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C A L L I N G T H E S H O T S

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C O N T E N T

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CALLING THE SHOTS

INTRODUCTION.

The title of my essay deals with how we as observers view images. We are an audience when we watch a film in the cinema, we are seeing something that is not really moving. What we are seeing is a sequence of images, each image slightly different from the next. When a sequence of images is viewed in the cinema, the reel of film moves so fast that we cannot see the difference between each image. The motion of these images is apparent that is they only appear to be moving.

The first chapter of my thesis s divided into two parts. The first part is a historical background into the lives of the people of Europe and Victorial England. I also want to mention the type of entertainment that was available to society and how the audience responded, this compares with their response to the 'chase films' of the early motion picture. The first part of the chapter concludes with the introduction of the 'Persistence of Vision' and begins the second part of the chapter. In this part I propose to introduce a proportion of the inventors and scientists who created optical devices in the 19th Century. I would like to begin with the work of John Ayrton Paris and finish with the Lumieres.Many of the early inventors like Joseph Antoine Plateau and Simon Ritter von Stampfer created their optical devices to explore the idea of the 'Persistence of Vision' The Persistence of Vision is a characteristic of human perception first known to the ancient Egyptians and later described by Peter Mark Roget in 1824.This theory was responsible for the development of visual

awareness in the ensusing decades. Subsequent experiments led to an interest in science and technology on colour vision and the action of the eye. In 1850, a German Psychologist, Herman Von Helmholtz published his studies of the eye and the psychological optics. At this stage the objective interest in optical theory was to further scientific research. Later the emphasis would lean more toward the commercial demand that would lead to the birth of cinema.

My second chapter is devoted to Perceptual Theories. I want to discuss those theories and the various experiments that were developed to demonstrate the, These theories include the 'Persistence of Vision' and its association with the notion of apparent movement'. Both of these are linked to the Threshold of Perception and are created by film. From there I will mention how the audience perceives the images they have seen on the screen, and how aware they are of the images they see. Then I would like to differenciate between how we 'picture' and how we 'describe' and say why imagining is like describing rather than picturing. I want to discuss the mental respresentations involved in Perception and how similar they are to the representations involved in mental imagery. Imagery includes an object which is the subject of our image,and area,the environment of the subject. In film these are represented in a narrative form, this leads me to my final chapter on Narrative. Narrative is the manipulation of time and space executed to conceive a story. In this chapter I want to mention how George Melies discovered narrative and how he used it in his most successful film 'Le Voyage dans La Lune'.

George Melies is credited with influencing another director Edwin S. Porter in his production of films like the 'Life of an American Fireman' (1903) and the 'Mill Girl" (1907). These films were the first to explore and develop various types of narrative. Many directors like Melies limited their development of narrative because they always kept the camera at a fixed point of view. From here I would like to discuss the technique of parallel editing and how it was used to reveal simultaneous action, this compares with early filmmakers who often showed the relation between two separate areas by panning the camera from one space to another. The essential action being directed in such a way that the audience would grasp the highlights of the scene. Here I would like to say how the audience were persuaded into perceiving film as reality through the editing of time and space. This will then conclude my final chapter.

C H A P T E R O N E

(i) Setting the Scene

(ii) The Creators.

(i) SETTING THE SCENE.

Nineteenth century Europe had many people to entertain and no expense was spared to keep the social classes amused. In England in the 1820's the theatres and music halls were visited by the upper and middle classes. Acrobats, clowns and jugglers performed in the music halls.The audience joined in with the jokes often vulgar sang along or threw rotten fruit if they really disliked of the entertainer.If the audience really engjoyed your act they would throw pennies onto the stage.Upper and middle classes thrived on plays about murder and ghosts.The crowd loved excitment and would cheer on the heros and hiss the villans.

The nineteenth century was the era of the Industrial Revolution in Europe. It was a time of materialism when possessions of worth were of the utmost importance.

Victoria was Queen of Britain, and Britain like the rest of Europe was enjoying great prosperity. The middle class gained most from this prosperity and the poorer class were looked down upon. There was an attitute among the middle class that you got where you were by working hard, staying sober and saving your pennies. The middle class believed that the poverty experienced by the poorer class was a direct result of their laziness, yet the poorer classes worked hard often fourteen to sixteen hours a day, six days a week but they were poorly paid. Many factory owners preferred to employ women and children whom they could pay less.

In the 19th century the upper and middle classes found they had more time to indulge in pastimes. Scientific research had led to an awareness in the public, young ladies and gentlemen in Europe

began to investigate into the wonders of modern science. For women of upper class who could not work because it was considered socially unaceptable, this indulgence offered entertainment while the young men were looked on as broadening their horizons with their new hobbies. Their investigations and the work of inventors like Paris and Plateau were not considered commercially competitive until around the time of the 1850's.

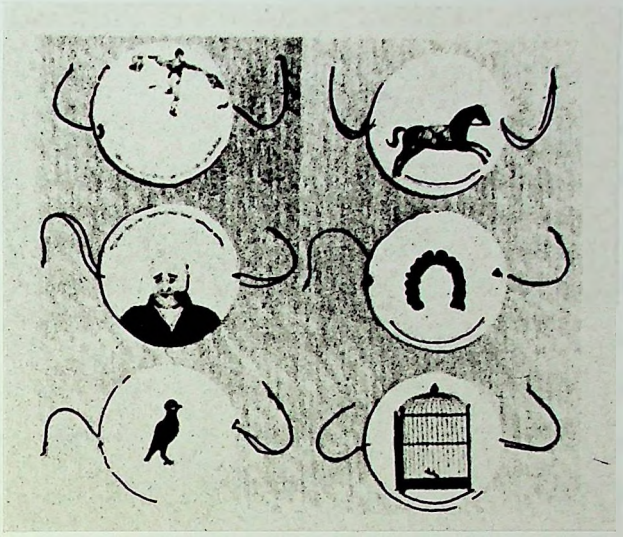
Most of the devices invented by the creators of the nineteenth century were called optical toys. These toys explored and investigated the theory of the 'Persistence of Vision'. The Theory of the Persistence of Vision is based on the idea that the retina retains an image for a short period of time.The motion created by a sequence of images, a reel of film is a consequence of the retina retaining an image.The eye holds the image on each frame only long enough for the next image to move into place. With only the slightest change in each frame being continually received by the eye it appears to the eye that it is receiving a moving image or that the eye cannot distinguish between rapidly repeating images and so it becomes a continued message. The subsequent interest in this theory of the'Persistence of Vision' led to many optical devices being created which contributed research for the first motion pictures.

(ii) THE CREATORS.

The persistence of vision has always been connected with another theory, the theory of Apparent Movement. In 1826an English physician, John Ayrton Paris made the existance of apparent movement known. He was the first creator to attempt to produce a moving picture. This device was called 'the Thaumatrope' (fig.1), it consisted of a single circular card, the centre of the card was attached to a piece of string. A picture was drawn on both sides of the card, for example, a black face on one side and the features of a face on the other. When you rotated the card fast enough, one picture was imposed onto the other and both pictures appeared as one. This happens because of the delayed reaction of the retina. The basis of the idea for the persistence of vision, was demonstrated in Paris's Thaumatrope.The'persistence of vision' can only account for gaps between exposusres of images.

Paris's Thaumatrope was a popular toy among the children of the Victorian era because it was easily made and cost very little, it also gave endless hours of amusement. He had his thaumatrope printed alongside a pun filled novel. This proved so popular that it had to be printed eight times.

