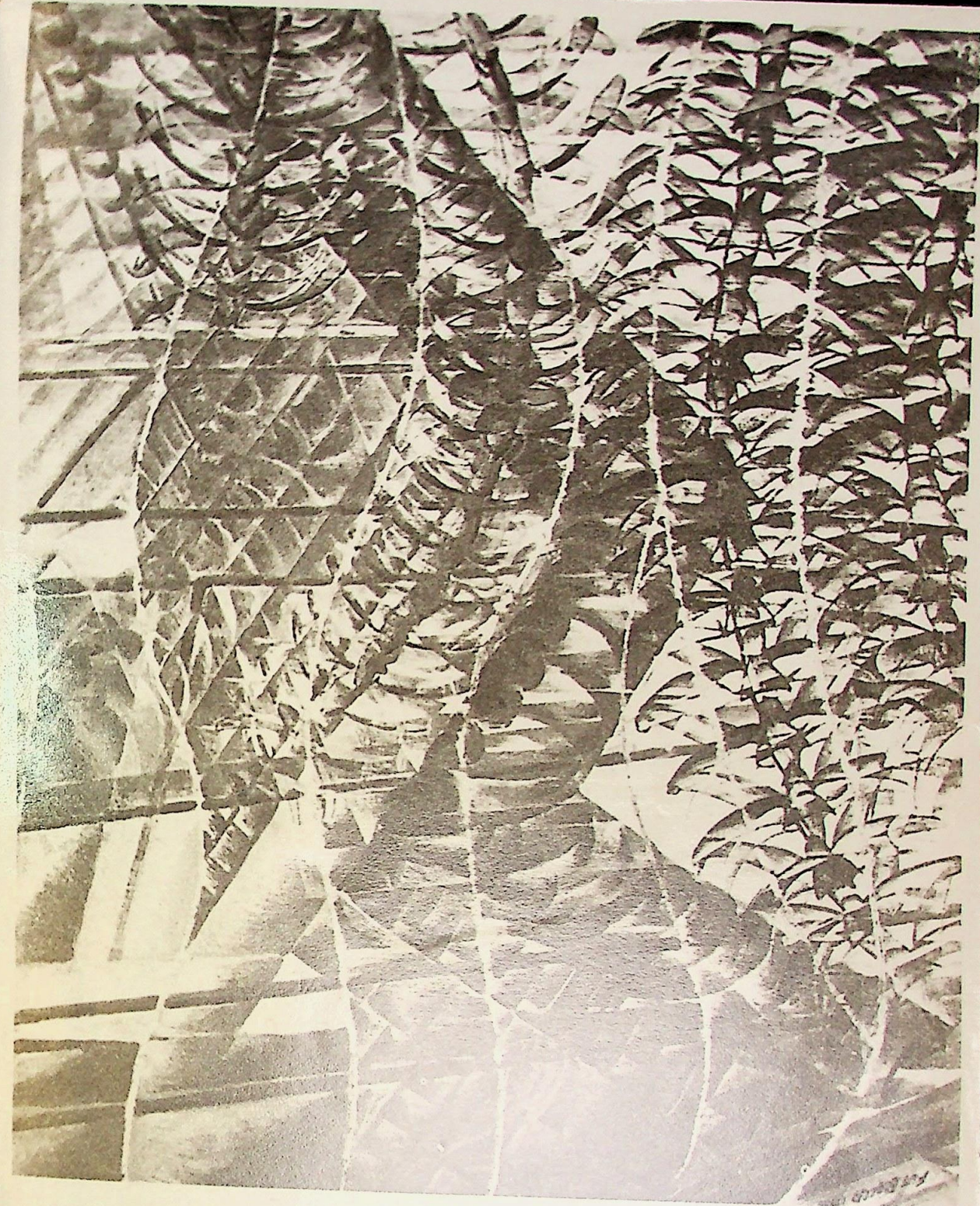
A critic of Futurism of that period wrote:

"Futurism is nothing more than the instantaneous photograph of a sneeze, it is a desperate attempt to introduce the sensation of duration into space and their work reveals the cinematographic tendency of painting".

Marey had some of his chrono-photographs transposed into sculptural form for demonstration purposes in 1887. These were sculptures illustrating the flight patterns and oscillations of birds in motion, and formed a three dimensional model of the movements involved in bird flight. In 1913, Futurist sculptor, Boccioni, produced a series of similar sculptures in bronze which he called "Unique forms of Continuity in Space" which depicted the flight patterns of a bird in flight. Other works of Boccioni illustrate the strong relationship of concept and form, between his sculptures and the photographs of Marey, in which he represents movement by breaking the contours of the figures and creating a dynamic continuity of spacial form.

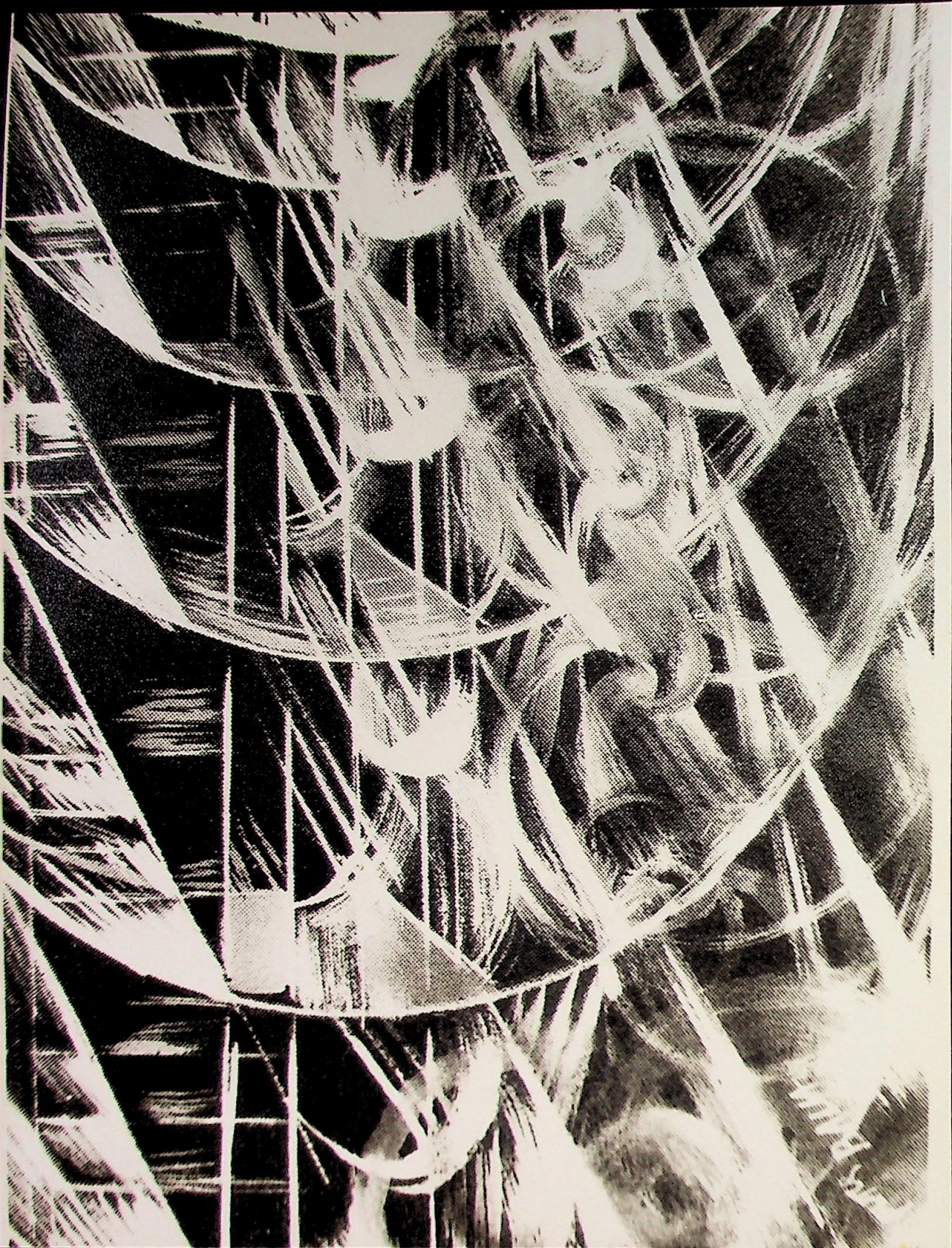
Other Futurist artists used Marey's analitical studies of motion. Balla's "Girl on a Balcony", (1912) indicates the degree to which he was influenced by Marey, his other paintings such as "Dog on a Lease", (1911) and "Paths of Movement and Dynamic Sequences" (1913), use many of the abberations found in Marey's photographs. The superimposition of images, the dynamic use of line to create movement and the subject matter parallels Marey's scientific research into the locomotion of animals in phases of movement. Ballas painting "Rhythms of a Violinist" depicts the phases of motion of a violinist's hand and violin in several superimposed positions, creating





Balla ;Paths of movement;swifts.1913.





