Philadelphia and the Genesis of the Motion Picture

IT IS possible that a future Macauley will establish Philadelphia as the center of what, according to Sir Willmott Lewis,[1] may be called the Scientific Revolution. The influence of The Franklin Institute and the University of Pennsylvania, a growing industrial fabric, and the presence of a ready-money market for new enterprises were some of the factors in Philadelphia which stimulated an uncommonly large number of achievements within the field of applied science during the latter half of the nineteenth century. Among the scientific developments connected historically with Philadelphia, one of the foremost, measured by its profound impact upon latter-day social organization, is the motion picture.

Even in the development of photography, the foundation of the motion picture, Philadelphia may lay claim to an impressive share of contributions: the bromine accelerator, discovered by Dr. Paul Beck Goddard, of the University of Pennsylvania faculty;[2] the first daguerreotype portrait by Robert Cornelius;[3] the vital experiments upon the gelatine dry plate made by John Carbutt;[4] the first stereoscopic photographs on this side of the Atlantic, the work of two German immigrants, William and Frederick Langenheim.[5]

Philadelphia was also the fountain-head of important experimental work upon the magic lantern, which, in a sense, anticipated the motion picture. The brothers Langenheim, whose establishment was located in the Merchants' Exchange, Third and Walnut Streets, may be considered the fathers of the magic lantern trade in Phila-

[1] Address at the University of Pennsylvania, Founder's Day, January 17, 1941.

[2] Marian Sadtler Hornor, "Early Photography and the University of Pennsylvania," *The General Magazine and Historical Chronicle,* January, 1941.

[3] *Ibid.*

[4] Philadelphia *Record,* July 28, 1905.

[5] "Three Dimensional Pictures," *Pennsylvania Arts and Sciences,* IV, No. 1, 32.

delphia, although this invention, attributed to a Jesuit priest, Athanasius Kircher, *circa* 1640, had been placed in use by Charles Willson Peale at the State House in the late eighteenth century. The Langenheims, neglected by most investigators of motion picture history, produced the world's first photographic lantern slides in 1848—a fact that becomes important when it is realized that the exhibition of their slides, named Hyalotypes, constituted the first instances of the projection of photographic images.[6] The Langenheims were followed in Philadelphia during the ensuing quarter of a century by other magic lantern dealers, including W. Y. McAllister, Charles T. Milligan, James W. Queen, E. L. Wilson, T. J. Harbach and Caspar W. Briggs.[7] Various mechanisms, designed by Philadelphia magic lantern dealers in order to simulate motion of projected images, may be classified as part of the evolutionary chronicle of the motion picture, the most notable of the slide mechanisms being an intermittent movement and shutter, invented by Caspar W. Briggs, son of a New England physician and slide-maker. Briggs came to Philadelphia in 1872, devising his mechanical slide four years later. The magic lantern manufacturer, Charles T. Milligan, may be entitled to share in the credit for this device, although Louis Walton Sipley, curator of the American Museum of Photography, has pointed out that Briggs invented the device and Milligan manufactured it. "The importance of the principles employed in Briggs' invention may be estimated by the fact that a claim for originality of invention by Edison in using the intermittent mechanism on a motion film projector was disallowed in the Federal courts in the '90's when it was shown that this principle had been employed in making projected motion pictures, from 1876 on, through the [Briggs] dancing skeleton slide." [8]

The claim that Philadelphia is the birth-place of the motion picture, however, is usually based less upon achievements in the fields of photography and the magic lantern than upon the work of Coleman Sellers, Henry R. Heyl, and Eadweard Muybridge, three experimenters in the motion picture field. Indeed, Philadelphia's claim meets with challenges from New York, Atlanta, West

[6] "The Photograph On Glass," *ibid.*, 27.

[7] Louis Walton Sipley, "The Magic Lantern," *ibid.*, 40.

[8] "Motion Screen Pictures," *ibid.*, 65.

Orange, Chicago, Washington, D. C.—to mention several of the American communities which own to the distinction of having given the motion picture, for good or evil, to a slightly astonished world.

The controversy surrounding the nativity of the motion picture is international in scope, although provincial in aspect; in Great Britain, most of the literature on this subject is concerned with resolving the question of naming the deserving British genius; in France, there is no lack of Gallic fervor in huffing and puffing over the respective claims of Dr. Marey, MM. Lumière, and other Frenchmen. Moreover, there is nothing that defines priority either in the numerous legal decisions, or in the American and foreign patent offices. In Great Britain, alone, there were 145 patents, more or less relating to motion pictures, between 1851 and 1898. The claims submitted publicly by many of the experimenters are passionate and positive. "The cinematograph is British in conception and original in construction," wrote W. Friese-Green, of Bristol. "I ought to know because I invented it." [9] An American claimant, C. Francis Jenkins, implied that the first motion picture machine was purloined from his lodgings. The general literature on the origin of the motion picture swarms with *dicta*, and is sprinkled with manifestations of rancor. Each authority on the technical progress of the motion picture offers a separate interpretation of the motion picture's evolution. In the excellent library devoted to motion picture material at The Museum of Modern Art,[10] this writer found not two experts whose written views coincided in naming the inventors of the vital steps in the genesis of the motion picture.

