



Light!

The magic lantern and digital imaging. Similarities between the 19th and 21st centuries

Nowadays, no one calls into question the all-pervading power of images in our world. Never before have creation, communication and the visualisation of images by means of highly diverse tools and devices been so enormous, so overwhelming and so powerful. The magic lantern, together with the light beam projector box, constitutes the means of visual communication which is the basis of this current-day reality.

This exhibition seeks to increase awareness of what the magic lantern was and what its shows were like, chiefly by means of a selection of glass slides for magic lanterns preserved at the Cinema Museum, many of which are on display to the general public for the very first time.

But the purpose of this exhibition does not end here, but rather it aims to go much further, searching for affinities between this 19th-century pre-cinematographic spectacle and the visual culture of the 21st century. They are two realities far removed in time and in terms of the technology used, but much more closely related to each other than one might imagine. In this regard, certain analogies can be established between the uses of the images of 19th century lanterns and those of the new technologies of the 21st century. We will thus strive to determine a link, a common thread, between the visual culture of our ancestors and our own, in which technology has changed, but the intentions and aims and, ultimately, the fascination for images haven't.

The magic lantern

The magic lantern was the most popular, most widespread, longest-lasting, most creative and most versatile visual communication device prior to the cinema. For almost 250 years, this projector of still and artificially animated images astonished diverse and heterogeneous audiences, who were not accustomed to seeing anything like them.

Its technical principles, known since the mid 17th century, remained almost unchanged until the end of the 19th century, coinciding with the advent of cinema. It consisted of a box, inside which there was a light source and lenses enabling the projection of images, which are painted or fixed onto a glass slide, onto a screen located in a dark room.

Both at the travelling shows and fairs of the 18th century and in the projections in various types of places in the 19th century, the whole world, both the known and the unknown, could be seen on the screen through the beam of light from the magic lantern, invoking the great communicative power that images had and indeed still have.

Basic chronology of the magic lantern

1659	The first description of a magic lantern in the notes of Dutch scientist and astronomer Christiaan Huygens.
1665	T.R. Walgenstein from Denmark became the first person to

	perform public screenings with magic lanterns in towns and cities across Europe. From that moment onwards the number of magic lantern projections didn't stop rising.
1676	The German, J.C. Sturm published the first printed graphic representation of a glass slide for a magic lantern and designed and drew a small portable and manageable lantern, a paradigm of what most lanterns would be like thereafter.
1713	S.J. Rhaneus designed the first glass slide for a magic lantern with a mechanism to add movement to the projected image.
1798	Physicist and balloonist Étienne-Gaspard Robert, known as Robertson, launched his magic lantern shows in Paris called <i>phantasmagorias</i> , played using a <i>phantascope</i> , a special lantern.
1823	Englishman P. Carpenter conceived a system for the printing of the outlines of drawings on a glass slide, in order to apply it to the industrial production of glass slides for magic lanterns.
1849	The Lagenheim brothers obtained a positive photographic image on a glass slide which they called a <i>hyalotypes</i> , thereby opening up the possibility of projecting photographs with a magic lantern.
c. 1850	Launch of the industrial production of magic lanterns for home use. The French company, Lapiere was one of the pioneers.
1865	D. Salomon invented the chromolithographic process for printing a coloured drawing on a glass slide. This system was distributed by the J. Barnard & Son company for the glass slides of magic lanterns.
1866	J. Beale created the <i>choreutoscope</i> , a glass slide for magic lanterns which made the synthesis of the movement by means of a system for pulling the slide, based on the Maltese cross. It was a system which would later be used by cinematographic devices.
1895	The first film screening for a paying audience on permanent premises took place in Paris, organized by the Lumière brothers with the <i>Cinématographe Lumière</i> , a device they had invented themselves. At first, these projections were interpreted as enhanced magic lantern projections. The traditional magic lantern projections quickly became a distant memory, with the exception of the educational and domestic fields, where they survived for a further few decades.

19th century lantern scenes and the audiovisual culture of the 21st century. Shared experiences

The magic lantern reached its peak of importance in the 19th century. It became established as an audiovisual show format at theatres, it was used as a teaching resource at schools and conferences, it could be found in homes as a form of children's entertainment and was even used in the streets as an advertising tool.

The roots of our current-day audiovisual culture can be found not only in 20th century films and television, but also in the 19th century, with the lantern being its furthest-reaching medium. When today we stare wide-eyed at a timelapse showing the accelerated passage of time over a landscape, we experience the same fascination as the spectators of *dissolving views* at that time. Digital technology has resulted in new shows based on live video manipulation (as in the case of video jockeys), in other words, a return, in a sense, to the art of the lantern technicians who, unlike their counterparts in the cinema, projected and handled the slides live and created a different show every time.