Balla";Abstract velocity".1913.

the effect of movement by using linear patterns which follow the motions of the hand and violin. In their manifesto the Futurists declared:

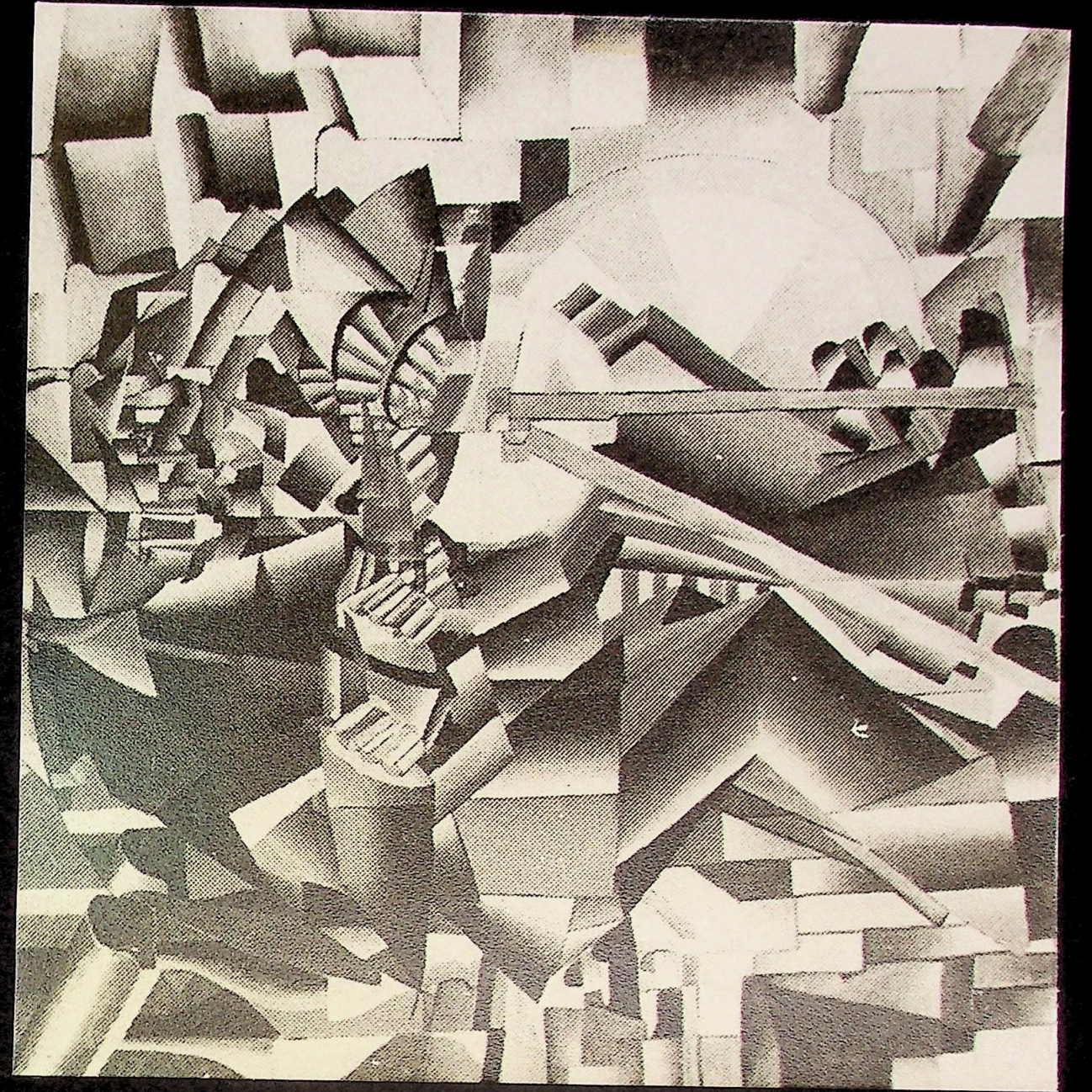
"Thanks to the persistence of vision, that is to say the image on the retina, things in motion multiply, are deformed and follow one another like vibrations in the space through which they pass, motion and light destroying the substance of bodies".

The Futurists preoccupation with movement represented a major change of direction in the Arts and influenced the Cubist movement which many Art Historians believe to be the most important movement in the Art of the twentieth Century. However, the principle achievement of the Futurists was that they developed a new approach to the representation of movement in painting whereby the realistic and naturalistic interpretation of the subject in motion was no longer necessary as the emphasis had changed towards the expression in abstract terms of the movement itself.

#### MOTION PICTURES.

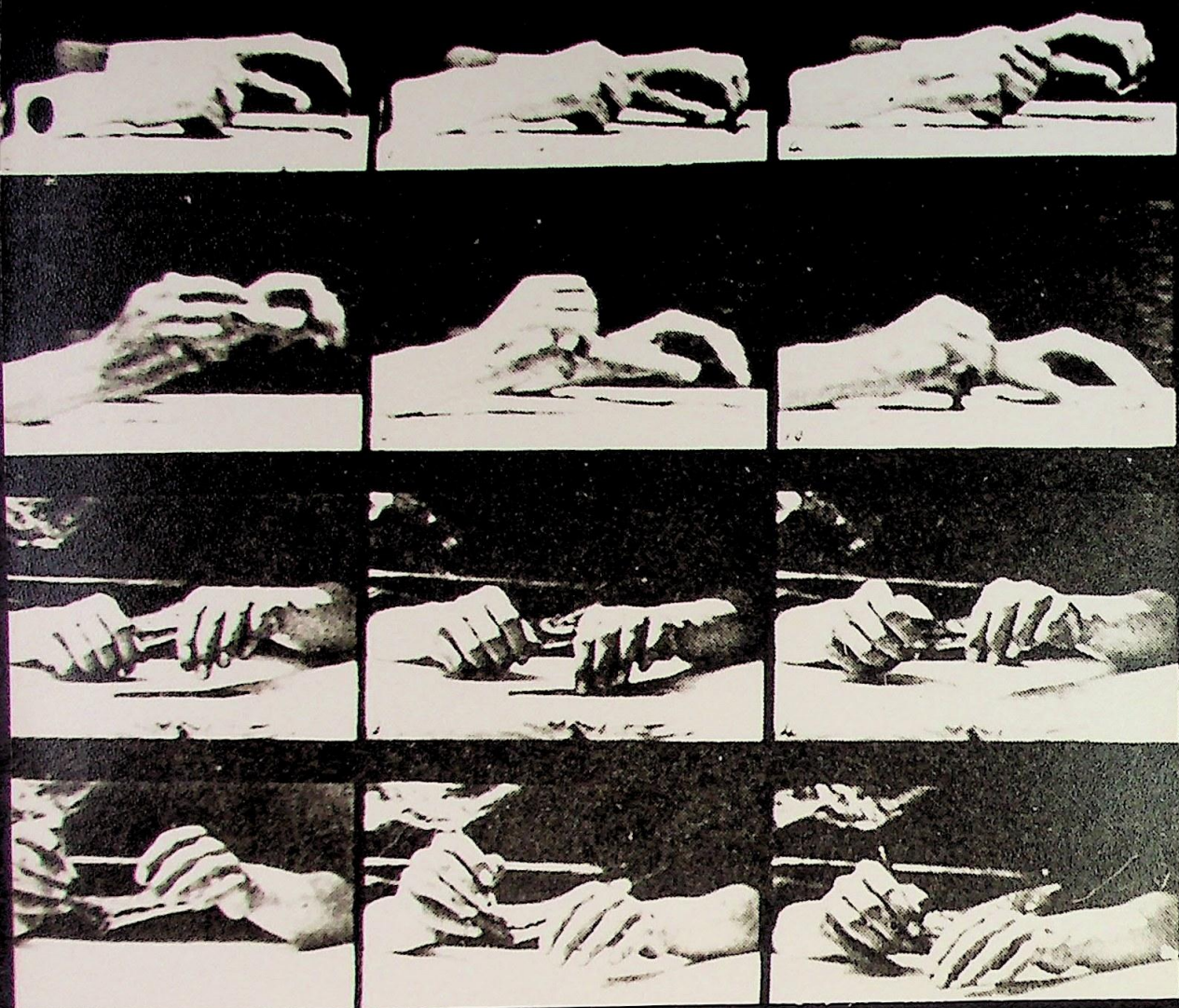
Since Joseph Plateau first discovered the principle of ocular retention of images, otherwise known as persistence of vision, scientists and inventors had applied themselves to the problem of developing a device which could reproduce movement. As we have seen animation was the first stage in the realisation of a means by which movement could be recorded. The next stage in this development was the invention of the Dagnereotype in 1839. Muybridges fast shutter speed photography of stages of motion and his Zooproxoscope which could project sequential motion in a fluid series, was the next stage of evolution. In 1887, Thomas Alva Edison became interested in the problem of recording and reproducing movement. As a result of his experiments into the problem Edison invented and patented a photographic machine which he called the Kinetograph, which used nitrocellulose film. But, the important advance which





Malevich; "sissors grinder". 1912.