As a scientist Paris had created a device that explored a theory. The device had encouraged comment among scientific circles. That it entertained was of minor importance. Though it must have pleased him as susbsequent printing shows, Little did Paris and fellow scientists know what their devices would lead to. As yet their main interest was in science and technology, the commercial

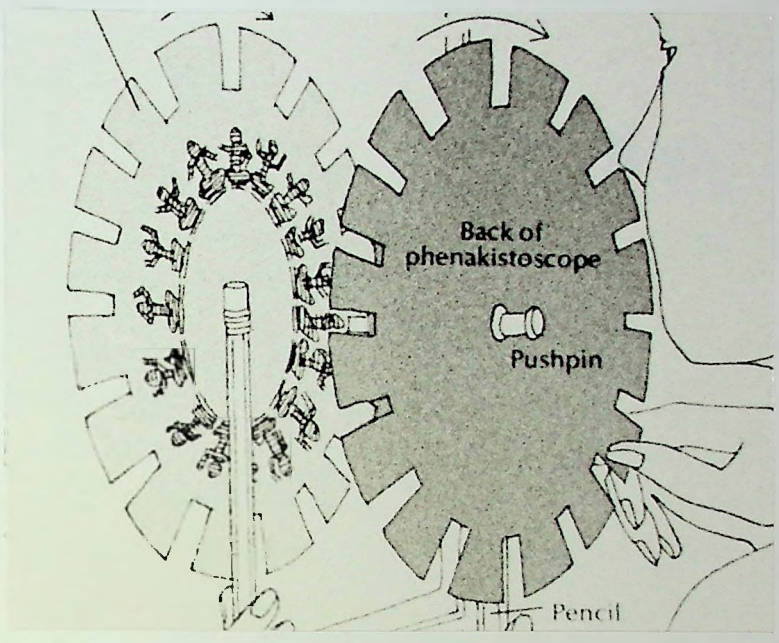


(Fig.1)

viability of their devices had as yet not come into existance. In 1829, three years after Paris had invented the Thaumatrope, Joseph Antoine Plateau, a professor in Brussels and a scientist in the field of optics wrote his doctorial thesis on the 'persistence of vision'. Three years later Plateau developed the Phenakistoscope (fig.2), and in the same year an Austrian geometrician Simon Ritter Von Stampfer invented a similar device called the 'Stroboscope', reports of the Stroboscope appeared in Austrian and European newspapers at the time. The Phenekistoscope and the Stroboscope were models which created the illusion of movement. Among cinematic circles the Phenakistoscope is considered to be one of the most important devices in the prehistory of cinema.

The Phenakistoscope consisted of a disc with slots cut into it. A series of images were drawn around the perimeter of the disc. There were equally spaced appetures around the perimeter. When the disc was rotated on its axis, the images visible through the apperatures were reflected onto a mirror, when you looked at the mirror the images appeared to move. Plateau describes here the idea behind his model;

'If a number of objects differing minimally in form and position are shown successfully to the eye very rapidly and at sufficiently close intervals, the impressions they produce on the retina will coalesce without becoming becoming confused, and you will believe you are looking at a single object changing gradually in form and position' Quoted from, Histoire Generale du Cinema, 1948.



(Fig.2)

Later when early motion pictures were created they added another level of ingenuity to Plateau's principle. In film a series of photographs are projected onto a screen, each photograph is seen for a fraction of a second. Between exposures a shutter driven by a motor inside the projector blocks each photograph from view. This is similar to Plateau's Phenakistascope which had been created many years earlier.

As Plateau was engaging into his explorations in the 'persistence of vision', he often experimented on himself. This proved to be unfortunate for Plateau. In one experiment he is said to have stared at the sun for twenty five minutes and as a result he became blind when he was only twenty eight. After a few months he recovered partial sight but at the age of forty he became permanently blind. His wife helped him continue his work into the 'persistence of vision'until he died at the age of eighty-two. Plateau never patented his creation believing that it should be used to further research into the creation of optical devices. Perhaps this is why the Phenakistoscope is less well known while Stroboscope which Stampfer patented is more commonly heard of. Both the Stroboscope and the Phenakistoscope were created simultaneously by two people who knew nothing of each other. Both of their creations gave the illusion of moving images. But later in 1852 another creation which gave the illustion of relief and movement was invented by a Frenchman Jules Dubosq. He named his creation the Bioscope or Stereofantiscope, he stated that with the mirror-stereoscope he had finally succeeded in constructing a machine that combined the essential qualities of the stereoscope with the wonderful qualities of Josef A.

Plateau's Phenakistoscope. The stereoscope gave the impression of three-dimensionality with its movement of pictures by the action of springs while the Phenakestoscope gave us the illusion of movement. Another Frenchman Henry du Mont in his patent for the 'omniscope' in 1859, a machine which was created to give the illusion of images in relief,said that the Stereofontiscope was created simply for the pleasure of the eyes!

The Stereofantiscope was probably one of the first devices invented to entertain the eye of the observer.

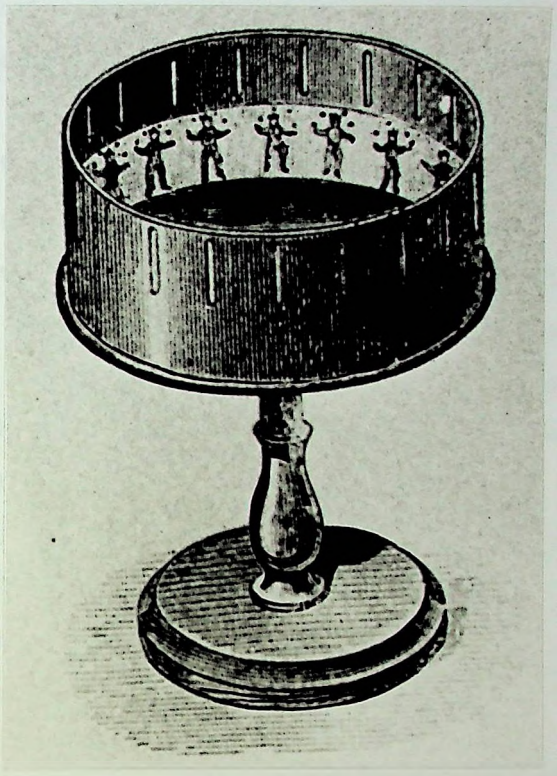
An army private, Franz von Uchatius was the first person to project a series of images onto a wall before an audience using Stampfer's 'Stroboscope' he created the illusion of movement. Von Uchatius used the Stroboscopic discs to illustrate motion to pupils. The discs had to be passed around the class which consumed valuable time. In order to conserve time and speed up the process, Von Uchatius conceived an idea which would display various movements in order for them to be seen by every pupil at the same time. He accomplished this by using a magic lantern to project successive images onto a clear white wall. These images had been painted onto a transparent disc.

The moving images of Von Uchtius were generally popular not only with his pupils but with scientists engaged in the field of optics. It was considered that with instantaneous exposures and photographic serial pictures, his moving images would eventually be improved.

From 1833 to 1850 progress in the motion picture illusion was slow and there were no great developments in designs on the

optics. Meanwhile, Europe was busy with photography stills and in 1851 an Englishman Frederick Scott Archer discovered the wet Collodion process. Collodion is dissolved gun cotten in ether, but it was not until twenty years later that manufacturers began to avail of collodion as commercially prospective. In 1876 Worthsworth Donisthorpe exposed plates for a series of successive images in a Zoetrope (fig.3), a type of magic lantern. Glass discs with images painted on them were used in the Zoetrope. On the glass disc there were shutters which rotated on an axis, for each rotation of the picture disc, the shutters rotated ten times. This allowed a liquid movement to occur, giving the images a more 'fluid' appearance. This device was improved upon by L.S.Beal in his 'choreutoscope'. In the 'choreutoscope'the image disc moved intermittently by a cross mechanism. An image was available each time a revolution occured.

The magic langern had been popular when it emerged twenty years earlier, however, it had disappeared for a number of years and was now making a comeback. The optical lantern consisted of a body usually made of wood generally mahogony or metal. Though mahogony was strong, metal was lighter and therefore had the advantage of being more portable. Also part of the magic lantern was an illuminant, an optical system and a way of holding the slide in the path of the light. Transparancies were projected by an artificial light onto a screen to be viewed by an audience. The diameter of the image could be enlarged from twenty to one hundred and fifty times but generally it was enlarged at twenty to thirty times and often much less. The 1870s saw a mass production of 'magic lanterns'. Slides covered a variety of



(Fig.3)

subjects that affected the social lives of the people at that time as the following quote from G.A. Household and L.M.H. Smith states;

'The stories highlight the social problems of the day, drunkeness,poverty and unemployment'.