At the theatre

The lantern expressed its most spectacular facet at the theatre. Seeing faraway places, a city moving from day to night, animated images with a comic gag and moving abstract images were commonly-used resources at a lantern session. Venues ranging from neighbourhood halls to large theatres such as the Liceu Opera House, in Barcelona, scheduled these types of shows. The live projection and handling of the slides was complemented by storytelling, music and sound effects. Throughout the 19th century, the lantern sessions were given different names, such as *phantasmagorias*, *dissolving views* and *agioscopes*.

Similarities between the 19th and 21st centuries: Laughing

These slides contained short comic scenes, with mechanised animation of the image, designed to make the audience laugh during the lantern sessions. We also use images with comic scenes for entertainment today. For example, a GIF is a funny short film in a repeat loop.

However, one of the major differences between the above and the lantern slides is that nowadays, as a result of the internet, we have millions of images of this nature. Moreover, as we know, these comic images no longer form part of a show and are, instead, regularly used for communication, mainly via the social networks.

This comparison applies to the slides num.: 10, 11, 12, 21, 22, 23, 34, 35, 36, 46, 47, 48, 56, 57.

The GIFs on display come from the following website: <https://giphy.com/>

Similarities between the 19th and 21st centuries: Artistic practices

The *chromatropes*, which produced an image similar to that of a kaleidoscope, as well as other slides with abstract images, often formed part of the lantern shows. These images livened up the evening with optical illusions and spectacular perspectives.

Nowadays, various artists also use technology to create live images to play on the audience's senses. These images are often accompanied by other artistic practices, such as music, dancing and performances. One good example is *Hoth*, a video with images created by a computer and electronic music, resulting from the partnership between Alba G. Corral and LCC (LasCasiCasitone). *Hoth* was the result of an artistic residency and a performance held in Sweden in January 2016 (Elektronmusikstudion, a Swedish electroacoustic music and sound art centre, and Art's Birthday Party).

This comparison applies to the slides num.:14, 24, 25, 37, 38, 48, 49. Audiovisual: *Hoth*, created by Alba G. Corral and LCC (LasCasiCasitone). Sweden 2016. Further information at: <http://blog.albagcorral.com/> and <http://lascasicasitone.com/>

Similarities between the 19th and 21st centuries: The passage of time

Dissolving views are various images projected in a sequence with a double or triple-objective lantern to simulate the effects of the passage of time. Thus, spectators could see, for example, the changes of the seasons on a single landscape or the transformation of a city from day to night.

Today, capturing the passage of time and reproducing images based upon it continues to arouse the interest of numerous photography fans. One of the techniques most widely-used is time lapse, a video

animation based on a set of photographs taken in the same place at different moments. In this way, the evolution of a landscape, a city or an object photographed over a long period of time can be displayed.

This comparison applies to the slides num.: 15, 16, 26, 27, 39, 40, 51, 52.

Audiovisuals: Time lapse videos corresponding to the following YouTube videos:

- *4 seasons time-lapsed in 40 seconds [OFFICIAL]*+ User: NCarolina17, 05/10/2012.

- *Magical Europe - 4K Timelapse 歐洲30國縮時攝影*+ User: Stan Chang, 18/04/2014.

- *Budapest 'Daynight' (timelapse)*+ User: Greg Florent, 13/02/2016.

- *Château de Chillon*+ User: Jérôme Farine, 31/07/2014.

Similarities between the 19th and 21st centuries: Seeing the world without leaving your seat

One of the attractions of the lantern sessions was undoubtedly the views of cities, monuments and works of art from all over the world. In those days, travelling was expensive and potentially dangerous, this made the distances between places seem much longer. Seeing European cities and remote places on the planet, works of art and famous monuments from a theatre seat without paying a fortune for the privilege was, therefore, a bargain.

Today, we still enjoy travelling around the world without leaving home. Luckily, Google Street View and Google Art & Culture are available to us, two virtual browsers enabling us to walk through the streets of different cities around the world and explore the history, culture, museums and other well-known places on the planet.

This comparison applies to the slides num.: 6, 17, 18, 19, 20, 28, 29, 30, 31, 42, 53.

App: Google Street View and Google Art & Culture, developed by Google in 2007 and 2011 respectively.

Mechanical slides/moving image

By combining more than one sheet of glass or glass and an opaque element on the same slide, it was possible to animate the projected image with components integrated into it or replacing each other. This technique was already applied to the oldest projections, as S.J. Rhaneus outlined in 1713, when he published the first engraving of a mobile slide for a lantern, and it was extended and perfected throughout the 19th century.

