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Early History and Growth of the Motion Picture Industry

By Otto Nelson

In 1893, Mr. C. Francis Jenkins by his invention, the Phantoscope, gave the world something entirely new; with this machine pictures in motion were projected on a screen. He gave a number of private exhibitions, but the first public exhibition of motion pictures ever presented in America was in 1895 with Jenkins' invention at the Cotton States Exposition, Atlanta, Georgia.

The picture on the screen is the foundation of the motion picture industry, which has grown to be the fourth industry in America. Its one and a half billion-dollar investment and all its efforts are toward this end.

What is known as "moving pictures" is an optical illusion. No one ever saw movement in a picture. You sit in a motion picture theatre and see a figure move across the screen. You do not see a moving picture, but a series of stationary pictures flashed on and off the screen. The motion picture projector is so adjusted that you see a picture. The screen is then darkened and another picture is projected; the second picture is almost like the first, and the eye retains the vision while the screen is dark. This is repeated at the rate of 16 to 20 times a second. When the picture is gone, the eye still sees it and does not notice that the screen is totally dark half the time. This persistence of vision, when a series of views representing closely successive phases of a moving object are exhibited in rapid sequence, blends them together and gives the effect of a single picture in which the objects are moving.

The industry has developed so rapidly and motion picture photography of today is so marvelous that we seldom pause to measure the progress which has taken place in so short a time. The entire story cannot be told in the time given to this paper. The 2954 pages of the 24 published *Transactions* of this Society do not tell fully even the story of the technical development.

While the very earliest history is rather obscure, the early conception of the several devices as employed today, i.e., camera, perforator printer, and projector, seem well authenticated in the exhibit to be found in our National Museum. The exhibit is made up almost wholly of the early experimental apparatus of one of our members and the founder of our Society, Mr. C. Francis Jenkins. It is well worth visiting. It was acquired by the museum in 1898, and while not a complete exhibit of cine instruments, it contains every device which has been employed in the art since; i.e., cameras, perforators, developing devices, printers, splicers, and projectors; both intermittent and continuous film feed are shown in all of them as well as stereoscopic cameras and projectors, three color film and paper prints; motion pictures on card; the prismatic ring, a new contribution to optical science; and a high-speed camera, which really deserves the name. As most or all of these will be shown in the motion picture demonstration to follow this paper, perhaps this is a sufficient description of this exhibit for the pictorial presentation of which I am indebted to Mr. M. W. Palmer (also see Fig. 1).

Previous to 1889, there were numerous experiments of simulating motion

Figure 1. U.S. National Museum motion picture exhibit. At right, examples of Muybridge's work; early Zoetropes, etc. At left, machines deposited (1896) by Jenkins, including both intermittent and continuous film-feed cameras; projectors, perforators, printers; developing apparatus; stereoscopic cameras and projectors; paper films and card exhibitors.

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by intermittent illumination of a series of related picture elements — by W. G. Horner about 1833, Coleman Sellers in 1860, Henry R. Heyl in 1870, Edward Muybridge in 1879, E. V. Marey in 1883, and many others.

The motion picture of today is the result of the efforts of Thomas A. Edison, George Eastman, and C. Francis Jenkins. The result of Mr. Edison's experiments was the Kinetoscope. The pictures in animation were viewed through a magnifying lens in a peep hole, an electric light below the film furnishing the illumination. Mr. Eastman's contribution was the development and perfection of the flexible film base; and Mr. Jenkins was the first to project a motion picture on a screen.

Motion pictures in 1896 became the leading attraction of vaudeville and music halls, the program consisting of five or six subjects of from 40 to 80 feet in length. (Fortunately, I am able to present three of these in the film demonstration. One of these is the classic, *The May Irwin Kiss*. They were made in 1895 and loaned for this occasion by Mr. George Kleine, New York.) The novelty soon wore off, and for the next several years, motion pictures were used as "chasers" in the continuous vaudeville theatres.