Muybridge; Study of hands. 1889.

Edison made was in the technical resolution of the problem of how to record movement on each frame of film in rapid succession. This he did by means of shutter mechanism which opened and closed to expose each frame of movement on to film which ran on a continuous strip in the camera. The shutter mechanism and film reel were syneronized by means of hand crank which meant that if the film was cranked rapidly through the kinetoscope the shutter opened and closed at the same rate as the film thus exposing each frame of film in rapid succession and with continuity of movement reproduction. Edison had solved the age old search for a means of reproducing movement, however, the Kinetoscope was not capable of projecting the images it reproduced, it could only be used to record motion. The finished film could however be seen by one person at a time when the film had been processed it could be put back into the kinetoscope and viewed through the lens which had recorded the images. The problem of projecting the images now presented itself and many inventors sought a solution to this question. However, the kinetoscope incorporated all the necessary principles of persistence of vision and recording techniques needed to reproduce movement in rapid sequence.

The Lumiere brothers of France saw Edison's Kinetoscope and set about inventing a projector capable of projecting Edison's films. In 1895, they produced a machine they called Cinematographe. This invention could project Edison's films which he made with the kinetoscope but when adaptations were to it the Cinematographe could also record movement. The first public screening of this invention was held in the Grand Cafe in Paris in 1895, December 28th. The Lumiere brothers showed two of edisons films and three they had made with the Cinematographe. These films were of a documentary nature and showed people working in factories, crowds in the streets and people at home. The audience were astonished at the sight of moving pictures, its difficult to imagine what effect the reproduction of movement had on the people of that era, when to-day such things have become a part of everyday life and are taken for granted, but the reproduction of movement was considered by people at the turn of the Century to be the miracle of age. The long search for a means of recording motion was finally over, but the history of cinema had just begun.



The documentary films of the Lumiere brothers proved to be highly successful, and film makers continued to make documentaries only until 1899, when George Melies introduced the element of fiction into moving pictures. This was a new departure for cinema, films began to have actors and actresses appearing in them. Stories began to be told through visual expression and captions narrating the dialogue and explaining the story. Melies made many fictional films such as "Voyage to the Moon" (1903), "Journey through the Impassible". His films became extremely popular and were shown all over the world. Gradually a cinematic grammar developed and the films became more complex. The commercial possibilities of cinema began to be seen by big business interests and the film makers formed companies, National film industries were set up in France, Germany and America, very much aware of propaganda uses which cinema could be put to, Governments made sure that they controlled the film companies.

With the increased investment in cinema and the enormous popularity it held, films began to tell complete stories both serious and comic in content. Technical improvements came rapidly in both camera design and film quality, and the language of film was constantly augmented and refined. In a few short years a new and highly profitable industry had emerged which has retained its supremacy to the present day. In America, the film industry developed rapidly, firstly centred in New York, where Edison's Company flourished, using actors from Broadway stages. However, innovations in cameras and equipment made it possible to film out of doors and the industry moved to California, where there was good light and fine weather. The location of Hollywood was where the film makers settled and a city sprang up around them. Hollywood soon became the largest and most famous centre of film making in the world.

Film directors began to make an impression of the style and content of films they made in Hollywood. Directors like David





D.W. Griffith. 1914.





Charles Chaplin .1914.

Griffith began to make more ambitious films, with deeper content and expression, such as "Birth of a Nation" (1914), and "Intolerance" (1916). These films were the first which made people aware of the power of cinema and its effectiveness as a political tool to forge popular opinion and promote propaganda. There were riots throughout the Southern States of America because of bigotry depicted in "Birth of a Nation" which showed Klu-Klux-Klansmen killing black slaves during the civil war. It was largely due to this film which was a very powerful statement by Griffith that cinema began to be considered as an Art form, rather than merely a circus side show.

Charles Chaplin, was the first genius of film comedy in the silent era. He made over four hundred silent films, using mime techniques and a mixture of slapstick and sympathy to great comic effect. In the 1920's the star system developed in Hollywood and became an important feature of American films. This system evolved because of the phenomenon that certain individual actors had a virtually guaranteed audience for every picture they made, because of their popularity. They became the central feature of the film which was only a vehicle for the "Star", Douglas Fairbanks, Mary Pickford, and Rudolph Valentino were three such stars of the silent cinema whose popularity survived even after their deaths. Hollywood dominated the world's film industries as it still does today, however, the European film industry was far more greatly influenced by artistic movements of the time than was the American.

In Sweden and Germany the Art of the Expressionist painters influenced the directors of films who became so highly motivated that they were termed "Expressionistic Film Makers". An extreme example of this is the director Robert Wiene who made the "Cabinet of Doctor Caligari" which used unreal settings and characters for a story of madness and murder. In Russia, the political upheaval of the Russian Revolution was a major influence on the films of Russian Directors.





James Cagney; Film Star. 1946.





Marilyn Monroe; Sex symbol of the 60's

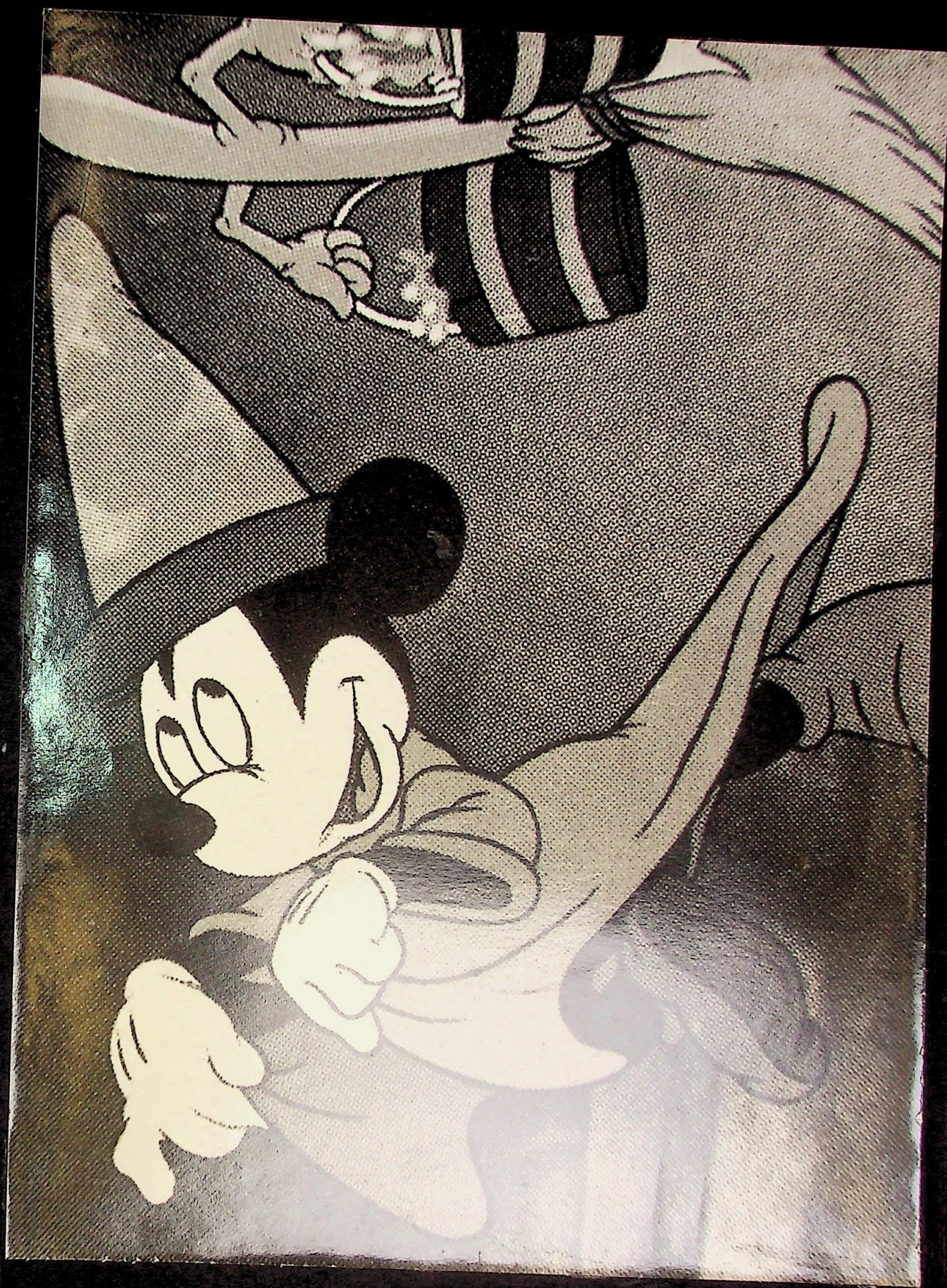
## THE TALKIES.

