



CINEMATOGRAPHY

Pioneers of Early Cinema: Louis Aimé Augustin Le Prince (1841-1890?)

Though he lacked the financial backing and research facilities of Thomas Edison and the Lumière brothers, the acknowledged pioneers of motion pictures and the cinema, and did not live to exploit his invention commercially, Louis Le Prince came close to achieving a successful process of cinematography.

Le Prince was born in Metz on 28 August 1841. His father, a French Army officer, was a friend of the photographic inventor, Jacques Louis Mandé Daguerre, and the young Louis often visited his studio. Le Prince studied chemistry and physics at the University of Leipzig then worked as a photographer and painter.

In 1866 he met and became friends with John Whitley, a young British engineer. At his invitation, Le Prince came to Britain, to the Yorkshire city of Leeds, where he joined the family engineering firm, Whitley Partners, first as a designer and then as the manager of the valve department. In 1869, Le Prince married Elizabeth Whitley. During the Franco-Prussian War (1870-1871) Le Prince went to France to enlist in the French Army. In the siege of Paris, he was an officer of Volunteers. On his return to Britain, he and his wife established the Leeds Technical School of Art in Park Square, Leeds. He specialised in the tinting and firing of photographic images on enamel, ceramic and glass.

Le Prince moved to New York in 1882 with his family to work on the development and promotion of the Lincrusta wallpaper process, in which John Whitley had an interest. When the patent rights were sold to an American company, Le Prince found work managing the Monitor and Merrimac Panorama in New York. This was a huge building 150 feet in diameter containing a panorama painted on 20,000 square feet of canvas, with a foreground made of natural earth, grass, trees and other objects.

During this period, many of the technologies associated with the invention of cinema were being developed. Eadweard Muybridge toured the United States and Europe showing examples of his sequential photography; Etienne Jules Marey perfected the revolving-gun camera which took up to 12 pictures a second. In 1885, George Eastman's American paper roll film became available and this was followed by his commercial development of celluloid film in late 1889.

Le Prince's wife recalled that 'his conception of moving photographs and earliest experiments to find the best material for films dated back to Park Square, Leeds before his journey to New York with my brother.' In New York, Le Prince was allowed to use workshop facilities at the New York Institute for the Deaf, where his wife taught art. He produced his 16-lens camera in 1886. This complex device was the subject of Le Prince's American patent, applied for on 2 November 1886. A British patent, applied for on 10 January 1888, the same day the American patent was granted, contained an extra clause relating to a single-lens camera and projector, and was issued on 16 November 1888.

In the patent, Le Prince describes how the 16-lens camera was meant to work. At the front of the camera are sixteen lenses, each controlled by an electro-magnetic shutter. Above these are two viewfinder lenses. The front of the camera could be racked backwards and forwards for focusing.

Fitted onto the rear of the camera was a magazine containing two sets of spools of paper film, side-by-side, with the upper 'take-up' spools connected to a drive shaft that could be operated by hand or attached to a motor. Unfortunately, this magazine has not survived and all that exists on the camera are the two parallel slots into which the magazine fitted.

The spools of unexposed film were in the lower part of the magazine. In his Provisional Specification for the patent, Le Prince stated that the 'take-up' spools at the top were fitted with gear wheels connecting with a commutator and battery which fired the shutters in sequence. In the Complete Specification (10 October 1888), this was changed to a complicated system of gearing.

In operation, each roll of film was moved alternately. While one remained static, clamped in position behind the first set of eight lenses which each opened in sequence to record images on the film, the other roll was moved up a distance 'equal or greater than the total height of the square openings in front of the lenses'. This film was then clamped in position and exposed using the second set of eight lenses as the first film was moved on. Thus images 1 to 8 were recorded on the first film, 9 to 16 on the second, 17 to 24 on the first, and so on through the length of the films. The camera was designed to work at about 16 pictures a second. Only one series of 16 images taken by the camera survives.

Le Prince returned to Leeds in May 1887, leaving his wife in New York. At a workshop at 160 Woodhouse Lane, Leeds, he developed a single-lens camera which he used to make moving picture sequences at the Whitley family home in Roundhay and of Leeds Bridge in 1888. It is reasonable to assume that the two Roundhay scenes were initial try-outs of the camera. These were made prior to 24 October as Le Prince's mother-in-law, who features in one of the films, died on that date. Encouraged by the success of these films, it is likely that Le Prince wanted another subject that was full of movement. Leeds Bridge, with its bustling activity was a good choice. So, sometime in October Louis Le Prince and his eldest son Adolphe climbed to an upper storey of a building at the south-east end of Leeds Bridge occupied by one of his suppliers, Hicks Brothers, the ironmongers. Louis and Adolphe set up the camera on its four wooden legs at a window overlooking the bridge with its horse-drawn wagons and carriages, and at a suitable moment began cranking the camera's handle.