The Temperence Movement had started in Maine in America in 1851 and spread. By the 1870's and 1880's it had become highly popular in Europe. The movement was a favourite among the topics of the slides in the magic lanterns. The following quote from "Jessies Last Request" J.J. Lane, shows just how popular;

"A kind lady who came to see us,
a pledge book in her hand?
she pressed us all to sigh, Father and
join a temperance band,
She said that none were safe that who took
the drink in little drops,
It led to drinking more and more
at home and in liquor shops"

The largest slide manufacturer in the 1870's was to be found in Holmfirm, Yorkshire, it was owned by a James Bamford. Those employed at his factory included artists, actors and scriptwriters. Everything worked seasonally. Shooting occured in summer, while winter was spent producing, manufacturing slides, painting and writing scripts. Colours were at first limited to black and white plus a few basic colours. As painters became more skilled at mixing other colours, their palate eventually expanded to create highly colourful visuals.

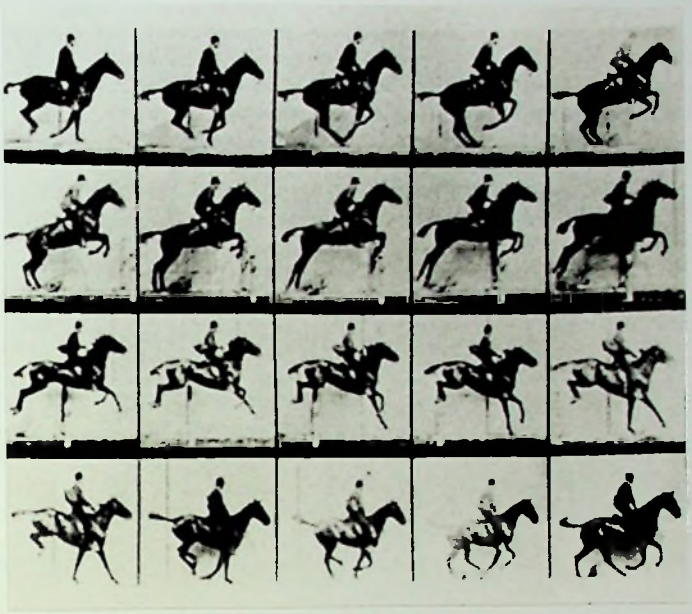
The work of the slide painter was a tedious and time consuming job. They had to work on a piece of glass 3 inch square. They developed great skill which eventually led to the unpopularity of black and white slides with the public. The magic lantern was capable of producing the effects of superimposing, fading and dissolving images. Continuous movement was also possible but only for short periods of time.

Somabody who developed a device which combined the Zoetrope with the magic lantern was a Frenchman by the name of Emil Reynaud. He named his creation the 'Praxinascope', later it was to be called the 'mirror drum'. In the Praxinascope a band of drawings were not directly seen by an audience. They were seen as an image reflected onto a twelve sided mirror drum situated on the side of a cylinder. The Praxinascope needed only one lamp which was enough to light its two way projection system. One lense would project a moving person the other a country background. When both were projected together, the person moved creating an animated image. He also invented a perforated flexible picture strip on which he took out a patent in 1881. Emil Reynaud used his device for pantomines at the 'Theatre Optique' in Paris 1892 and 1896. He continued his work by making improvements to the stroboscope, using the stroboscope to present the images to the spectator and using the praxinascope to project the image.

As I mentioned earlier, the theory of the 'Persistence of Vision' was associated with the notion of Apparent Movement. There was a fascination with movement in the nineteenth century and the experiments and uses to which movement was explored could not have been more vast. An American, A.B. Brown, was the first

person documented to invent a device containing a rapidly changing exposure interupted by a rotating shutter, the picture plate being simultaneously interrupted. Browns creation corresponds with that of the modern motion picture. Qualities in the device were similar to the contemporary motion picture device. Brown also completed some work on the apparent velocity of actually moving objects, but I will discuss this in Chapter Two.

The interest in still photography in the 1830's to 1850's developed with the ninteenth century exploration into motion. The interest in motion led to experiments in rapid photography. An English photographer, by the name of Edweard Muybridge was working for a United States Government agency when he was hired in April 1874 by Leland Stanford. Stanford and a colleague James R.Keene had debated over whether a horse at any point while running has all four legs in the air, Leland bet Keene £25,000 that at one moment during a stride, all four feet of a trotting horse were off the ground. Muybridge was hired to prove Leland right and win him his bet. The horse that was to be used on the experiments was named 'Occident'. Muybridge began by setting up a series of trip wires around a track. As the horse ran it would trip each wire which in turn triggered a series of cameras that ran parallel with the wire. Occident was photographed in April 1873 and the results proved to be very successful (fig.4) and Stanford was so impressed that he decided to sponsor Muybridge in further research using the photographs. Muybridge went on to have a motion photograph painting of occident published on August 11th



(Fig.4)

1877, almost exactly two years later a book of photographs on human motion was published (fig.5).

The glass plates Muybridge had used were treated with collodion, then coated with potassium iodide, and finally sensitised with silver nitrate. A few years later he substituted the glass plates for gelatine-bromide dry plates. He also developed an apparatus to project his photographs. The photographs were placed around the perimeter of a disc which was rotated by a handle. As each slide was momentarily passed through the front of the lens, light from a projectional lantern was passed through each slide. The image was provided on a large screen. He called his invention the 'zoogyroscope' then the 'zoopraxiscope'.

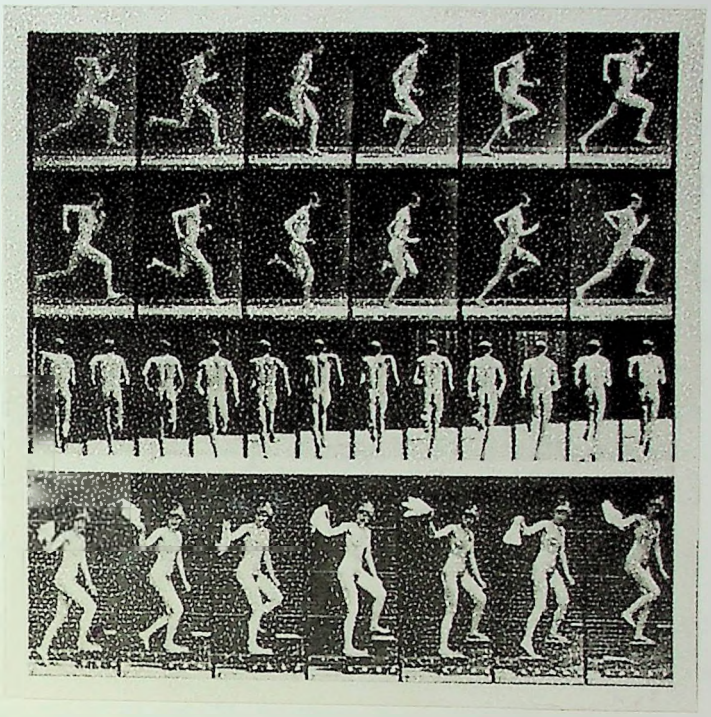
The earliest documented exhibition of Muybridge's 'zoopraxiscope' happened in 1879, probably at the home of Leland Stanford in California.

Muybridge's audience were amazed at their entertainment and were probably the first people to witness the official beginning of the motion picture in America.

In 1880, a Californian newspaper, the 'Daily Alta California' dated May 5th, published the following;

"Mr.Muybridge has laid the foundation of a new method of entertaining the people and we predict that his instantaneous photographic magic-lantern zoetrope will make the round of the civilized world".