In 1927, the Silent Era ended with the introduction of sound synchronised films. The first film to use sound for dialogue and music was the "Jazz Singer" which starred Al Jolson. The 'talkies', as they were called, added a new dimension to motion pictures, offering directors and actors a much more scope in which to express themselves. The narrative of films could now have greater complexity and visual imagery developed greater subtlety. The development of the 'talkies' was a direct result of the competition which existed between the film industry and the Radio Networks. For much the same reasons the advent of television lead to rapid technical developments in cinema in the 1950's. In order to compete with television such advancements as technicolour films, cinema scope and three dimensional cinema were developed with the intention of attracting people away from television. The making of epic films such as "The Ten Commandments", (Cecil B. De Mill), in 1956, "Ben Hur" (William Wyler), in 1960 and "Cleopatra" (Joseph Mankiewicz), in 1963, using these new technical developments was a direct result of competition from television companies.

In recent years Cinema has become more divergent in its applications. Originally Cinema was a purely entertainment medium, but, has now developed into a means of expression in some cases, a tool of propagandists in others, a powerful means of education through documentaries etc., and a method of creating greater public awareness of problems through social comment. Film directors have become more individualistic in their style of cinematic production, making their films more highly personalised expressions of their individual concepts and eccentricities. Federico Fellini, Michelangelo Antonioni, and Ingmar Bergman are three such European directors who have emmerged in the last decade.

Cinema has become the instrument for the discrimination of ideas, a powerful means of expression and a universal language for mankind. If the eyes are the windows of the soul, Cinema must surely be the mirror to hold up to life.





Mickey Mouse ; Cartoon Star since 1928.





## CARTOON ANIMATION.

The animated cartoon developed simultaneously with the evolution of Cinema. Both having their origins in the theory of Persistence of Vision. Cartoons as such were first shown in Emile Reynaud's "Theatre Optique" in 1889. Reynaud painted short scenes (which he called Luminous Pantomimes) directly onto a film. The projector consisted of a lamp and a series of lenses. The inventor moved the strip of film through the aperture in front of the lamp and the images were thus projected onto a white screen. In 1908, Emile Cohl utilized the photographic process for cartoons using a machine similar to that of Reynaud. Cohl's photographic cartoons enabled him to make a negative of his drawings which was then projected creating movement in the sequential drawings.

In America, where newspaper comic strips were very popular and were developed into comic strip magazines, the animated cartoon was invented by a comic strip artist Pat Sullivan and cameraman Otto Mesmer, when they created an animated cartoon called "Felix the Cat" in 1920. Felix was the first anthropomorphic animal to appear on the screen and he rapidly became famous. His personality and actions approximated most closely with those of Harold Lloyd and Buster Keaton of the Silent Cinema.

The concept of imbuing animated animal cartoons with human behavioural characteristics was taken up by Walt Disney in 1928. He developed the technique of animated cartoons to the degree of perfection which they have attained up to the present day. His principle contributions were the invention of the "Storyboard" in 1930 and the introduction of a system of animation called "Limited Animation". This was a system which separated each drawing into various moving parts so that some parts could be animated while the others remained still. The technique of "Limited Animation" effectively reduced the number of drawings which were necessary to achieve a particular set of movements. Each part of the drawing was painted on transparent plastic sheets which when superimposed formed the whole drawing, but each layer of the drawing could be changed



and animated continuously, thus creating the movement. Using this technique Disney made many full feature length animations such as "Snow White and the Seven Dwarfs", in 1937 and "Fantasia" in 1933. His most famous cartoon character was Mickey Mouse but many of his creations have survived to the present day. For a time Walt Disney had an almost complete monopoly in the field of Cartoon animation and continued to produce full feature length animations until his death in 1966. He made "Bambi" in 1946, followed by "Lady and the Tramp" in 1956 and many others. The Walt Disney Company continues to dominate the cartoon animation industry and more recently produced "Jungle Book" and many short animated cartoons.

#### EUROPEAN CARTOON ANIMATIONS.

In Germany, painters such as Viking Eggeling and Oskar Fischinger began to become interested in animation, replacing paint and canvas with cine-camera. The now famous Moholy-Nagy a teacher in the Bauhaus experimented with animation techniques using the camera to achieve kinetic effects. In 1933, the Bauhaus was forced to close after Adolf Hitler seized power in Germany. Moholy Nagy went to New York where he met Hans Richter a fellow countryman, who had also been exiled by events in Germany. They began to explore animation techniques using various media, such as animation of cut-out paper cardboard, live animation techniques and expressionistic cartoon animation.

In France, Robert Lortac, who was a student of Cohl, made a series of cartoons on the subject of Futurist machines invented by his character "Professor Meccano". Berthold Bartosch and Frans Masereel made a film in 1932 called "L'Idee", with shapes and light effects derived from Expressionist Paintings. In 1933, Antony Gross made "Joie de Vivre" which was in the style and manner of Art Nouveau. Animation began to develop in Poland, Great Britain and Czechoslovakia. However, in Czechoslovakia the tendency was towards puppet animations which is still the case to-day. The animation of puppets has now become widespread.



## RECENT DEVELOPMENTS IN ANIMATION TECHNIQUE.

Animation has advanced in many directions in recent years. The scope of animation has broadened and the range of techniques open to the animator has been extended. Inovations in animation correspond to the developments in photographic technology, such as the invention of the Rostrum Camera. This allowed live action films to be synchronized with animated drawings creating films which had actors and cartoon characters moving in unison on the same film. Another development has been the use of animation in science fiction and thriller films where models and puppets are animated and superimposed with the live action. The film "2001 a Space Oddessy" was made using this technique, as was "Star Wars". In these films small models of space craft, planets and astronauts were animated using computer controlled cameras and later edited in the printing stage of the live action film.

Animation of sophisticated puppets which can alter expressions and move fluidly has become extremely prevalent in animations which are made for television. Because no drawings are used in puppet animations the process is a relatively rapid method of animation. The puppets are manipulated and photographed then moved very slightly and photographed and so on until the correct number of frames per movement have been shot to produce fluid motion. This process is closely related to television techniques because of the mobility of the camera around the puppets and the three dimensional sets which are used suit television.

Other inovations have been the animation of "real" objects using found objects such as wood, nails, bricks and using them to tell a story by animating the still objects. Time lapse photography involves the animation of animate objects such as flowers, clouds etc., showing the events of a long period of time in a few seconds. Norman McLaren a Canadian animator has been the most versitile and expert exponent of animation techniques. He has used many unusual and inovative techniques of animation, developing a new means of expression