It is well, at this point, to determine something of the nature of the motion picture before erecting from the debris of disputation its historical relationship with Philadelphia. The motion picture, as a mechanical apparatus, is not a single invention but consists of at least three separate regions of development, viz., the camera, the film, and the projector. The function of the separate segments of apparatus, applied conjunctively, is to obtain maximum efficiency in creating conditions for a phenomenon which has never received a better definition than that given in 1824 by one of its first investigators, Dr. Peter Roget,[11] who named it "Persistence of Vision with

[9] Philadelphia *Public Ledger*, January 9, 1916.

[10] 11 West 53rd Street, N. Y. C.

[11] Roget, who compiled a thesaurus, was an English physiologist (1779-1869).

Regard to Moving Objects." The basic importance of sensory experience as it relates to the motion picture cannot be overestimated. Marey, the French physiologist and himself a motion picture experimenter, described the phenomenon in this simple way: the "retina of the eye has the physiological property of retaining for a brief time the impression of an image after the object which has produced it has disappeared." [12] It may be stated that the motion picture exhibition, stripped to bare essentials, is comprised of projected individual photographs representing an extremely small part of actual motion—yet evoking the illusion of total, uninterrupted motion for the eyes of the spectator. An approach upon historical grounds, therefore, reveals the development of the motion picture as a complex mosaic, having texture rather than structure.

II

The first person to obtain a patent on a motion picture machine was Coleman Sellers. Born in Philadelphia, on January 28, 1827, Sellers was the grandson of Charles Willson Peale, the artist, and of Nathan Sellers, a Revolutionary patriot so skilled in mechanical matters that he was summoned by the Continental Congress from his post as Ensign in the Pennsylvania Associators to make cartridges for Colonial rifles. Coleman Sellers was less interested in the farming career proposed by his mother than in industrial construction. At the age of thirty-one, he had become chief engineer of William Sellers & Co., the Philadelphia machine-tool manufactory. As head of the draughting room in the Sellers firm, he realized the possibilities of the camera in illustrating machinery, and began to experiment in photography. It was two years later, in 1860, that he devised for the entertainment of his family a machine which is epochal in the annals of motion picture development.

At his home, 601 N. 18th Street, Sellers photographed his sons, Coleman, Jr. and Horace, together with Mrs. Sellers in a series of static poses; he did not photograph motion but built a synthetic cycle of motion by photographing related stages of action with a stereoscopic camera, using wet plates. Coleman

[12] Ascribed to Etienne-Jules Marey (1830-1904) is the first method of photographing the flight of birds. *Physiologie du mouvement: le vol des oiseaux,* 1890. His work had bearing upon the early experiments in aeronautics.

Sellers, 3rd, describing his grandfather's device in a letter to this writer, states: "This series of pictures, he [Sellers] mounted radially on a drum which could be rotated with a handle. He then mounted the drum in a case into which one could look with both eyes and turn the handle. What one saw was a moving picture of Grandmother sewing or Father hammering. My recollection is that the motion was very smooth . . . [the device] had one very important point which is the essence of the motion picture. There was a band of steel around the revolving drum with slots in it, a slot for each picture so that one received only an instantaneous glimpse of each picture. If it were not for this detail, the picture would have been blurred. Grandfather made it as a toy with no thought of it being of economical value."

Nevertheless, on February 5, 1861, Coleman Sellers patented his invention (Pat. No. 31,357). He named it the Kinematoscope, although reputedly his relative, Titian Peale, an employee of the Patent Office, suggested the word. It is interesting to note that "Sellers launched a word [cinema] that was far to overshadow his own slight fame," [13] and that his grandfather, Charles Willson Peale, apparently originated the phrase "moving pictures" in advertising a novelty exhibited at the State House in the late eighteenth century. The Peale "moving pictures," however, had no connection with the motion picture.