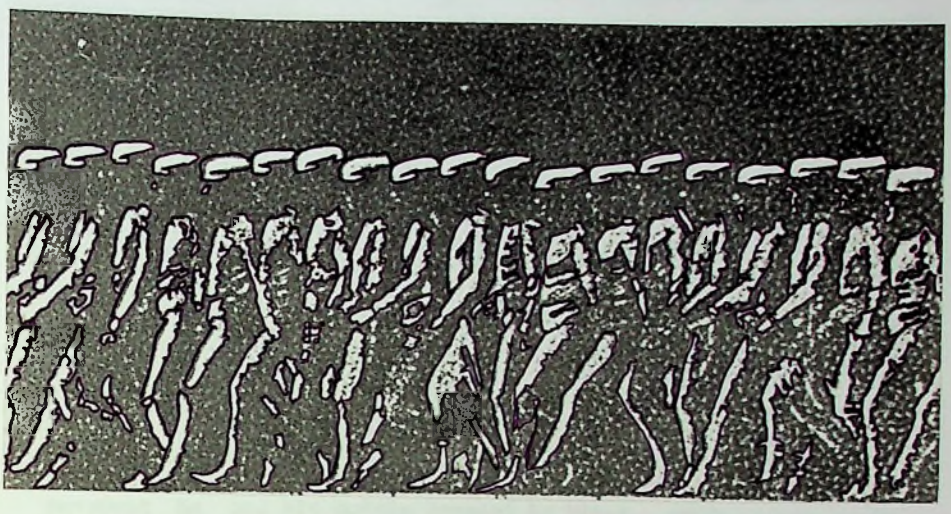
In August 1881, Muybridge travelled to Europe where he exhibited his rapid photographs of moving horses and scientific studies of



(Fig.5)

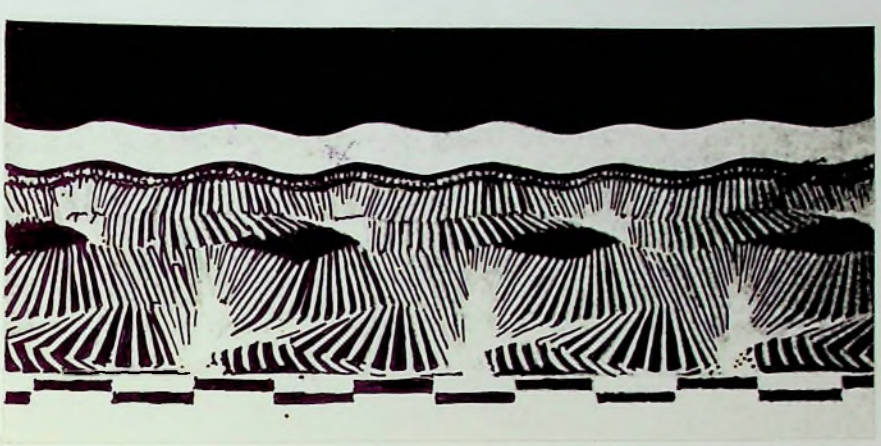
motion. The Zoopraxiscope was also demonstrated before the audience. During a visit to Paris Muybridge met french Physiologist E.J. Marey. Marey was analysing the study of movement in humans (fig.7) and animals. He had created a photographic gun based on the same idea as the colt automatic revolver, the gun contained a mechanism which rapidly moved each photographic plate into position once a previous shot had been taken. Photographs were then taken at a very fast pace. Marey later went on to invent chronophotography. Chronophotography was a single photographic plate whoch could record continuous stages of movement.

Marey was trying to find a quicker way to record the "Trajectory and Osailatory" patterns of movement. He had been using methods similar to Muybridge but found these methods were not suitable for spontaneous movement. While trying to photograph a flock of birds, Marey found that their unpredictable movements could not be depended on to release a wire and subsequently cause a photograph to be taken. Some years earlier in 1874 a colleague of Mareys, Jules Janssen had developed a mechanism to record the planet Venus crossing the Sun. The mechanism was also a photographic revolver and inside the gun there consisted a revolving disc which took photographs every seventy seconds. Janssen contrasts his photographic revolver with Plateau's Phenakistoscope. "It is designed to reproduce the illusion of movement by means of a series of elements that comprise the movement, on the other hand, the photographic revolver provides the analysis of a phenomenon by reproducing the series of its



(Fig.7)

basic component elements'. Marey went on to increase upon Janssens photographs of one every seventy seconds and in 1887 he began using roll film. He was then able to increase this rate to one hundred photographs per second. Marey's camera contained moving film and it was portable and was perhaps the first cine-camera.
At this stage Marey now felt he could develop his skills further. Already he had explored methods created by Muybridge and fellow previous inventors. In order for him to further his research, he would have to branch away from the traditional boundaries of photography, beginning with his interest in motion. To emphasise movement he had his models dressed in black, certain parts of their bodies were painted white. Then he would have them placed against a black background. When the models moved, the white areas helped to make the motion "more apparent"(fig.6)
"Having established meticulously the pivotal points of the movements of the different joints, you stick on each of them a small shape of white paper, a circle here, a triangle there, a square, a cross etc. When the animal is made to pass in front of the dark background, the photographic plate shows up an infinite number of little signs scattered in odd patterns. An enlargement of that image is projected onto a sheet of paper, and you note the repeats, because every fifth repetition of the given sign will stand out more clearly. Than you draw a line, lining up the signs of the same image and you obtain a figure...which charts the different positions of the limbs of the body".
Quoted in Deliandes, Histoire Comparee du Cinema, pg.127.
The objective of Marey's experiments was not to illustrate how clearly the images portrayed movement, he saw a failure in the



(Fig.6)

images impersonating sight. With the photographs he hoped that whoever saw these images of motion would become aware of the failure and therefore would be able to correct it. Marey goes on to explain.

"But in the end, what images show could have been perceived with the naked eye. They add nothing to the power of our sight, they in no way diminish our illusions. Whereas the true nature of scientific method is to remedy the insufficiency of our scenes and to correct their errors. In order to achieve this, chronophotography must stop trying to reproduce the phenomenon as we see them"

Quoted from Sadoul Histoire Generale.

Marey felt that human sight was already functioning perfectly well without chronophotography. If chronophotography or any other scientific method used in the production of image was to be of any benefit, it would be as an aid to any malfunctioning part of the human senses.

On February 1894 Edweard Muybridge received a letter from Thomas Edison. The letter reads as follows:

"I have constructed a little instrument which I call a 'Kinetograph' with a nickle slot attachment and some twenty-five have been made out. I am very doubtful if there is any commercial feature in it and fear that they will not earn their cost".

Thomas Edison had modelled his Kinetograph on the phonograph. Kinetograph and the Kinetoscope both work on the same principles as the machines developed by Muybridge and Marey. The Kinetograph, a moving picture camera and the Kintoscope, a

peep show viewing machine. Both of which were created at Edison's research laboratory by a W.K.L. Dickson. Edison said that the inventions were created "purely for a desire to record moving images to accompany the recorded sounds of his newly invented phonograph".

When I first turned my mind to the subject in 1887
it was with the thought of creating a new art
I was not interested in analysing motion because
that had been done with brilliant success by
Muybridge and Marey before me, just as with
the Phonograph, which makes a permanent record
of an indefinite number of sounds, I wanted to make
a permanent record of an indefinite number of
successive phases of movement, doing for the eye
what the phonograph has done for the ear".

Quoted in F.H. Richardson,'What Happened In the Beginning' in Raymond Fielding 'A Technological History of Motion Pictures and Television 1967 pg.22.

The film was an essential feature itself. It was a necessary item in the kinetoscope and the kinetograph. The main ingredient of film was celluloid which was strong and flexible. Celluloid is a derivative of cellulose and was invented in 1861 by Alexander Parkes. The film was perforated and it could easily be passed through the mechanisms of the Kinetoscope and the Kinetograph by a sprocket.