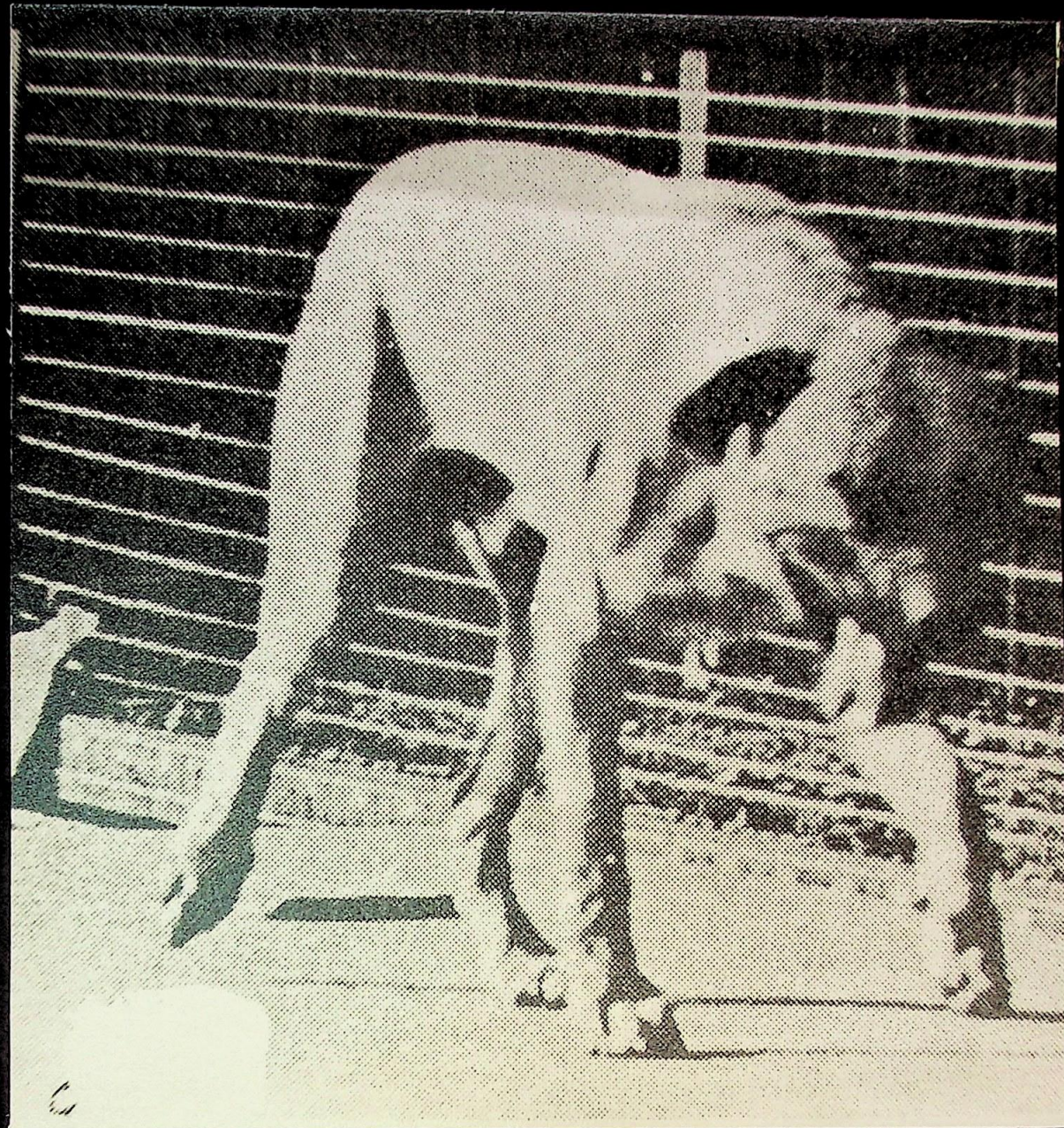


in every film he makes. The revolutionary animation techniques of McLaren illustrate for animation has come and how much further it can still be expanded.

#### THE USES OF ANIMATION IN TELEVISION.

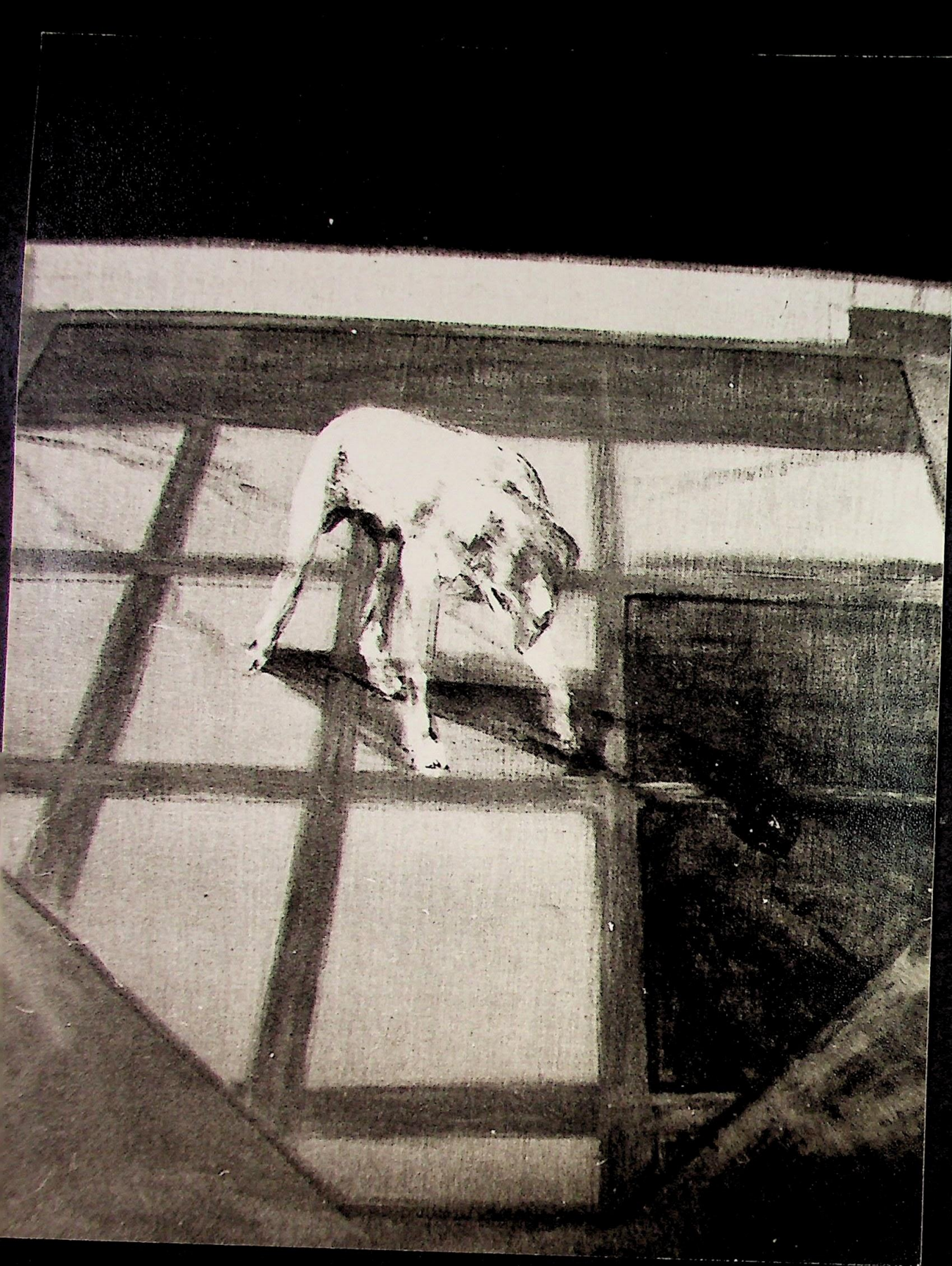
Animation has been used extensively on television in recent years. Childrens programmes utilise animated cartoons and puppets for educational purposes and also for pure entertainment. Programmes which deal with a variety of topics such as documentaries and scientific programmes frequently use animations to demonstrate processes in a more direct way. But, the greatest use of animation in television is undoubtedly in commercials which are predominately animations of one form or another. In an average week over 60% of television advertisements use animation techniques to sell their products. The reason for this is obvious, advertisements, cost an enormous amount of money to make so it is important that the message is put across to the public as quickly and appealingly as possible. Advertisers have realised that the most efficient method of utilising the 15 to 30 seconds which most commercials have on television is through animation. These advertisements involve animation of real objects or use cartoons. Other examples fuse animated cartoons with live action or animate still photographs which have sequential patterns creating a flashing effect. Prior to legislative controls some television commercials contained a number of single frame messages which were not visible to the naked eye but were registered in the subconscious which urged people directly to buy products which they did not want. This is called subliminal advertising and is now illegal. The proliferation of animated commercials must also be due to the popularity which animation enjoys and the fact that people of all ages respond to animated cartoons favourably. Another factor in the advertisers view is that the scope of animation technique is greater than that of film techniques. The imaginative scope which animation allows, where the impossible can be made into visual reality. Advertisers use highly sophisticated techniques in order to get a message across and sell products. Their psychology is based on endless research and it must be assumed that they believe that animation is a powerful medium of expression.





Muybridge's study of a dog from which  
Francis Bacon painted "Dog" in 1951.  
Bacon's "dog" is on the overleaf.





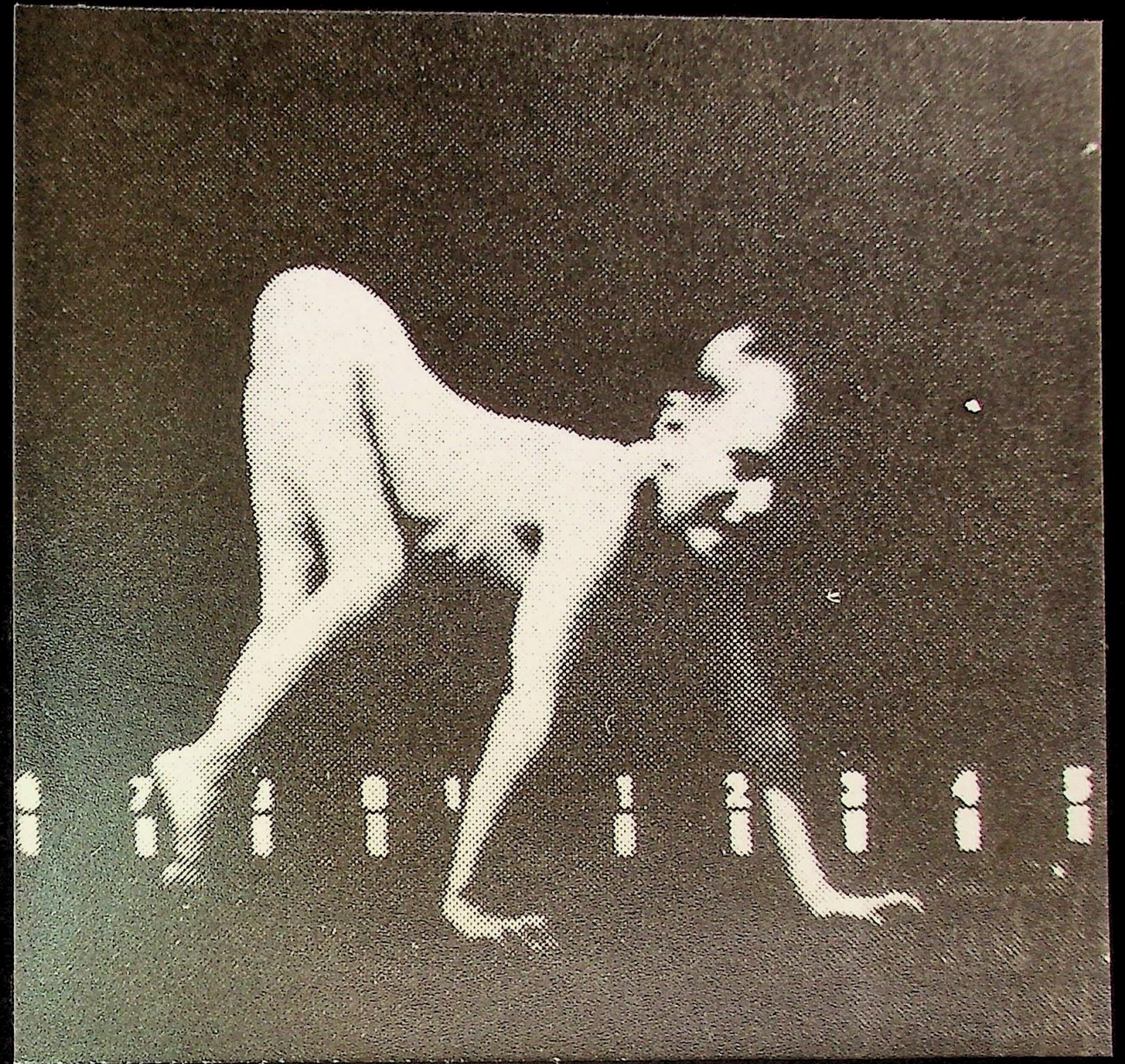
## THE INTERACTION BETWEEN ART AND PHOTOGRAPHY.