The fame of Coleman Sellers cannot be regarded as slight. In addition to inventing an imposing number of machine tools, he achieved in later years a distinctive position in the field of electrical engineering by his management of an organization which, for the first time, transmitted power from Niagara Falls. His brilliant work has been recorded in many scientific organs. Following his death in 1907, The Franklin Institute published a biographical article. But no biographical sketch, no reminiscence of Coleman Sellers, excels the crystalline quality of the picture embodied in a letter to this writer from his grandson: "Grandfather was a remarkable man, truly. Anything he went into, he plunged deeply. When Grandmother's teeth needed attention, he bought some books on dentistry and a set of instruments and fixed them himself—not to save money but because he was interested. My last recollections

[13] Terry Ramsaye, *A Million and One Nights,* Simon and Schuster, New York, 1926, p. 17.

of him were the impressions of a small boy but are still vivid. He was about 78 years of age, in ill health, practically totally blind from cataracts. He took up and mastered Braille quite quickly. He bought a phonograph which was then in its early development and immediately started improving the horn by substituting cardboard and fibre horns of various shapes which took away the 'tinney' sound. In connection with his early photographic work, my father told me that grandfather invented the first dry plate for his own convenience as he did not like the wet plates which were difficult to transport. He was the only man in the neighborhood [he then lived at 3301 Baring Street] to have a camera and was frequently called upon to photograph dead babies—the infant mortality was high!"

Exactly nine years to the day after Sellers had patented the Kinematoscope, an audience at the Academy of Music in Philadelphia witnessed "the first public exhibition of Moving Pictures in which photographs of living subjects were shown as if in Motion, by projecting the views upon a screen."[14] The inventor of this motion picture device, the Phasmatrope, was Henry Renno Heyl. Born in Columbus, Ohio, in 1842, Heyl had moved to Philadelphia in 1863, and had achieved success as an inventor of machines for stitching and sewing books. He had also invented many types of paper boxes, including the paper oyster-pail.

Heyl's motion picture invention may have been influenced by Seller's device, although the program notes for the first exhibition of the Phasmatrope state that it was "designed to give various objects and figures upon the screen the most graceful and life-like movements. The effects are similar to those produced in the familiar toy called the Zoetrope . . ."[15] The latter contrivance, patented under that name in this country by William E. Lincoln, of Providence, Rhode Island, was the counterpart of a machine invented by a Frenchman named Desvignes, one of several mid-nineteenth century European experimenters who invented mechanical means for obtaining an illusion of motion.[16] (It is worthy of note that none of the European inventors employed photography in this

[14] Heyl Papers in The Franklin Institute.
[15] *Ibid.*
[16] Henry V. Hopwood, *Living Pictures,* London, 1899.

experimental field.) The Heyl Phasmatrope exhibition at the Academy of Music on Saturday evening, February 5, 1870, was offered as a part of the "Ninth Entertainment of the Young Men's Society of St. Mark's Evangelical Lutheran Church, Philadelphia."[17] The motion picture consisted of an address by Brother Jonathan, an acrobatic performance by a popular Japanese gymnast named Little All Right, and a waltz danced by Heyl and his sister. In fancy costumes, the Heyls posed at the studio of O. H. Willard, 1206 Chestnut Street; the poses were separate but related. In short, it was the same technique Sellers had employed in photographing members of his family in synthetic action. In Heyl's words: "The related photographs were small glass plate positives of selected subjects reduced from wet plate negatives, taken from rapidly succeeding poses by an ordinary camera. The *Phasmatrope,* the exhibiting device, was a revolving skeleton disc around the periphery of which the glass positives were removably placed to register accurately as they intermittently came into the [magic] lantern rays. The rotation of the disc was in absolute control by the operator so that the movements of the waltzers were kept in perfect synchronism with the large orchestra (40 musicians) and the pantomimic gestures and lip movements of Brother Jonathan coincided with the voice of the reader, who supplied the audible words."[18] Heyl not only achieved the first projected exhibition of simulated photographic motion but also anticipated the possibilities of synchronized sound pictures.

Henry Renno Heyl is described by his contemporaries as a man of strong resolution; he was "a little man, thin, wiry, with sandy hair and blue eyes. He wore thick glasses and very often used a pocket magnifying-glass when looking at small objects. He was quite nervous and his brain was constantly working out some idea which he would burst out with when he was in the company of people. He was quite musical, was a good singer, and a devout Christian. He never missed attending the Lutheran Church whereever he was. He was very kind and had a gentle voice."[19] Henry Renno Heyl died in Philadelphia in 1919.

[17] Heyl Papers, The Franklin Institute.

[18] *Ibid.*

[19] From the letter of a contemporary of Henry R. Heyl.

In 1925 the late Charles C. Heyl, showing the original Phasmatrope to this writer, said that his father had always held to the belief that the Phasmatrope embodied the basic operating principles of the modern motion picture. Henry Renno Heyl never obtained a patent on the Phasmatrope, inasmuch as he regarded it as an amusement without commercial possibilities. Concerning the relationship of the Phasmatrope to subsequent motion picture inventions, the *Encyclopædia Britannica* states: "It is of interest to note that the [Phasmatrope] wheel on which the pictures, glass plate transparencies, were mounted was actuated by a ratchet and pawl mechanism giving each image a period of rest on the screen, a method and principle which had to be rediscovered a quarter of a century later."