An English photographer by the name of John Carbutt was the first to supply the film which was originally in thin sheet form. When roll film arrived, George Eastman became the main provider

particularly when the film was made specifically for the kinetscope, and the films that were made for it were being commercially produced and exploited.

The commercial potential of the Kinetoscope was recognised by A.O.Tate, Thomas Lombard and Erastus Benson. They were granted permission to open a Kinetoscope Parlour on April 14th, 1894.

The priority of inventors was no longer the scientific understanding of images and movement, the urgency of creating had become their new objective. While this change was occuring each inventor with his own aim, another discovery was taking place, that of a change of attitute. People were becoming visually aware with society becoming saturated with optical toys, gadgets and machines. All that had been invented had become a part of the routine of vision that dominated Europe and America in the industrial era. Materialism increased among the Europeans of the 19th century. They had seen scientists uncovering the wonders of radio waves and electricity. They knew that it was possible to send messages at the speed of light. Europeans believed that before long and through the understanding of science, man would know and understand all. With the improvements in medicine and prevention of disease, people began living longer, housing and working conditions improved and the lifestyle of society improved. Europeans looked forward to the twentieth century when the world would be so perfect that nothing could possibly compare,not even heaven.

In all the experiments that were devised in the 19th century, images were given movement. The images were restored to life with

the willing hand of the creator. These images had become reality to the eye. Moving photographs was one of the great achievements of the nineteenth century and in a report dated 29th November 1881:

"Imagine with the telephone you can already preserve the human voice in a box, just like sweets, with a series of animated photographs you will be able, years later, to rediscover the way a man moves or holds his head. The ghost will walk, that is how little by little science, progressing with giant steps,will succeed in abolishing death, it's sole obstacle and only enemy". Quoted in Desandes, Histoire Comparee du Cinema (pg.101).

Rapid photography was one of the most important contributors to the birth of cinema. By late 1880's Europe and America were ready for cinema.

In France a successful photographer by the name of Antoine Lumiere had along with his son Louis invented a type of photographic plate which was highly successful and so in great demand. The Lumiere family prospered. Antoine recognised how commercially valuable the Kinetoscope could be. But, was a little worried at the money Thomas Edison ws making on the sale of film so he asked his son Louis to create something similar. Louis came us with something better and invented both a camera and a projector. He said that his device was influenced by the work of Marey and Janssen.

Louis Lumiere's device was said to be more successful because he paid so much attention to detail when fifty years later the camera was opened by George Sadoul, he said it still functioned perfectly. Louis's brother Auguste said;

"My brother invented the cinema in one night a night in which Louis were suffering from disturbing dreams and a migraine"

Throughout 1895, the Lumiere gave semi private viewings. At the end of 1895 on the 28th December the Lumieres opened a public auditorium in Paris. The location was at the basement of the Grand Cafe on the boulevard des Capucines. It was the first time that an apparatus had created a form, a representation, something that entertained. Most machines up until now had in some way been inspired by the kinetography ans the kinetoscope. With the arrival of cinema came a reality of life across the varied societies of late 19th century civilization. This reality was obvious not only in the film but in the technology. It had taken a varied cross-section of Europeans and Americans to eventually bring about the creation of cinema, what had begun as theory. 'The Persistence of Vision' had developed into a medium of communication, an entertainer for the audience to feast their eyes upon.

CHAPTER TWO

PERCEPTUAL THEORIES

CHAPTER TWO

PERCEPTUAL THEORIES.

Nothing on the cinema screen really moves. What we see is a series of still images in rapid succession. The cinematic version of motion that appears on screen cannot be distinguished from movement in reality. From the observers point of view, movement is movement, it is difficult to differenciate between real movement and apparent movement.

Brown, whom I mentioned in Chapter One, found that the apparent velocity of a moving object depends on a number of factors. Number one, the size of the object and, number two, the size of the surrounding area. If for example the size of the object and its surrounding area is doubled, then the apparent velocity is halved. Increased light in the surrounding area will also decrease the apparent velocity of the moving object. For example, if you drive during the night and during the day at the same speed, you usually assume you are travelling faster at night. As the theory of the 'Persistence of Vision' has already been associated with the idea of apparent motion, I will now go on to discuss the role of perception, apparent movement and the threshold of perception have always been connected and created by film.

There is an experiment called the Phi-Phenomenon in which two lights are placed next to one another flash alternatively. This is a basic exercise in which we are shown how apparent movement can be reduced to two events. First one appears, then the other, their combined appearance encourages the impression of movement.

The speed at which the lights flash increases until it is no longer within the perceptual threshold of the observer. At this time it has become a single light rapidly alternating between two points. A number of points will determine the success of this experiment like the brightness of the images, and their form. These factors determine if movement will actually be perceived by the observer. There is a connection called a 'perceptual threshold of duration' - that, is the length of time a stimulis must last in order for it to be perceived. We see movement because the duration of each gap is not long enough for us to perceive,in other words the gaps, they do not cross the perceptual threshold of duration.

Because the eyes are separated by a distance of about 2.5 inches the images formed on the two retinas of those two eyes will slightly vary from each other. This is described as retinal disparity. A perceptual exercise illustrates that to see apparent movement work you should hold your finger about two feet in front of your eyes, meanwhile look at some object in the distance. Then quickly blink one eye, the the other, also paying attention to your finger. You will then see that your finger appears to move from side to side. The successive images have been integrated to run into a flowing sequence of movement, instead of being seen as independent, alternating events. Once the image is formed on the retina, its effects persist momentarily after the image is removed, and the gaps when you blinked between exposure are interupted by the tendency of vision to persist.

In an analysis of apparent movement the psychologist Wertheimer wrote a general thesis in 1912 on the Phi-Phenomenon. The Thesis was called the 'Isomorphism' and in it Wertheimer explained that there is always a similarity of structure between the phenomenon as seen, that is, the image and the subsequent transmission to the cortex. It appears that the light spots act as a stimuli to our eyes. Wertheimer states that this leads us to believe that perception is a mere sensation.

Wertheimer's thesis was generally believed among psychologists to be the beginning of Gestalt Psychology. In Gestalt Theory there is no distinction between sensation and perception. For an audience to see something in a certain way, they have to distinguish between sensation and perception. To sense something does not automatically mean we perceive it. The phi-phenomenon is a natural occurance, though it must be under certain conditions and the reasons for these conditions determine the action of the sequence which extends from stimulation, through brain transmissions to final perception.

In a cinema, the audience is stimulated by what it sees on the screen. how they perceive this simulation depends upon the content of their observation. But, do we all see the same? Is one persons perception of an image the same as the next persons? How do we imagine an image?

Our view of awareness leads us to believe that we are not aware of mental pictures.

Introspection convinces us that our consciousness is filled with a variety of strange and unusual objects and feelings. Paintings and photographs are our finest images and if perhaps mental

images are not exactly like them then are there elements in perception that exactly resemble what they represent and are they images? We must think of how the images work and as we will see later in narrative how they can be made to work. We will see how isolated incidents shot in distant locations can be linked together by the imaginings of one person; the editor. It is one thing to be an image and another to function as an image. For the image to exist, someone must see it. It must be observed. What is strange is that although an image is given,no provision has been made for anyone to see the image. For example,the interest in the optics in the 19th century, intrigued people in images, how we saw them and how they moved! But before the inventors created the early devices no provision had been made to enable us to see the image. If the image is to work in perception, it will work as an ingredient and not end result. If we assume that the type of perception at work is an image, we would have to create something similar to a perceiver to sit in front of the image and another to sit in front of the previous image and perceiver and so on. Mental imagery has long been a topic of research in psychology, scientists involved in brain research have found no images on the brain to solve the explanations of observation. Scientists do not believe that people can literally see and then manipulate real internal pictures. From experiments on imagery and introspection there are reasons to believe in internal pictures, two subsequent groups have stated their views. The pictoralist agree that we do not literally have pictures on our brains, but they insist that our mental images represents in almost the same way as pictures represent, and the discriptionalist believe that we should have

mental images as representing in the manner of some nonimaginistic representations, for instance, language instead of pictures. Picturing is different from describing, if you picture an image you have to go into detail, in describing however, you do not have to account for the details if you do not want to, you can be non-commital, for example, in pictorial representation, we can show a baby with no pram, we can agree not to know if the baby has or has not got a pram. Then in discriptionalist representation, we do not have to discuss it, we can lie and say, the baby was a dog.