Since the invention of the camera in 1839, the role of the artist has changed fundamentally. The transformation has been gradual but, the consequences of the photographic image are being felt to the present day. For centuries artists had been striving to achieve "truthful" reproductions of reality. This aspiration was formalised during the Renaissance where it became a vital ingredient of painting and sculpture. The emphasis on Realism continued into the 18th Century having by this time become a dogmatic principle of art. The artist was at that stage the depicter of reality. The "Truth" in painting was the faithful rendition of nature. This concept prevailed simply because there was no other means of recording a visual image other than by drawing or painting it. So the objective of the artists, it seemed, must be to record the image as accurately as possible. The "Truth" of a painting therefore lay not in its expression but rather in its rendering of reality and anatomical accuracy in recording nature.

The advent of the Daguerotype lead to a dilemma for the artists who had for so long believed that "Truth" was adherence to naturalism. Suddenly, a machine could faithfully record nature far more accurately than any artist could hope to do. Confronted by this dilemma artists chose either of two courses. The first course was to ignore the photographic image completely and pretend it did not exist and continue in the same manner of painting. The second course was to use photography in painting and compete with the camera.

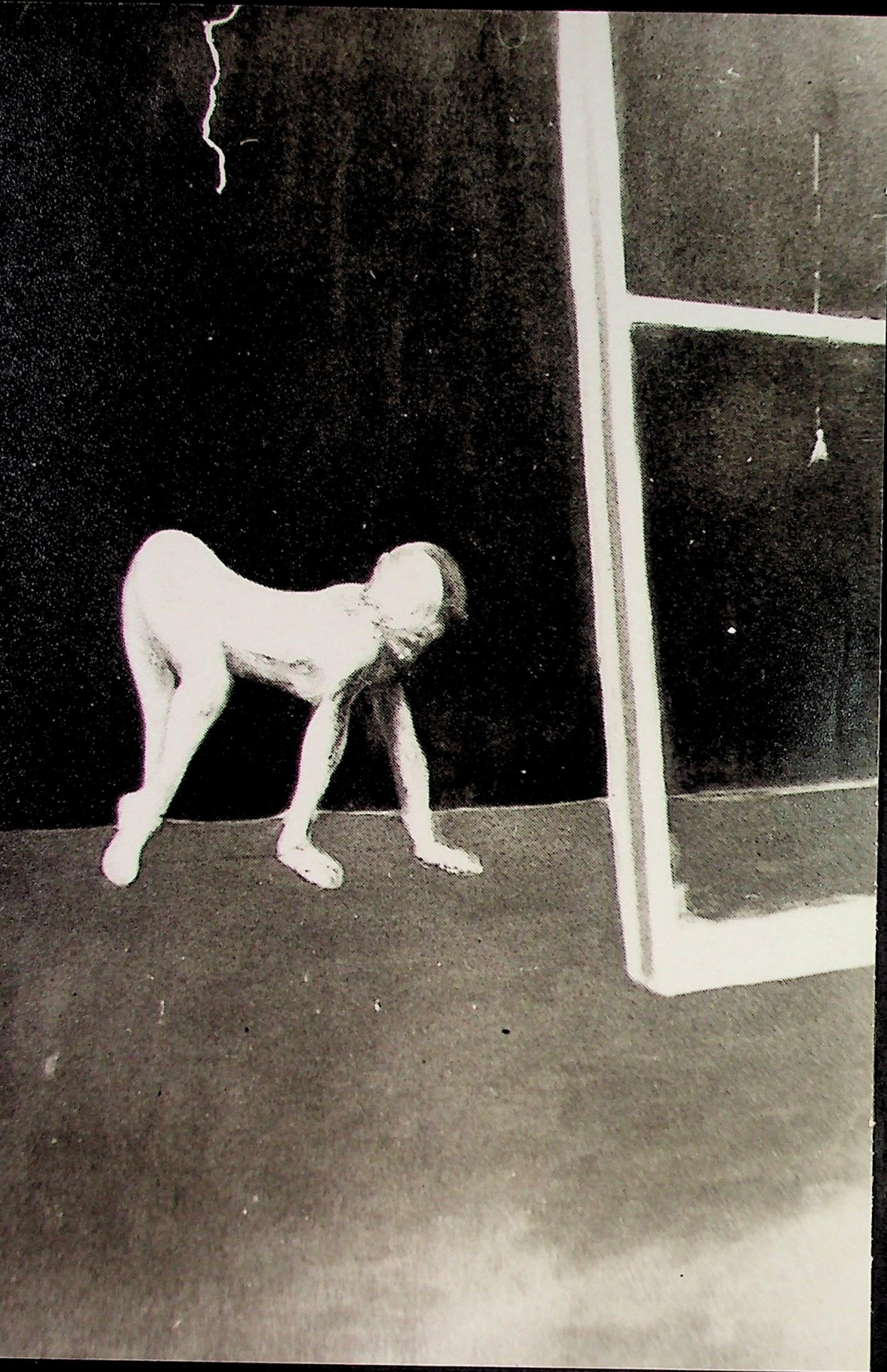
It became increasingly obvious that the dilemma which artists faced would not be resolved by either ignoring or competing with the photographic image. As photographic technology improved the term "Truth" in painting became meaningless in its old context. The artist had to find a new "Truth" and in the course of this quest the role of the artist and the history of art was transformed utterly. The artist had been liberated from constraints of reproducing nature accurately by the





Muybridge's photograph of a deformed child crawling.  
Francis Bacon's painting taking the same subject and  
using the Muybridge study is on the overleaf.





introduction of the photographic image.

#### PHOTOGRAPHIC INFLUENCES ON ART AND INFLUENCES OF ART ON PHOTOGRAPHY.

Many artists began to use the aberrations of photographic images in painting. The new freedom which photography offered the artist began to be felt. The Impressionist Movement with its emphasis on light owes something to the interest photography created in the science of light. On the other hand many photographers mimicked the style of impressionism by creating hazy impressionistic photographs. This process of photography borrowing from Art and Art borrowing from photography has continued to the present day. The Futurists utilised the aberrations of the cinematic image just as Expressionist Film makers used Expressionist Art as a means of expression. The Pop Art movement used photography almost exclusively. "New Realism" became a movement in America which used photographic images directly and attempted to surpass the photographic image with the painted reproduction of it. Film makers are constantly being influenced by artistic movements in the style or philosophy of their films. With two such closely related visual media it would be unusual for them not to inter-react in this way.

#### ANIMATION AND ART.

Animation is even more closely related to Art than is photography. The techniques of animation involve and incorporate all aspects of Art. Yet animation is not so much something better than Art as it is an extension of it. A means whereby Art can be transformed into a new and more immediate medium. The representation of movement through animation involves the animation of sequential drawings or paintings whereas the depiction of movement in Art is limited by the fact of their being only one image within which movement can only be implied. The Futurists were perhaps most directly concerned with movement in painting and their



utilisation of animation techniques formed the basis of their philosophy. Animation offers a new medium to the artist, a new means of expression and a new outlet for creativity and imagination.



ANIMATION IN AN EDUCATIONAL CONTEXT.