Sellers and Heyl became friends and each served as an officer of The Franklin Institute. It is plain to see that these two men were akin in character and mind, the quintessence of what Walt Whitman called the "resistless restless race" of Americans. There is general acceptance of the view that Heyl and Sellers conceived the essentials of the motion picture and applied them within the limitations of then existing photographic science; that is, before the advent of transparent flexible film and a camera that could take pictures of motion at a rate of at least sixteen per second. The controversy involving their work is to be expected in view of differing opinions concerning the principles of the motion picture: this controversy even extends to the range and originality of the work performed by Eadweard Muybridge, the third of the three great Philadelphia pioneers.

Eadweard Muybridge, born in England in 1830, came to the University of Pennsylvania in 1885 as a special research worker under the aegis of Dr. William Pepper. Muybridge had been a photographer in San Francisco in 1872 when Leland Stanford, Governor of California,[20] wagered $25,000 with friends that a horse lifted all its feet from the ground at certain full-speed gaits. Stanford employed Muybridge to photograph horses on the run, a difficult undertaking since the finest cameras worked only by long exposures. Muybridge continued work for Stanford until 1881, developing an arrangement for photographing objects in motion

[20] Stanford owned a famous trotter named Occident: see *The Cinema,* by M. Jackson Wrigley and Eric Leyland, Grafton & Co., London, 1939.

with a battery of twenty-four cameras, spaced at close and equidistant intervals, with electrically operated trips. Stanford's contention was proved. Muybridge's success in California was followed by a trip to Europe where he met the foremost experimenters in "persistence of vision pertaining to motion."

The Muybridge studio at the University has been described by Dr. George E. Nitzsche as "an enclosure, along one side of which was a shed about 120 feet long, 11 feet high and 16 feet deep, with the front open; the shed was painted black, and the open front was filled with a network of white threads, arranged horizontally and vertically, crossing each other to form squares of nearly two inches each, with heavier threads marking out other squares of about 12 inches. In front of the shed was a track, along which the animal would move. Frames of white threads, with a black background, were adjusted at each end of the track before and behind the animal.

"Opposite the shed was the camera house, 32 feet long, with a shelf on which were placed 24 cameras, each having a lens three inches in diameter. There were also a number of portable cameras. Another row of cameras were so placed as to take a lateral view, while two other sets took simultaneous views at other angles, so that three different views of the position of the animal in each of the 12 stages of its movements could be obtained. The photograph showing the background of white line squares furnished an accurate record of the motion of the animal's body and limbs, vertically, forward and sidewise, while the time occupied in each of these phases of action was ascertained by the chronograph." [21]

Muybridge photographed animals from the Zoological Garden, models from The Pennsylvania Academy of the Fine Arts and track and field athletes of the University in various phases of action. He was assisted by Dr. William D. Marks, professor of engineering, Dr. Edward Reichert, professor of physiology, and Thomas Eakins, the artist. Dr. Rush S. Huidekoper, one of the founders of the Veterinary School at the University, was the principal model in the illustrations of men riding horses. Among the University students helping in the experiments were Lino Francisco Rondinella, William Bigler, Thomas G. Grier and Edward R. Grier. A number of volumes, entitled "Animal Locomotion," contain photographic

[21] Philadelphia *Record,* September 24, 1916.

examples of the experiments conducted at the University. In 1893, at the World's Columbian Exposition, Muybridge using his own device, the Zoopraxiscope, exhibited the University's photographs of motion, projecting the life movements upon a screen. Terry Ramsaye, who has written the historical account of the motion picture for the *Encyclopædia Britannica,* declares that the Muybridge machine was "practically identical with the machine Meissonier had used," [22] referring to the Praxinoscope, a contrivance with which Meissonier, the French artist, had exhibited Muybridge's animal studies in Paris ten years before the Columbian Exposition.

Muybridge contributed an article on the technique of photographing motion to *The Journal of The Franklin Institute* in 1883.[23] Ramsaye states that Muybridge met Sellers and Heyl at The Franklin Institute, a meeting which introduces the suggestion that Muybridge borrowed the basic principle of his Zoopraxiscope from the Heyl Phasmatrope. This avenue of thought is blocked by the gentle Henry Renno Heyl himself, who wrote: "Mr. Muybridge's Zoopraxiscope, designed about 1880, and used to exhibit his glass plate positives of the Animal Movements, happened to be the exact counterpart of the Phasmatrope, of 1870, of which he was undoubtedly unaware." [24]

Determined in his zeal to unseat Muybridge from his place in the cinematic sun, Ramsaye, in a chapter called "Muybridge in Myth and Murder," writes: "Muybridge, in a word, had nothing to do with the motion picture at all; and in truth, but a small part, if any, in the creative work of the hallowed race horse incident." [25] It is Ramsaye's contention that during the California experiments in the 1870's, John D. Isaacs, a youthful engineer and graduate of the University of Virginia, originated the apparatus used by Muybridge. Those who serve as the "devil's advocates" of Muybridge have asserted that his real name was Edward James Muggridge, that he was unkempt of appearance and constantly smoked cigarettes—criteria that may be stamped as captious and irrelevant. Ramsaye explores in detail the account of a murder for which

[22] *A Million and One Nights,* 44.
[23] "Attitudes of Animals In Motion," *J. F. I.,* CXV, 260.
[24] Heyl Papers, The Franklin Institute.
[25] *A Million and One Nights,* 21.