E Kilburn Scott, writing in 1931, described the camera's operation as follows:

'The film, 2¼ inches (60mm) wide, is wound from one to the other of a pair of ebonite spools about six inches in diameter, one above the other. The top one is revolved intermittently by a cam bearing a number of teeth which engages with projections on the hub of the spool. The film is thus drawn up through the "gate" behind the lens in a series of jerks. At each exposure, it is held fast by a flat brass plate also operated by a cam. The plate moves back slightly when the film is being pulled through, to prevent scratching...Light is cut off from the film during movement by a circular slotted brass shutter, which revolves behind the lens in the same way as in modern machines. The shutter is a robust affair, and the opening of it is adjustable...To assist in promoting smooth, even motion the spindle of the lower spool carries a heavy brass flywheel. The intermittent drive on the top spool was unvaried, whatever the amount of film the latter carried'

This resulted in uneven spacing of the frames throughout the reel. One of the important technical problems of cinematography, solved by W K L Dickson of the Edison Company with the introduction of sprocket holes, was how to record regularly-spaced pictures on the film so that each successive image was in register and could be projected with absolute steadiness on the screen. A film photographed with a mechanism that did not register each frame precisely would have to be projected using the same, or identical, apparatus on which it had been taken.

At this stage Le Prince was working with paper-backed stripping film, in which the base was separated from the gelatin negative after processing. He was also investigating the use of celluloid film that started to become available in 1888 and obtained long lengths from the Lumières in Lyon. Alongside this he was developing a 'deliverer' or projector and there is reasonable documentary evidence to suggest that he was successful in projecting moving images, at least in his workshop. Tantalisingly, the apparatus seems not to have survived.

In 1890, Le Prince wrote to his wife that he was planning to return to New York and she hired premises in preparation for the demonstration of his moving pictures. But first, Le Prince went to France to visit his brother, an architect in Dijon, on family business. He was reported to have been seen boarding a train at Dijon on 16 September 1890 to return to Paris and meet friends from Leeds. However, Le Prince did not arrive and was never seen again, despite exhaustive enquiries by his family and the British and French police. Various theories abound as to the cause of his disappearance. Recently, it has been claimed that a photograph of a drowned man in the Paris police archives is that of Le Prince.

According to a statement made by Frederic Mason, the joiner who constructed the wooden body of Le Prince's single-lens camera, 'After waiting about a month, Mr Longley [the mechanic who worked for Le Prince] and myself entered the workshop and found everything quite normal, the machines intact, and tools, drawings, photographs, as well as a quantity of discarded material, lying about. Mr Richard Wilson, a friend of the family and manager of Lloyds Bank, Leeds, took charge of all the effects and proceeded to dispose of such parts as could readily be sold....Mr Wilson retained the camera, parts of the projector, including a lens...and a machine with multiple lenses that Mr Le Prince made in Paris in 1887 for the purpose of "proving his patent". They eventually went to Mrs Le Prince in New York City and were kept there until October 1930'

Le Prince's disappearance was not the end of the story. His widow and son, Adolphe, were keen to advance his cause as the inventor of cinematography. In 1898 Adolphe appeared as a witness for the defence in a court case brought by Edison against the American Mutoscope Company, claiming that Edison was the first and sole inventor of cinematography (and thus entitled to royalties for the use of the process). He was not allowed to present the two cameras as evidence (and so establish Le Prince's prior claim as inventor) and eventually the court ruled in favour of Edison; a year later that ruling was overturned.

In 1930, Le Prince's daughter Marie came to Britain for the unveiling of a plaque on the site of her father's workshop in Leeds, bringing with her the two cameras which she presented to the Science Museum. These are currently on show at the National Media Museum, Bradford.

Further reading

Richard Howells, 'Louis Le Prince: the body of evidence', *Screen*, 47:2 (2006), pp 179–200

Simon Popple, 'Le Prince's Early Film Cameras', *Photographica World*, 66 (1993), pp 33–37

Christopher Rawlence, *The Missing Reel: The Untold Story of the Lost Inventor of Moving Pictures* (London: Collins, 1990)

E. Kilburn Scott, 'The Pioneer Work of Le Prince in Kinematography', *The Photographic Journal*, 63 (1923), pp 373–378

E. Kilburn Scott, 'Career of L A A Le Prince', *Journal of the Society of Motion Picture Engineers*, 17 (1931) pp 46–66

National Media Museum
Bradford BD1 1NQ
Tel: +44 (0)844 856 3797
Fax: +44(0)1274 723155
www.nationalmediamuseum.org.uk

Updated June 2011