Thomas Edison, inventor of the cine camera, did not patent his invention because he envisaged its use purely as an educational aid. He did not foresee that it would become a highly profitable entertainment medium. His misjudgement caused him to lose all royalties from the copyright of the movie camera. This apparent blunder on his part is understandable when one thinks that perhaps he was correct in his original assumption that cinema is an educational tool. Film has been used for many purposes, for instance, propaganda, entertainment, self expression, journalism, education etc., but it is perhaps in the field of education where its use is most valuable. The amount of information both visual and verbal which can be transmitted through the medium of film is immense. The advantage of film is that it is both educational and interesting. The use of film and television for educational purposes has become increasingly popular and many schools have recently placed more emphasis on audio visual educational methods.

Extensive use is made of video tape recorders, projectors etc., in modern schools. Television programmes for schools have been introduced such as "Telefis Scoile" which are designed to augment the school syllabus and act as an educational visual back up to the work in the classroom. Documentary programmes have a role to play in education as they are both highly informative and visually interesting. Many of these documentaries use animations to illustrate complex operations in a visually comprehensible way, in order to condense as much information as possible into an immediately recognisable and appealing form. Diagrams, graphs statistics, functions etc., can be represented as animations thereby, presenting rather tedious information in an exciting and stimulating way.



One of the most popular educational television programmes of recent times has been Sesame Street. This programme is aimed at pre-school children and uses animations and puppetry in order to illustrate the meanings of words and their spelling. The animations are such that they create interest through their visual imagery, the learning material is presented in an equally interesting way and the learning process is reinforced through repetition using various animated characters. Young children find this method of learning fascinating and its educational strength obviously lies in its use of animation in a highly sophisticated way and the visual imagery it presents.

#### THE ADVANTAGES OF ANIMATION IN EDUCATION.

We learn through our senses of sight, hearing, touch, taste and smell. The sense of sight and hearing are the two most important receptive organs in educational terms. That is why audio-visual aids are so beneficial to education but animation which feeds both facilities, stimulating the eyes and reinforcing what the eye sees with sounds or narration, makes animation an ideal educational tool and a superb audio-visual aid. Many schools have audio-visual equipment such as slide projectors and even video tape recorders. Each of these is useful to the teacher but each limited in its educational value. A slide projector or tape recorder on its own does not have sufficient educational value. A film or animation can be totally educational in that it can fuse the audio and visual elements together to form a complete educational tool which can communicate on both levels simultaneously.

The advantages of using animation techniques in the classroom are numerous. The disciplines required in animation are more stringent than those involved in Art. The drawing skills required demand more thought and imagination than does drawing for artistic purposes. The ability to project what type of movement will be achieved in a progression of sequential drawings requires a perceptive ability and a knowledge of the limitations of the camera. Animation uses drawing and painting



skills but to a totally different end and introduces movement to the otherwise 'still' world of art. Problem solving is a major factor in animation. Problems such as how to create movement, how to design characters, how to build sets, how to structure the story, how to film the drawings or puppets in a cohesive gramatical way, how to get an idea across etc. All of these problems must be solved as the animation progresses and the finding of solutions is part of the learning process.

Another advantage of animation is the scope for experimentation it offers students, the many different types of animation techniques that can be explored and used as a means of expression.

#### THE APPLICATION OF ANIMATION IN A TEACHING SITUATION.

Animation has many advantages in relation to Art Education. The application of animation within the syllabus of the art curriculum would enhance the visual and creative awareness of the student and encourage a deeper understanding of painting, design, sculpture and craftwork. Animation involves the fusion of these elements of art and so would help to break down the barriers between separate areas of art. The elements of animation namely movement and light can be utilised in an art context to become a medium of expression and a vehicle for the imagination which surpasses the still image of painting or rigidity of sculpture. All aspects and branches of art such as design, sculpture, craftwork, painting, drawing stage-design, puppetry etc., can be incorporated and developed within animation. The possibility of using mixed media in both two and three dimensional form exists in animation making it a unique art-form.

The problem solving aspect of animation, the degree of scope for experimentation and imagination and the close relationship between art and animation all contribute to the suitability of animation in an art teaching context. Art teachers could



use animation as both a tool to educate students in the development of their visual perception and as a means of expression and experimentation in various materials and techniques. All aspects of art education can be incorporated within the scope of animation. The visual and imaginative developmental process which is involved in artistic creation are the same as those required in animation. Therefore, animation lends itself to art teaching in that the primary concern of the Art teacher is the development of visual awareness, self expression and imagination all of which can be achieved through animation.

Other advantages of animation in an art teaching context are that animation by its very nature and the work output it demands encourages creativity among students. The demands of animation are such that co-operation is required between students in order to complete an animation project. Students working in groups or collectively must rely on one another and learn to co-operate with each other during the animation project. Another aspect to animation is that the students imagination is not restricted to reality, in an animation anything can be made to happen to achieve the translation of an expression or emotion or idea into cinematic reality. The scope of animation is only inhibited by the lack of imagination or fear of experimentation. The lack of adequate equipment will of course limit the animators scope but resourcefulness and imagination can often compensate for this factor. The basic equipment required for animation is a movie camera which has the facility of single frame exposures, a light source either daylight or photo-flood lamps and an animation stand or tripod. This equipment is available in most schools and is all that is required to begin making animated films.

#### INCORPORATION OF OTHER AREAS OF EDUCATION IN AN ANIMATION PROJECT.

Having the basic equipment necessary for animation the art teacher is ready to explore the world of animation. A



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#### INCORPORATION OF OTHER AREAS OF EDUCATION IN AN ANIMATION PROJECT.

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project on animation can be developed and other areas of the school could be incorporated and involved in the project. Once the project has been initiated it is possible that the woodwork and metal work areas could be brought into the production to help with the construction of sets and puppets supplying both the materials and the skills required in construction. The English department could be involved in the writing of the storyboard and narrative which would be based on the puppets and sets which had been constructed. The music department could become involved in the production perhaps by recording background music and sound effects which could be synchronised to the finished animation.

The advantages of this type of project would be immense, both complimenting the artistic aims of the teacher while enhancing and enriching the students visual development and perception. The involvement of other areas of the school would also help to create greater co-operation between areas extending art into other creative educational fields in a positive way. Another aspect of animation in a learning situation is that it would foster a critical objectivity, a greater understanding of film and film technique and grammar would be gained. The broader concept of cinematic history could be explored and the animations of other exponents of animation techniques could be examined. Animation is an ideal method of exploring Art through a new medium and it therefore has many applications in art teaching.

#### HOW ANIMATION CAN BE PRACTICALLY APPLIED IN THE CLASSROOM.

Practical incorporation of animation within the art teaching syllabus could be achieved at all levels of Secondary Art education in the following manner:-

#### FIRST YEAR

STAGE ONE: Exploration of movement through life drawing.



Drawing the figure in motion.

STAGE TWO: Examination of how movement can be achieved in pictorial composition.

STAGE THREE: The study of movement through design of a flick-book, creating movement through sequential drawings which are contained in a booklet and flicked to create the movement.

STAGE FOUR: Making paper puppets out of card which have moving limbs, these are designed along with a background and animated using a movie camera to tell a short story, resulting in an animated film.

#### SECOND AND THIRD YEAR.

STAGE ONE: Animated film of cut-out coloured paper shapes, creating rhythms and movement and experimenting with story-telling techniques using cut-out shapes.

STAGE TWO: Montage animation. Magazine photographs are cut out and a story is developed around the set of characters which are then animated.

STAGE THREE: Plastercine puppet animation. This involves the modeling of plastercine characters which can be moved and animated. Sets and backgrounds must also be designed and built.



## FIFTH AND SIXTH YEAR.

STAGE ONE: Puppet animation: Puppets made out of various materials which can be manipulated and animated. The design of sets and backgrounds.

STAGE TWO: Live action animation of Stop motion animation involving the animation of real objects and "live" objects such as clouds, flowers ect.

STAGE THREE: Drawn and painted animation. This involves the animation of drawings which are sequential forming a cartoon animation.

## FIRST YEAR

### STAGE ONE

#### EXPLORATION OF MOVEMENT THROUGH LIFE DRAWING.

An examination of movement using life drawing as the starting point and extending it into a close analysis of the human body in motion would be a useful introduction to animation. The essence of animation is movement and therefore the study of the mechanics of body movement would not only create an awareness of movement but would also lend more interest to the subject of life-drawing. In order to draw the sequential movement of the body close scrutiny of the muscle and bone structure would be of benefit in gaining a deeper understanding of how the body moves. Drawing the figure in motion in sequential



pattersn and rhythms of movement is the first step to understanding movement.

#### FIRST YEAR

#### STAGE TWO

#### MOVEMENT IN PICTORIAL COMPOSITION

Having studied how the body moves the next stage is to explore how movement can be depicted in pockorial composotion. Examples of how various artists through the ages have solved the problem of representing movement in painting and sculpture would help to illustrate this complex problim. An examination of the effects of the invention of photography on the representation of movement in art during the 19th century would help to illustrate the historical background to animation. The photographs of Edward Muybridge and Mallet could be used to show how photography influenced the representation of movement in painting by showing photographs of Muybridge and paintings of the same period which depicted movement. The Futurists work could be used to illustrate how same artists used movement exclusively and how they were influenced to a large extent by the cinema. The solution to the problem of representing movement in pictorial composition could then be set as a project each student having to find a means of depicting motion.