Imagining is like describing rather that picturing, we usually imaging something without going into a great deal of detail about it. This does not mean that we have not imagined details, it just means that the details were not mentioned. The statement 'the minds eye' might bear some relevancy here. Commonsense convinces us that the 'minds eye' is a sixth sense, an addition to the physical events in our sense organs. The last image in the physical process of perception is the image of stimulation on the retina. The process of analysing the image begins on the surface of the retina and travels up the optic nerve so that the pattern of stimulation on the retina is 'lost' and replaced with information about the characteristic pattern of the image and then about the characteristics in the environment. The nervous system transmits the picture of stimulation on the retina deep into the brain and then rebuilds the image there. Further consideration should convince us that all mental imagery is descriptional. If we think about cinema and films and

particularly film versions of books. The film version goes into immence detail and in some way the film version cannot possibly be exactly the same as the author's words, since the picture that the author paints has gone into as much detail as the film cannot help but go into. In most cases the words of the author are incredibly vivid. What we are aware of when we perceive something is more like the written words than the film. When we observe something in the cinema, we are not aware of every spot or hair at first, but rather of the hi-lights of the film. The high points of interest are the parts of the film that stimulate our memories and enable us to react.

There are many other types of pictorial represention that are different from film. These differ from one to the next in the exent to which they involve conventions. When we are comparing Matchstick Men and Photographs, our mental images must represent as a photograph rather than a stick man or any other pictures that are non-photographic. We can wonder if the mental representations that are involved in imagery are the same or even similar to the mental representations involved in perception? People often confuse imagining with perceiving. Both imagery and perception share the same physiological machinery. Images are flat, static and mean nothing while visual perception reveals a solid, moving meaningful world. Perception goes beyond the information present in the image. The 19th century led to the experimental analysis of perception. By investigating elementary sensations it was hoped that eventually the thoughts of the human mind would be discovered, it was thought that all ideas must originate through sensory experience. We would never have an idea

unless we had felt it in our lives. Helmholtz whom I mentioned earlier also discussed the idea that perception was formed through sensations.

"Such objects are always imagined as being present in the field of vision as would have to be there in order to produce the same impression on the nervous mechanism. The psychic activities that lead us to infer that there in front of us at a certain place there is a certain object of a certain charactor, are generally not conscious activities, but unconscious ones. In their result they are equivalent to a conclusion...Hemholtz, 1866, trans 1925 pp2-4). Toward the end of the 19th century, the content of perception was commonly studied by the analysis of introspective. The perception of seeing and seeing as. What you see when you see a thing depends upon what the thing you see is. But what you see the thing as depends upon what you know about what you are seeing" (Fodor and Pylyshyn).

Images are not always as they appear or are they! This assumption is associated with the threshold of vision and phi-phenomenon. What we know about what we see in the phi-phenomenon changes what we originally perceived when we have discovered that what we are seeing is not a continuous light but two isolated alternating lights. An example is given on 'seeing and seeing as'.

"Here is Smith at sea on a foggy evening and as lost as ever can be. Suddenly the skies clear, and Smith sees the pole star. What happens next? In particular, what are the consequences of what Smith perceives for what he comes to believe and do? That depends upon what he sees the pole star as. If, for instance, he sees the pole star that is at the celestal North Pole.

Then Smith will know to that extent, where he is, and he may confidently expect that he will cry "Saved" and make for land. However, if he sees the pole star, but takes it to be a firefly or just takes it to be Alpha Centauri, or - knowing no astronomy at all - takes it to be just some star or other, then seeing the pole star may have no particular consequences for his behaviour, or his further cognitive states. Smith who will be just as lost after he sees it as he was before. (Fodor & Pylyshyn, 1981,p 189).

Helmholtz also drew up this statment in the 19th century considering colour in images and what colours does an object actually have. An object has as many colours as there are different ways to look at it. Again the conditions effect how we see something.

"There is no sense in asking whether Vermillion as we see it is really red, or whether this is simply an illusion of the senses This sensation of red is the normal reaction of normally formed eyes to light reflected from vermillion. A person who is red-blind will see vermillion as black or as dark grey/yellow. This too is the correct reaction for an eye formed differently from that of other persons. In itself the one sensation is not more correct and not more false than the other, although, those who call this substance red are in the large majority. In general, the red colour of vermillion exists merely in so far as there are eyes which are constructed like those of most people. Persons who are red-blind have just as much right to consider that a characteristic property of vermillion is that of being black". -Helmholtz, Treatise on Physiological Optics (1866)-.

We each have the ability to see and how we view something depends on our environment and our genetic make-up. No two people will see the same image exactly the same way. If how we see an image differs greatly from the next person then we must realise that the colour exists as long as we have eyes to see it. Images are directed toward the observer, the observer is equipped with ideas and is ready to draw conclusions about what they have seen. This is the perogative of the human being. This idea of images being directed toward the spectator leads me into my final chapter on Narrative.

C H A P T E R T H R E E

N A R R A T I V E

CHAPTER THREE.

NARRATIVE.

Moving images, pictures, tell us a story and the study of films from early this century allows us to discover how film narrative began and evolved. Some early film-makers followed a pattern. Usually they would concentrate on shots, dialogue or charactors. Once we can see and understand the variety of patterns in narrative then we can recognize origins of narrative. The first films around 1895-1910 used a formal narrative similar to that which was used in medieval literature. In doing this they were developing a pattern by providing materials - particularly expressive ones structured in a certain way to tell a story. The quality and the character of early film narrativity varies.

A characteristic of the early narrative form is its ability to imitate subject matter within a pattern consistent with reality, leaving out anything that may interupt the narrative flow. Such a form evolved in 1910. For the observer the level of narrative fluidity is an esential ingredient because it is this ingredient which will prove basic for the ensuing decade. Narrative fluidity serves as a necessary condition for the development of cinema narrative. In the very early films there was an absence of such flow. Then in a film made in 1895 by Louis Lumiere problems were avoided in narrative fluidity because he staged all his action within a short continuous camera run. The film was shot by the cameras isolating single continuous movements. This gave the film a simplicity that appealed to the audience. Inventors of the motion picture camera were the first to invent his shot and so began the era of the one-shot film.

Early film-makers considered the shot as a single separate unit relying totally on itself. They tended to think of the isolated shot as complete. The objective of the shot was not to show a small segment of the action but present the whole action unfolding in its own space. The point from where the action is seen must be stable - it was very important that this point took precedence over editing.

Narrative was stumbled on by accident by George Melies, a director and producer and the first person to open a public theatre in Paris. He set up the Star Film Company in 1897 and shot all his films omnibus in his studio in the Paris suburb of Montreuil.