Muybridge was tried and acquitted at Napa City, California, in 1874, an incident that no reasonable person would use as a yardstick in measuring the significance of Muybridge's work.

The fact remains that Muybridge produced an impact of the first magnitude upon the world of applied science. Benjamin B. Hampton writes this appreciation: *Muybridge proved that motion could be photographed.*[26] Heyl wrote: "between 1870 and 1890 . . . no real progress was made . . . beyond the method employed by Mr. Muybridge." [27] Henry A. Leffman is of the opinion that Muybridge is "entitled to conspicuous recognition," although he contends that "Sellers and Heyl are more prominent in the motion picture development." [28] Thomas A. Edison, who, acording to Terry Ramsaye, was the inventor of the motion picture, wrote: "In the year 1887 the idea occurred to me that it was possible to devise an instrument which would do for the eye what the phonograph does for the ear, and that by a combination of the two, all motion and sound could be recorded and reproduced simultaneously. This idea, the germ of which came from the little toy called the Zoetrope, and the work of Muybridge, Marie [*sic*] and others has now been accomplished . . ." [29] It may be observed here that several investigators share the conviction that the motion picture experiments of Dr. Marey were inspired in some degree by Muybridge. Moreover, Muybridge contended that he consulted with Edison on February 27, 1886, on the matter of synchronizing the animated pictures of the Zoopraxiscope with the Edison phonograph. Edison, years later, denied that Muybridge had discussed this interesting possibility during their meeting.[30]

Dr. Nitzsche, in his analysis of the motion picture, states that Muybridge "was not only the first person to invent a process of instantaneous photography and a system of scientifically analyzing the changes incident to motion, but also of the instrument for reproducing pictures taken from instantaneous photographs upon a screen, so that the life movements taken instantaneously with the

[26] Benjamin B. Hampton, *History of the Movies,* Covici, Friede, New York, 1931.

[27] Heyl Papers, The Franklin Institute.

[28] "The Invention of The Motion Picture," *J. F. I.,* CCVII, 825.

[29] Antonia and W. K. L. Dickson, "Edison's Invention of the Kineto-Phonograph," *Century Magazine,* XLVIII, 2, 207.

[30] *A Million and One Nights,* 44.

process were distinctly visible." [31] In a letter to the writer, Dr. Nitzsche recently wrote: "I think I am safe in stating that Muybridge was the first man actually to produce moving pictures accurately analyzing motion. You may be interested to know that these were done originally on wet glass plates, but only a few years ago I took a few of these wet glass plates, put them on films and the result was a reproduction of motion by a modern medium."

III

In addition to Caspar W. Briggs and the Langenheim brothers, John Carbutt, an Englishman who spent the productive years of his life in Philadelphia, is worthy of consideration as a pioneer in the motion picture industry. Carbutt supplied the flexible film—a celluloid coated with photographic emulsion—to Edison and Jenkins, two of the principal contenders for the honor of inventing the modern motion picture. In 1888, before the film of Eastman was tried at the Edison Laboratory, John Carbutt, then living at 2105 Venango Street, sent to West Orange from his plant at Wayne Junction the film with which the Edison staff experimented. This step, says Ramsaye, was a "great one." [32]

Carbutt served on the sub-committee of The Franklin Institute, together with Henry Renno Heyl and George A. Hoadley, for the examination of a motion picture machine patented on November 25, 1895, by C. Francis Jenkins. This last-named inventor, a native of Indiana, had exhibited his machine in the old building of The Franklin Institute, now the Atwater Kent Museum, before ninety members and fourteen visitors on the evening of the election of officers, December 18, 1895. "With this instrument [the Phantoscope] Mr. Jenkins succeeded in reproducing, in life size, on the screen, the movements and actions of dancers, gymnasts, etc., with remarkable fidelity to nature." On December 1, 1897, at a stated meeting, the Elliott Cresson medal, awarded to inventors, was suggested for Jenkins and referred to the Heyl Committee. The medal was awarded to Jenkins, precipitating an immediate protest from Thomas Armat, who, with Jenkins, had been joint-patentee of a motion picture device. Armat had subsequently joined hands

[31] Philadelphia *Record,* September 24, 1916.
[32] *A Million and One Nights,* 59.