The first movie theatre, the store show type, was opened in New Orleans in 1896. This idea was tried out in the larger cities but with indifferent success because of the lack of interesting pictures.

When Mr. Edwin S. Porter, a member of our Society, conceived the idea of telling a story by motion pictures and for the Edison Company produced in 1903 the first photoplay, he brought out the kind of picture production that captured the interest of the public, and the motion picture became an essential part of the people's entertainment, which resulted in the rapid growth of the industry. This picture, entitled *The Great Train Robbery*, will be presented in the film demonstration and has also been loaned by Mr. George Kleine. This production was followed by *The Moonshiners* and the comedies *The Dream of the Rarebit Fiend*, *Wanted a Wife*, and many other photoplays produced by the different studios.

During the next three years, thousands of "Nickelodions" were opened in store rooms in all parts of the country. The investment required to open one of these "theatres" was only a few hundred dollars. The equipment consisted of a projector, which could be bought for about two hundred dollars, a platform at one end of the room, on which was located a six by six "booth" in which was placed the moving picture machine. A muslin screen was hung at the other end of the room and two or three hundred chairs, usually rented from the local undertaker, and a wood partition across the front with a window for selling tickets completed the equipment. An "operator" was procured to grind the picture machine, and the show was ready to open.

With increasing public interest came better pictures, improved projection equipment, and the two and three hundred seat store shows were replaced by theatre buildings with seating capacities from 800 to 1200. The phonographs and tin-pan pianos were replaced by great organs and orchestras.

A new milestone was reached in 1913 with the production of feature pictures played by celebrated dramatic stars in the most successful stage plays; then came the magnificent picture playhouses in the cities. We now have the wonderful theatres of the silent drama costing millions of dollars and seating audiences of five and six thousand. Film producers now produce superpictures, the production of which at times amounts to millions of dollars.

All branches of the industry have kept pace with this evolution, from the makers of cameras and film to the manufacturers of projection apparatus, all of them progressing with one thought — to place a perfect picture on the screen.

Perhaps the most important factor was the organization of the Society of Motion Picture Engineers in this city ten years ago, the prime purpose of which was to standardize the industry. Many of us will recall the many beautiful pictures that were ruined because cameras with different frame lines were used on the same work, one camera framed on perforations and the other between. When the old time pictures are presented in the film demonstration to follow, you will frequently see the picture out of frame; also, notice the jumpy motion of the pictures, and when the recently made titles are seen notice the steadiness. The unsteady motion is caused by the perforations of the negative film having different measurements from those of the positive, and the sprockets of the camera, the printer, and the projector may have been different. The framing line, the sprockets, and sprocket holes were the first things standardized, and hundreds of other things have been accomplished by the Society in its effort to place a better picture on the screen.

The motion picture projector and equipment in use until 1904 was of very simple construction, consisting of an optical system, a mechanism providing an intermittent movement, an upper or feed sprocket and a shuttle. It was operated by a crank turned by hand. There was no take-up device; the film while being projected was run loosely into a bag, a box, a barrel, or a basket.

The illumination was provided by an electric arc with half-inch upper and lower carbons using 25 to 30 amperes for both direct and alternating currents. The voltage was controlled by a rheostat of high resistance wire. The lamp house, when one was provided, was a small affair about six inches wide, a foot long, and a foot high. In places where electric current was not available, calcium or lime light provided the light source.

The opening of thousands of store shows during the years 1904 to 1908 created a demand that started the development of the present high-grade equipment. The motion picture engineer has kept pace with the growth of the industry. The building of larger and more beautiful theatres that started in 1914 included better projection equipment.

Until 1904 or 1905 the one projector in the six by six booth was handled by a picture machine operator or crank turner who at the end of each reel projected a lantern slide which read "Just a moment please while the operator changes reels." This has changed with the development of the industry. We now have well constructed, properly