#### FIRST YEAR

#### STAGE THREE



## THE STUDY OF MOVEMENT THROUGH THE DESIGN OF A FLICK BOOK.

Having first studied body motion and pictorial movement the next stage is to try to create movement. The simplest and most direct method of doing so is by making a flick book. The flick book is one of the earliest methods of animation and contributed to the theory of Persistence of Vision which in turn contributed to the invention of the movie camera. Consequently it is a very suitable method of introducing animation techniques to students. The Flick Book is made out of a number of similar sized cards on which are drawn sequential images. Simply by flicking the book the separate images merge and appear to move. The simplicity of the flick book does not detract from the fact that the flick book incorporates the basic requirements of film animation, it contains the principle of persistence of vision and included the sequential drawing element of animation. The flick book can also tell a short story pictorially which makes it an ideal method of introducing animation.

### FIRST YEAR

### STAGE FOUR

### PAPER PUPPET ANIMATION

Through the flick book an understanding of the processes involved in film animation can be achieved and the next stage is to use film to create movement. The equipment required basically is a movie camera which can take one picture at a time and lights which are not essential if strong daylight is available. The process of camera animation and how a camera operates should be explained to students firstly. Knowing how a camera works is



essential to an understanding of film animation. The class working in groups develop a paper puppet character and this puppet should have moving parts held together with paper clips or pins. The object should be to develop a character which has moving limbs which can then be animated using the camera to create the movement. Once the paper puppet has been constructed the next stage is to develop a story around the character and paint backgrounds and props which fit into the story. As it would be impossible for the whole class to operate the camera it is perhaps best if the work when finished is animated by the teacher or alternatively by each group, one at a time. Paper puppets allow the achievement of smooth movement and are simply constructed out of card on paper. The finished result should be a number of short-stories with backgrounds and moving characters which can then be projected in the class and analysed as to the success or the failure of the stories of the smoothness of the movement.

The value of this exercise is four fold.

- (1) The painting and building of the characters and backgrounds involves design and painting.
- (2) The story element of the animation is introduced.
- (3) Movement is achieved simply and effectively.
- (4) Critical ability is brought out and co-operation within the groups becomes important.

#### SECOND AND THIRD YEAR.

##### STAGE ONE

##### CUT OUT SHAPES ANIMATED

Coloured paper or card can be used in animation and can in fact illustrate simple stories. Shapes cut out and



animation can be made to move in many different ways, circles for instance can be animated and made to jump, roll, bounce ect., and move in many directions. Pictures can be formed or dissembled ect. using this technique which is very simply achieved and very effective if painstakingly done and well thought out, it requires the ability to imagine how a sequence of movement will appear when projected.

## SECOND AND THIRD YEAR.

### STAGE TWO.

#### MAGAZINE CUT-OUT ANIMATED MONTAGE

The starting point for this technique of animation could be collage work, using magazines as a source material and formulating collages which illustrate a theme or expression. The technique is quite straight-forward and involves the use of magazines or photographic material of any type. The images are selected from magazines ect., and cut out carefully, these form the characters of the animation, photos of animals, people, buildings ect. can be used. The next stage having chosen your cast of characters is to develop a story around them taking into consideration the movements which they are capable of and the degree to which they can be altered to move limbs, mouths ect. The story should be quite simple and should be treated purely visually. The characters or images should be moved in accordance with the story and as smoothly as possible so that when projected there should be a co-hesion between the movement of characters and the narrative of the story, sound effects or music could be added later to enhance the story. A theme running through the animation also helps to bring a certain co-hesion to the film.



## SECOND AND THIRD YEAR.

### STAGE THREE.

#### PLASTERCINE PUPPET ANIMATION

Taking animation into three dimensions can be done very simply creating the characters out of plastercine and using cardboard props. The method of animation remains the same but the advantage of three dimensional animation is the ability to move the camera around the subject therefore offering more flexibility to the animation. Sculpturing of the characters and designing of sets and backgrounds is another advantage of this technique of animation. The story aspect of animation can be developed to its fullest in this medium and quite complex story structures can be used illustrating emotions and expressing ideas. The making of this type of animation could involve a whole class in the construction of sets and puppets, and the design of backgrounds. The co-operation of other areas of the school could be brought into play, such as the woodwork department helping with set design or the English department collaborating on the script and story board.

## FOURTH AND FIFTH YEAR.

### STAGE ONE

#### PUPPET ANIMATION - MULTI MEDIA

Puppets can be made out of a variety of materials such as wood, cloth, plaster, nails, metal, wool etc., this form of animation is used in many educational programmes such as "Sesame Street" and other childrens entertainment programmes such as "Bosco", "The Magic Roundabout", "Noddy",



"The Wombles, "Paddington".ect. and it involves the building of sets and puppets from many different types of material and sculpture is also involved to a large extent. The starting point could be an exploration of how the mechanics problems of making a puppet of say wood could be solved given that it must be able to stand walk, sit, move its limbs ect. and once this problem has been solved the actual animation can begin. The background and sets can equally be treated as problems solving devices which have to meet certain requirements and fullfil the requirements of the characters who will be moved around them. This form of animation requires a high degree of craft and skill. The problems which arise during the construction phase give rise to experimentation and developement of solutions. As with plastercine figure animation the camera is less restricted because of the three dimensional aspects of this type of animation, the scope for imagination and expressing and experimentation because of the variety of materials which can be used. Again co-operation with the woodwork and metalwork areas of the school would be of advantage to the success of the project.

#### FOURTH AND FIFTH YEAR.

##### STAGE TWO.

##### LIVE ANIMATION (STOP MOTION PHOTOGRAPHY).

Live animation uses live or real objects and by animating them can create illusions which are quite astounding. A flower can be made to open and close, clouds can be made to rush past at high speed and trees can bloom, shead their leaves and Bloom again all in a matter of seconds. This type of animation is very simply achieved and can be useful in studying nature. The Stop action animation can be used to animate vertually anything including people, household objects,



flowers, trees, clouds ect. and can be used for educational films where the subject or event takes place over a long period the use of stop motion photographu can condense the event into a few seconds and so new light can be shed on both scientific and natural occurances.

#### FOURTH AND FIFTH YEAR.

#### STAGE THREE.

#### DRAWN AND PAINTED ANIMATION.

The drawing of each seperate movement of an animation in sequence is perhaps rather labourious but very rewarding and while slower than the other methods of animation it offers advantages in that the complexity of the story can be greater than any of the other methods. Another advantage is that the sheer amount of drawing necessary to make even a short band drawn animation creates a draughtsmanship approach to drawing and gives drawing a new value. This method of animation would require the co-operation of the whole class in order to meet the stringent and highly disiplined requirements of the medium. The class would have to developpe the characters and backgrounds and each set of drawings would have to match each other set of drawings in every detail of character, expression, colour, line thickness ect. The first stage, however, would be to developpe the story then design the characters and the background to meet the specifications of the story. This achieved it would be nesessary to divide the class into groups.

- (1) One group dealing with the backgrounds entirely.
- (2) Another group working on the characters of the cartoon and their movements.
- (3) Another group painting the same characters on to acitate .



(4) Another group checking that the characters and colours are kept consistent throughout.

(5) Another group filing the finished acetate cells with the characters and backgrounds. With each group working in co-operation it would be possible to make a drawn and painted animation which could be completed in various stages over the course of a year. The amount of work involved in hand-drawn animation is enormous but is a very rewarding type of animation and offers a great deal of scope for imagination and creativity.

#### CONCLUSION

The incorporation of animation with the Art Syllabus of Secondary Education would be of great benefit to the students in the development of their visual awareness, creativity and self-expression. The art teacher would have an added dimension to art within which the range of materials and scope of imagination is unlimited. The inclusion of other areas of the school in an animation project would facilitate a broadening of the perspective of art education. The advantages of animation in an educational context are consistent with the aims of art education and animation is an extension of the artistic and creative process so that animation is perfectly compatible with art education. The educational value of animation as an audio visual aid is an aspect of animation which could be explored by art teachers by making animations on specific educational themes. Animation is an ideal method of experimenting with film techniques and understanding the language of cinema. The objectivity which an animation encourages is essential to understanding the pervasive bombardment of the individual through the media of television and cinema etc. Animation offers the art teacher a new approach to art education through animation techniques. It also offers a means of fusing the different fields of art education such as design and painting, sculpture, and set design etc. to create a new awareness of the way in which different branches of art can be utilised within the framework of animation. An understanding of movement and how movement



and how movement can be represented is perhaps the most important feature of animation which can be learned in the process of making an animated film. Animation opens up a whole new visual world to the art teacher and students involved in it.