with the Edison group and had engaged Jenkins in litigation. The Franklin Institute's Committee on Science and the Arts examined the Armat protest and dismissed it.[33]

Virtually no consideration whatever is given in the literature of motion picture development to the works of Rudolph Melville Hunter, a prolific inventor, who lived in Philadelphia. Hunter had a considerable number of patents in the field of electrical engineering, and in 1883 had obtained widespread attention for his proposal to the British parliament of a plan for an electric railway for the discussed tunnel between Dover and Calais. In *Who's Who* for 1920-'21, Hunter included the information that he had designed and built the first motion picture projector in the world. The most complete available information on this invention is rendered in the papers of Henry Renno Heyl: "After returning from the 'World's Fair' Exposition at Chicago, in 1893, he [Hunter] devised improvements in photography and motion machines designed to project images from pictures arranged in consecutive order in film form, the film to be intermittently fed forward by mechanical devices, the light to be projected through the pictures upon a screen and the images to be intermittently shut out from view during the feeding of the film of pictures."[34] Hunter arranged for the exhibition of his machine on the Boardwalk, near New York Avenue, at Atlantic City, in the fall of 1894 but apparently was discouraged and the venture came to nothing. This date is significant, inasmuch as the Latham, Lumière, and Armat public screen exhibitions did not begin until various dates in 1895, yet Hunter was so certain of the success of his machine that in his project on the Boardwalk he purchased a building for $24,000 and "reconstructed the interior for the purpose of moving pictures with this 1894 machine."[35] Heyl's papers reveal that Hunter filed an application for letters patent after the completion of his invention "but being mislead as to the dates of invention of Edison, Jenkins and others, and having just gone through with over sixty successful but costly and laborious interference proceedings (litigation) on questions of priority in his electrical inventions,

[33] Report of sub-committee, August 18, 1898, *J. F. I.*, CXLV, 79.
[34] Heyl Papers, The Franklin Institute.
[35] *Ibid.*

he did not undertake to contest priority on the moving picture inventions and subsequently his application was abandoned for want of prosecution."[36] Hunter described his 1894 machine before a gathering at the Electrical Exhibition on Chestnut Street near Eighth, in 1898. A sample of the film he used, found among the Heyl papers, is perforated along the edges, a distinctive technical innovation used by Edison, Jenkins, and others in order to adapt the film to the "feeding mechanisms" of their cameras and projectors.

Thomas Eakins is also ignored as a motion picture experimenter, even though his stature as an artist is increasing with the passage of years. Eakins, born in Philadelphia in 1844, was an uncompromising realist in his painting and preoccupied himself with the anatomical structure of the human body. It was natural, therefore, that Muybridge's work on animal movement should interest him as it had Meissonier in Paris. Eakins, however, appears to have been influenced by Marey's work rather than by Muybridge's for he invented a camera which photographed motion, using a gelatine dry plate, based on a revolving disc method of exposure that Marey is said to have borrowed from Janssen, an astronomical observer. The Eakins camera recorded upon a single plate the animation of human beings at exact intervals. He conducted his experiments for the University of Pennsylvania, and reputedly assisted Muybridge in the studies of animal locomotion. Eakins, a lifelong Philadelphian, died in 1916 with a few medals and a "small flurry of appreciation" for his masterly paintings and no recognition whatever for his motion picture experiments.

IV

The photographic synthesis of motion prepared by Sellers, the screen projection of Heyl, and the photography of motion by Muybridge may be compared with sections of a bridge, the final span of which was set in place with the advent of a flexible film, an achievement attributed variously to George Eastman, Hannibal Goodwin, and Philadelphia's Carbutt.[37] In 1895, a year after the

[36] *Ibid.*

[37] See footnote, *Edison, The Man and His Work,* George S. Bryan, Garden City Pub. Co., 1926, 189. It would appear, however, that Carbutt did not claim the honor of priority for himself—see "A Perfect Substitute for Glass, etc." *J. F. I.,* CXXVI, 478.

Edison Kinetoscope, a "peep-show" device, was introduced, a number of public exhibitions of screen projections, *employing flexible film,* were held in makeshift exhibition halls by Latham, Lumière, Armat, and Jenkins with their respective motion picture machines.

The Jenkins demonstration at The Franklin Institute on December 18, 1895 was indubitably the first motion picture exhibition, using flexible film, ever presented before an American scientific body. This demonstration preceded by two months the exhibition at the Royal Institute in London of a similar apparatus, invented by Robert W. Paul, who was assisted in his work by a young writer and quondam science teacher, H. G. Wells.

Exactly seven days after the demonstration in The Franklin Institute—on Christmas Day, 1895—the first projected motion picture with flexible film ever shown in a Philadelphia theatre appeared at Keith's Bijou, a variety-show house, at 211 North 8th Street. This motion picture machine was named the Eidoloscope, the invention of Woodville Latham, formerly a professor at the University of West Virginia and an officer in the forces of the Confederacy.