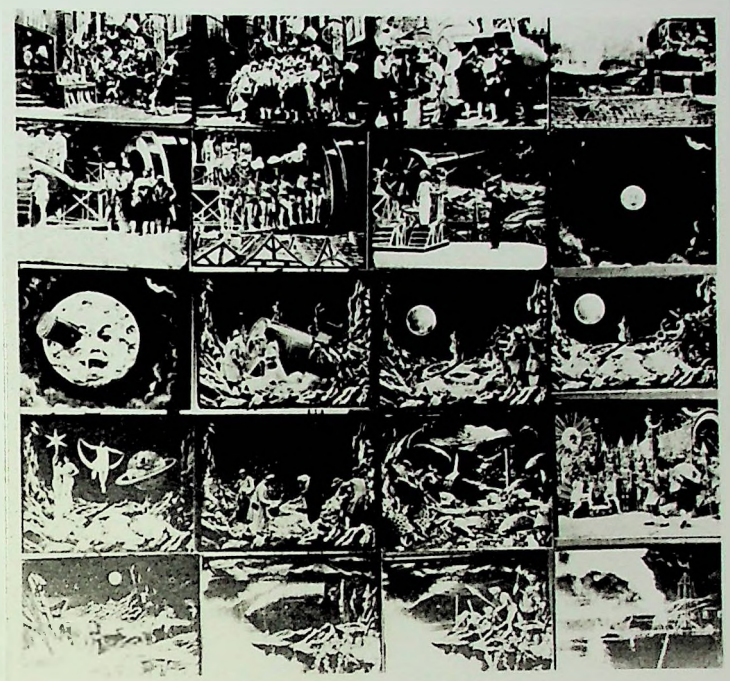
While filming an amnibus emerging from a tunnel, his camera jammed. As he fixed the camera a funeral hearse took the place of the omnibus and it appeared that one had transformed the other. With this came the realization that time and space could be adapted to suit the observers needs. Predecessors to Melies assumed that film just repeated reality. However, film is a separate unit with the ability to manipulate time and space through editing. Melies had originally been a magician and spent a great deal of time on stage consequently his films were conducted as though he were directing a play for theatre. The scenes were filmed on a one-shot action on a motionless camera. The camera was always fixed at a certain spot in the audience imitating the observers fixed point of view. Although his camera functioned as the sight of the theatre observer, within such a one-shot system, there was no danger of unmatched cuts or

temporal overlap. Temporal overlap was the repitition of part of an action that finished the previous shot. It was used to describe a single continuous action. It may disrupt the observers sense of the continuity because of the repetition. The repeating action is felt as a kind of jump, vaguely shadowing the temporal fluidity. While trying to match one single shot and a closer view of a single action, part or full repetition often occured.

For example, in a 1904 film by Edison called 'The Strenuous Life' there is an analysis of space of the single shot. A newborn baby is held up by his father who puts him on a scale and imitates his happiness. The second shot keeps the same visual axis but poses it closer while the same shots are repeated.

When you begin taking more than one shot Juxtaposing them from different angles, problems always present themselves. For example, the problem of space and time. Two successive shots have the ability to select either two different points of view toward a single space or two separate spaces. The film makers knew how to move and manipulate the objects in the frame. Movement was made possible by new inventions which could stop, enlarge and reproduce movements of people and objects.Early films used temporal overlaps to try to solve the problem of adjoining space. For example, in the 1902 film 'Le Voyage dans la Lune' a Star film by Melies (fig.8), in one shot a rocket is seen heading through space. It hits the eye of the moon, the second shot is seen from on the moons surface when we see the rocket arriving and again hitting the eye of the moon.

Film-makers usually have action repeated through editing in order to involve actors displaced in two adjacent spaces.



(Fig.8)

Edwin S. Porter, the American director gave us an example of temporal overlap in 'The Life of An American Fireman' (1903) The film was originally based on late 19th century narrative lantern slide sequences. Fire was a very popular subject in the early screen. Let me just describe the editing of the film. First the audience was shown the inside of a burning house. We see a brave fireman risking his life to save a woman and her child. Both the woman and the child in her arms are so overcome by smoke that they fall onto a bed. A fireman then enters the room by breaking the door. He goes straight to the window and orders a ladder,he then flings the woman over his shoulder and climbs out the window. A moment later the fireman re-appears at the window, he climbs in and rescues the child, then exits. Two other firemen then enter through the window. They begin to put the fire out. The shot cuts to black. The film does not end here. Porter stated that had it finished the audience would have missed it's climax,when the woman had reached the ground with the fireman she had pleaded with him to return to the house and rescue her child who was trapped in the room. Porter said that he added the last shot to show the woman's request. This shot lasts as long as the previously run shot. It allows us to see once again the very same action only this time the action is seen through the exterior of the building.

From our point of view, being the observers, our perceptional analysis of the film convinces us that the presence of two different points of view toward a single image, that is, the camera directed at a certain event justifies there continuous

appearance. the continuity creates a repetition of the action and eventually a 'temporal overlap'.

Another point of view is observed in the last shot of the film. Again it is the same action as I have already described and this time the sequence is shot in a original and inconsistent fashion. This is an unusually long sequence. Most examples that are known follow the pattern I am about to describe. Again in 'The Life of An American Fireman', it's the third shot, the firemen are in their beds when the alarm is sounded. Each fireman jumps from his bed and slides down the pole to the ground floor. One by one they disappear. Then in the fourth shot, we see each fireman descending to the ground. This is an example of temporal overlap. Another example is seen when the firetrucks have already left, driving toward the camera, then in the next shot we are inside the firehouse and the doors are about to be opened, once the doors are opened, the fire engines begin to leave once again. There is a solution to this temporal overlap suggested by Eric Rhode in the History of Cinema. He suggests a way to successfully join the two shots. Beginning with the third shot, the editor could have cut when the last fireman decends through the hole in the floor, the next shot would then begin with the last fireman about to slide down the pole. The Museum of Modern Art Department of film has always considered that Porter's film with its illusion of separate but simultaneous and parallel actions was the basic structural element of cinematic narrative. Porter used staged scenes combined with footage he found in the Edison archives to produce his unique and newly discovered

cinematic form. In the following quote we see how he went about filming the scenes of a dramatic rescue from a burning building: From the Network News, dated November 15th 1902, "To save a woman and put out fire"

"And while East Orange Firemen perform, Kinetoscope (sic) machine will record scene. There will be a fire on Rhode Island Avenue, East Orange, this afternoon, or at least the East Orange Firemen will be called out and go through the motions of extinguishisng a fire and rescuing a woman from the upper storey of a house for the benefit of the Edison Kinetoscope Company, which will have one of its chain-lighting cameras there to reproduce the scene" (Musser, p.28)

There is another version of the film. The editor of this film wishes to remain anonymous. In this version the shots are edited to pass from exterior to interior. There is no repeditive shooting of scenes. The unknown editor has adopted a technique which is a solution and in doing so he avoids overlapping. He added the solution of 'parallel editing'. Parallel editing was not really used at that time. It did not become popular until 'continuity film' makers like D.W. Griffith came along.

Early examples of parallel editing deal with adjacent spaces not distant ones. Usually expressed in an abstract way rather than linking continuous action. Consider this scene - An old man begs in the street trying to raise money for a wheelchair for his crippled Grandson. Then the shot is cut to show the young grandson struggling to crawl across the stone floor of the kitchen. The parallel editing focuses on the tragedy of the situation and the old man's thoughts while pulling at the heart strings of the

audience.

The technique of parallel editing or cross cutting as it was also called was used to reveal simultaneous action. The first earliest known appearance of cross-cutting between parrallel and simultaneous actions was seen in 'Her First Adventure' (1908). Directed by Wallace McCutcheon for American Mutoscope and Biograph. In the film, the audience watches a flight if kidnappers and a faithful dog in search of a stolen child.

Often early film-makers would show the relation between two spaces by 'panning' the camera from one area to another when the space that was to be covered was large. There are limits to this procedure however. Often the relation of spaces in alternate shots is shown simultaneously by parallel editing. A director by the name of Black used parallel editing in his directing because he decided that he wanted to exploit the possibilities of showing a filmed 'real world' that broke the boundaries with the aid of a portable camera. The portable camera was another option available to film-makers at this time. Edwin S. Porter used it later in his direction of the 'Mill Girl'. Black decided that in order for him to display action he would have to show the seconds before and after the action came. In this way a violent scene might show a villan reaching for a knife in one scene and the next scene would reveal the victim laying dead or injured on the ground or perhaps one shot showing a woman hanging on for dear life to the edge of a cliff the next shot shows her battered body on the rocks. This rapid juxtaposition, while essentially an aspect

of what is referred to today as 'continuity editing' increased the illusion of successive movement. When it was first seen the audience thought that the technique enhanced the rapid action flow of the narrative. The story appeared so natural that it was more realistic.