The advance notice for the Keith Bijou program in that historic Christmas week states that the "special feature of the week will be the first appearance in vaudeville of Mr. Charles Dickson, the clever and light comedian" in a "mirthful comedietta . . ." Entombed in the same notice is the intelligence that "another new novelty will be" the first appearance of the Eidoloscope, "projecting pictures of dancers, wrestlers, and boxers in life-like action." The Bijou structure still stands and, operating under the name of the New Garden Theatre, is currently devoted to motion pictures.

It is believed that the 1895 exhibition of the Eidoloscope at Keith's Bijou is the first time that a motion picture was presented as a part of a theatrical entertainment.[38] Robert Grau, a famous Broadway impresario in the last century, wrote: ". . . a regard for accuracy necessitates the statement that Mr. Nash introduced in the

[38] Probably the first of its kind in the world. First box office performance in Paris, an exhibition of the Lumière machine, was on December 28, 1895. See Maurice Bardeche and Robert Brasillach, *The History of the Motion Picture,* W. W. Norton & Company, 1938. The Lumière brothers, Louis and Auguste, were manufacturers at Lyons. As in the case of Edison's Kinetoscope, the Lumière Cinématographe was accredited by some investigators to laboratory assistants.

Philadelphia Keith House a machine known as The Eidoloscope before the Cinematograph [Lumière's Cinématographe] was heard of and this was the very first exhibition of moving pictures on any stage in America . . . then came the Vitascope [the Edison-Dickson-Armat machine]."[39] On May 25, 1896, a month after its first appearance at Koster and Bial's Music Hall, in Herald Square, New York City, the "Vitascope was exhibited for the first time in Philadelphia at the Bijou."[40] There were six short scenes, "none more natural or full of fun than the kissing scene between May Irwin and John C. Rice which made so big a hit in the *Widow Jones.*"[41] The Cinématographe (Lumière) was first exhibited in Philadelphia at the same theatre on July 27, 1896. There is an oft-heard legend that Forepaugh's Theatre, 255 N. 8th Street, was the first Philadelphia theatre to exhibit motion pictures, but this story is dismissed by Charles E. Hopkins, who was connected with Forepaugh's and the Dime Museum in the Nineties. Hopkins recently informed this writer that the Dime Museum, located in 1896 at the northwest corner of Ninth and Arch Streets, was the second house in Philadelphia to offer a motion picture program.

The exhibition of the Eidoloscope in 1895 is remembered by Henry Starr Richardson, a pioneer in writing critical essays on the motion picture art and the present chairman of Philadelphia's Theatre Control Board. Mr. Richardson says that the Eidoloscope was crude and not portentous of the industry which is capitalized today at three billion dollars. The crudity of the early motion pictures is further described by H. T. Craven, eminent critic of the arts, who, in a letter to this writer, recalls the first "newsreels" at Keith's Bijou Theatre: "There was one that ran for weeks during the hostilities [Spanish-American War]—a flagpole flew a Spanish flag in the breeze. Up went an American sailor, hauled down the hated 'Blood and Gold' and then yanked up Old Glory in triumph. Tremendous applause and rendition by Charlie Schrader (I think it was Schrader at that period) at the piano of *Hot Time in the Old Town Tonight.* Also in the newsreels was *President McKinley*

[39] Robert Grau, *The Business Man In The Amusement World,* New York, 1910, 144-145.

[40] Philadelphia *Inquirer,* May 26, 1896.

[41] Philadelphia *Record,* May 26, 1896.

on his porch in Canton. President rises from a rocking chair, steps to the edge of the veranda, beyond which are the unseen crowds, raises his high silk hat and bows, while Charlie at the Keith piano produces the inevitable strains of *Hail to the Chief, Who in Triumph Advances,* &c."

One of the first to realize the business potentialities of the new screen entertainment was Sigmund Lubin, who owned an optical business on South 8th Street in Philadelphia. Born at Breslau, Silesia, in 1851, Lubin had come to this country at the age of seventeen. His life is the saga of the successful European immigrant: he established one of the first motion picture studios in America on the upper floors and roof of a building at 916 Arch Street (not at 21 S. 8th Street as is popularly supposed), obtained equipment from C. Francis Jenkins, and registered several patents on equipment built by himself. Later, he expanded his studio by building on sites at Twentieth and Indiana Avenue and in Betzwood, Pennsylvania. By 1915, the Lubin Company was one of the largest production companies.