D.W. Griffith did popularize the technique of cross-cutting between parallel actions and this can be seen in his early films,for example, 'Drive for a Life' (1909). At that same time cross-cutting was referred to as 'flash-back' or 'cut-back'. It was Griffiths extensive use of cross-cutting that allowed him to do without the use of cutting on action, and matching cuts as a means of creating movement in film.

Later film history provides only rare exceptions to the visual elimination of action overlap. For example in the battleship 'Potempkin' by Eisenstein in 1925 (fig.9), the sequence shot at the odessa steps repeats actions through editing. The two-hundred steps would have taken less time to descend. But through editing the shot singles out individual incidents of terror, one such scene depicts a woman's face in horror as her baby in his pram rumbles out of control down the steps, amist screaming people, maimed and dead bodies. The actions in the sequence on the Odessa steps were shot repeatedly over a period of seven days, it took two days to edit. Once two shots were filmed and the decision was made to connect them in such a way as not to disturb the surrounding space. It was always a great achievement for editors to match two shots which were completed in two very different places probably miles apart. Exterior on location and interior completed in the studio could be joined by editing. Also

(Fig.9)

the shots were not just distant areas but two different spaces, completely isolated. A match without overlap can be seen in the 'firebug'. There is a scene where the father is struggling with an arsonist, the camera shot cuts in to continue our view of the fight by moving to long, to medium, to long shot. By cutting and linking between shots depicting actions filmed from various angles the film-makers began to see action unfolding on screen as similar if not equal to the continuous flow of action they had filmed. The changing of angles gives the audience an improved image of continuous action. It is a form of live television where programmes are recorded by a number of cameras that simultaneoously record an action while somebody who acts under the directors supervision chooses which camera will be on air. There is no danger of disturbing the action because this is all continuous, however, in the cinema if the director has filmed something in long shot, he may need to repeat it in closer view. The problem arises in this situation when the editor has to match the position, time, speed, when rejoining separate segments.

In 1907 fiction had taken the place of reality. Reality had had precedence in the first decade of the cinema. Most of the films of 1907 were not complex narratives. The majority were comedies. Most of the films had at that time a loose structure and could be shortened or extended without changing the content too much. Some films might start with a fascinating narrative but would go on to a chase. Chase films were made up of repeated shots and could easily be lengthened or shortened without changing their content. The chase film consisted almost of diagonal movements from the

distance to the exit at either side of the frame. This movement would be repeated in each following shot, from the distance to the foreground. Once in a while for the sake of variety the movement would be reversed. The character would enter the frame in the foreground and run into the distance. These shots took time allowing characters to run all the way through a shot. To satisfy the audience desire for excitement, the director would involve as much action as possible. Trains, trucks, cars, bicycles, horses, dogs and people would all create havoc.

As the action speeded up, the shots became shorter and the joining more controlled. the public wanted and loved continuous action. Every inch of the story must hold their interest. The audience wanted a consistent plot. Most popular films ran from fifteen to twenty minutes and were from five hundred to eight hundred feet long.

In early film narrators and titles usually preceeded the film. Between 1907-8 an interlude became popular. Talking picture actors would gather to speak their lines from behind the scenes. Methods of recording were tried but never seemed to be satisfactory. In 1907 film-makers began to take a more creative interest in their films. They were trying to find ways to include the audience in the narrative by the way it was structured. Only very few films that survived from 1907 even tried to meet the problems of integrated narrative. An example of this is a film called 'The Mill Girl' it was produced by the Vitagraph Company and was copyrighted on September 17 1907 and was directed by Edwin S. Porter. The sequence took thirty one shots. The film was typical of that era. There was a lot of emotion and plenty of

action and suspence. The whole concept was entirely meladramatic. The storyline is as follows: a girl who works in a mill is having to suffer the advances her boss is making toward her. There is a young man in the mill whom she loves and he comes to her rescue by knocking the boss to the ground only to be set upon by two thugs her boss has employed. He defeats the thugs on two occasions but then he loses his job. Once again the employer makes advances toward the young girl but fire stops his actions and brings about his death. The girl is rescued by her young man.

With films like the 'Mill Girl' it was always difficult to tell where shots ended and began and where they were joined. For narrative at this point it was important that the shots articulated the story.

One of the earliest film critics was a person by the name of Vaclav Tille from Prague. He described this problem in 1908 when he stated often film-makers who continued an action from one location to another 'without succeeding in linking together all the moments of a moving scene'. A survey of the first film reviews published by the New York Dramatic Mirror (1908) critisises film for its poor construction, 'a very good theme and a story of real heart interest is spoiled on this film of faulty construction'. The New York Dramatic Mirror also states in a complaint against film-makers for their failure to clarify their films, 'we have hitherto noted a failing of certain Edison films that they lack clearness in the telling of a picture story'.

Before 1907 there were some close-ups but mainly only in single-shot facial expression films. Porters film 'the Mill Girl'

contains no close-ups. Porter avoided close-ups because at that time it was thought to interupt the narrative flow rather than contribute to it. 'The Mill Girl' was shot at a distance maintaining some space between the bottom of the frame and the feet of the performers. In some shots the space is narrowed as the narrative reaches a climatic high-point. In a number of shots the characters enter and leave the frame by coming toward the camera. They move to the centre of the frame and the middle distance for the significant action. This is to encourage the spectators eye into the scene and centre the important action in a way that it can't be missed. Before this most films had the important action happening in the side of the frame and a number of things were happening in the rest of the frame, so much so that the observor was very often confused by the scene. Shots were often so short that they didn't give the observer enough time to read or understand their content. Led by screen direction, centering and by the relation between shots the audience would grasp the essential action quickly. The film-maker was beginning to take direct steps to ensure what the audience would see. The observer was no longer given enough time to examine all the details of the shot. The film-maker now controlled what the audience would see.

The perceptual function of narrative in that period and later in contemporary cinema was to choose, plan and communicate a story in order to "achieve specific time-bound effects on a perceiver" Quoted from Narration in The Fiction Film (iv)

The audience were persuaded that what they were observing was such a good portrayal of reality that they could perceive the

film as reality. In this sense narrative was successful in its process of combining separate parts to make a whole. The whole being a story represented by the film through the vision of an invisible observor.

"The camera lens should represent the eyes of an implicit observor taking in the action. By framing the shot a certain way and by concentrating on the most significant details of the action, the director compels the audience to see as the attentive observer saw. The change of shot will then correspond to 'the natural transference of attentions of an imaginary observer".

Quote from V.I. Pudovkin's 1926 Monography Film Technique

CONCLUSION:

The purpose of my thesis has been the observation of images and how we view a sequence of images. My thesis consisted of three Chapters. The first Chapter discussed how the pioneers of optical illusion prepared the way for the birth of cinema. I discussed how the perceptive phenoenmon,the Persistence of Vision influenced the creation of optical devices. These devices played a part in the successive path of technological growth in the persistence of vision and enabled a spectator to see a series of static images as a single complete movement and allowed the illusion of continuous motion on which film is based. The begining of cinema marked an end of the technological development of optical devices designed to demonstrate motion.

The Second Chapter discussed Perceptual Theories. These theories analysed our visual awareness, there subsequent experiments demonstrated how we perceive images and motion. I discussed introspection and the question of images existing if we are not there to see them? and how mental images are represented in perception and mental imagery. I talked about how an object has as many colours as there are ways to look at it, and how conditions effect how we look at something.

The Final Chapter was a discussion on narrative in early motion pictures. I wanted to illustrate how the problems of time and space could be solved by editing. The editor was often responsible for the manipulation of differing space and distant locations to form a continuous and coherent story. These films were edited to install a sense of realism so that the spectator,

for the period of time that he watches the screen cannot differenciate between reality and the appearance of reality. Our perceptual analysis of the film persuades us that the existance of the point of view toward the cinema justifies the continuous movement.

I hope my thesis was successful in its brief analysis of the image in optical devices and early motion picture. Perhaps it will encourage an awareness among us of our environment and of contemporary film .

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