Lubin made several of the early motion pictures in the back yard of his home, 1608 North 15th Street. One of Lubin's first successes was a cinematic interpretation of the "Passion Play," parts of which were photographed in the Lubin back yard and in Fairmount Park during 1898. Some of the world's first film dramas were photographed by Lubin cameras on Hutchinson Street near Filbert. The motion picture's first scenario, according to Ramsaye, was employed in the Lubin-produced re-enactment of the championship fight of 1897 between Corbett and Fitzsimmons. According to eyewitnesses who have communicated with the writer, the principals in this first drama were a Philadelphia wrestler and an employee of the Philadelphia Sheriff's Office. These two gentlemen followed a written description of the actual encounter: it is remembered that one of the actors was forced to have his head shaved in order to present a better likeness of the bald champion, Fitzsimmons.

Lubin is described by a business associate as "a tall man, with a magnetic and prepossessing appearance; he had a Teutonic accent and a temperament." Lubin not only produced motion pictures; he operated motion picture houses, and sold projectors to aspiring exhibitors. He built a motion picture house on the midway at the

National Export Exposition, held at Thirty-fourth below Spruce Streets in 1899. This was the first structure in America, it was claimed, to be built exclusively as a motion picture theatre. The National Export Exposition Guide mentions "Lubin's Cineograph," an attraction "located on the west side of the Esplanade."

Many legends surround the Lubin name. There is no evidence to support the belief that Lubin established the first motion picture studio in America, or that he exhibited the first motion pictures in Philadelphia. Lubin, however, occupies a special position in the pioneer days of the photoplay. Most authorities are agreed that while Lubin contributed nothing vital to the technical development of the motion picture, no entrepreneur was more active in laying the ground-work for the popularization of this new form of entertainment. Lubin provided the prospective operator of a screen theatre with a Lubin-patented projector, a couple of motion picture films, a Victor Talking Machine, and records—all for ninety-nine dollars. "Lubin will always be remembered," wrote one observer, "as the man who combined dramatic power with the wizardry of finance and made it possible to commercialize the film industry . . ." [42] Lubin made a fortune, but is said to have suffered severe financial set-backs before his retirement. He died in 1923 at Atlantic City, seven years after leaving business.

There were other Philadelphians whose names are prominent in the growth of the motion picture art. One of Lubin's principal aides in the early production of motion pictures was John Frawley, who, until his death in 1937, was identified with an optical business in Manayunk. The first legitimate actor to perform in a motion picture was Joseph Jefferson. The first motion pictures of wild animals in their native habitat were made in Africa in 1912 by Paul J. Rainey, a prominent Philadelphia coal dealer and sportsman. Even in present times, with most of the film production industry located in California, Philadelphians have contributed to the cinematic arts. One of the most recent instances, the recording of music for Mr. Disney's *Fantasia* by the Philadelphia Orchestra under the direction of Dr. Stokowski in the Academy of Music, completed a sixty-nine-year cycle of motion picture history, that began with Heyl's 1870 demonstration in the same building.

[42] *Who's Who In The Motion Picture World,* B. M. Wood, New York, *circa?* 1910.

In the development of the motion picture business, the names of Lubin, Kennedy, Isman, Dittenfass, Earle, the Mastbaum brothers, and other Philadelphians figured prominently in the first three decades of this century. Jeremiah J. Kennedy, born in Philadelphia, started his career as a roadman on the Norfolk and Western Railway. Representing the Empire Trust Company, Kennedy succeeded in organizing the Motion Picture Patents Company, comprised of Biograph and the Edison licensees, in 1908.

The Mastbaum brothers, Jules and Stanley, operated a large number of theatres in the Philadelphia area during their business careers. After Stanley's death in 1918, Jules Ephraim Mastbaum, who had been a scholarship student at the Wharton School, University of Pennsylvania, organized the Stanley Company of America, which, in a few years, became the largest corporative operator of motion picture houses in the nation. According to advice received from A. L. Einstein, who was connected with the Mastbaums from their very first venture, Jules Mastbaum's first motion picture house was opened in 1905 at the southeast corner of Eighth and Market Streets, a few doors from Lubin's optical establishment. This theatre, operated by Mastbaum and Harry Davis, of Pittsburgh, is claimed as the first "nickelodeon" in Philadelphia.[43]

There is a bronze plaque in the Paramount Theatre in New York City attesting that Edison is the father of the motion picture. This, notwithstanding a statement which forms a part of an opinion handed down by Judge Wallace, of the U. S. Circuit Court of Appeals, in 1902: "It is obvious that Edison was not a pioneer in the large sense of the term, nor in the limited sense of the term in which he would have been had he also invented the film."[44]

There are no plaques in Philadelphia erected to the achievements of Sellers, Heyl, Muybridge or any of the other Philadelphians who may be said, accurately enough, to have been pioneers in motion picture development.

Atwater Kent Museum M. J. McCosker

[43] It may be remarked that the same Harry Davis, with Senator John P. Harris, is generally accredited with establishing the nation's first "nickleodeon" in Pittsburgh, Pa.

[44] Edison *vs.* American Mutoscope & Biograph Co., March 10, 1902.