Mobile slides have very diverse systems for achieving these effects: sliding sheets of glass with silhouettes travelling over a landscape; handles, levers and pulleys which trigger masks partially covering the main image to achieve a sudden change in the image; zips, double zips and eccentric wheels making several sheets of glass rotate in the opposite direction to obtain visual effects, and concentric discs enabling the reconstruction of movements, such as those of the planets in the Solar System.

The phantasmagoria

A phantasmagoria was a kind of lantern show which enjoyed great international success in the late 18th and early 19th centuries. Philipsthal and Robertson were the creators of this show, organised as an immersive experience. With the lantern and screen hidden from the eyes of the audience and a particular atmosphere combining the supernatural and the scientific, the phantasmagoria explored the limits of the credulity of the spectators, invoking ghosts and spirits.

The phantascope

The phantascope is an advanced magic lantern model patented by Robertson in 1899. The magic lantern spectacle known as *phantasmagoria* was performed using this device. It was mounted on a wheeled frame allowing it to move towards and away from the screen, and it often had a mechanism to adjust the objective according to the position of the device, so as to avoid blurring. The phantascope, permanently hidden from the eyes of the audience, showed images coming and going, or growing and shrinking, and sometimes projected onto water or smoke.

Monsters, spectres, skeletons and ghosts, but also faces of the deceased, spiders, wizards and demons, appeared accompanied by sounds and terrifying elements which captivated those who attended the phantasmagoria performances.

Royal Polytechnic Institution

The Royal Polytechnic Institution in London was one of the chief exponents of the lantern in the 19th century. Both a science museum and a theatre, the Royal Polytechnic had an auditorium with 1,500 seats and a 10 by 8 metre sized screen. Lectures and shows, with the most sophisticated projection technology of the age were held there.

At school and the athenaeum

The lantern was also an educational resource, both in the classroom and at conferences. Teachers, scientists and explorers used the projected image, visible throughout an auditorium, as a device to enhance their speeches or to perform experiments. In 1849 the Girona Secondary School Institute purchased a giant lantern for classroom projections, together with a collection of astronomical slides.

Similarities between the 19th and 21st centuries: Discovering space

Astronomical slides were an ideal resource for illustrating the different phenomena which occur in space. Thus, these slides, with their complex mechanisms, enabled students in the classroom and audiences at conferences to understand, for example, the movements of the stars in the Solar System, the rotation of the Earth and the influence of the Moon on the Earth's tides.

Solar Walk 2 is also inspired by this interest in discovering space and, in particular, our planetary system. This application is an interactive encyclopaedia of the Solar System which seeks to explore its different planets and the phenomena which occur there, using the latest physical data and photographs.

This comparison applies to the slides num.: 25, 26, 27, 31, 32, 33, 34, 35, 45.

Audiovisual: on Solar Walk 2, an application developed in 2016 by Vito Technology Inc.

Similarities between the 19th and 21st centuries: Discovering animals

Slides with drawings of different species of animals were often used to help learn their names, see what they are like and where they live. Thus, these images could be more basic for illustrating a schoolteacher's explanations or more complex and detailed for the master class of a scientific specialist.

Nowadays, images remain crucial for studying the environment. Similarly, today we have new technological tools such as tablets which can help us to assimilate new concepts, according to our age and level of education. Animal Sounds is an educational application designed for children, enabling them to learn the names of animals, the sounds they make and the habitats they live in, all in an interactive and entertaining fashion.

This comparison applies to the slides num.: 46, 47, 48, 49, 50, 51, 52.

App: Animal Sounds, developed in 2014 by Papumba.

Similarities between the 19th and 21st centuries: Discovering works of art

The use of the projection of photographs of monuments and works of art revolutionised the teaching of the history of art at secondary schools, colleges and universities. For the first time, teachers were able to coordinate their speeches with the works they were talking about, while those who listened were able to see them in large dimensions without having to leave the room.

Nowadays, historians and specialists use different technological tools to gain access to images of artworks. With a digital library containing over two million images, Artstor is one of the most widely-used, high-quality resources in education and artistic and visual research.

This comparison applies to the slides num.: 36, 37, 38, 39, 40, 41, 42, 43, 44

Audiovisual: on the Artstor website, created in 2003.

Theatrical Life Models (slides num. from 63 to 80)

The slides known as *theatrical life models* consisted of sets of photographic slides, some coloured by hand, which depicted a moralising story, frequently addressing a social vice such as alcoholism, or acted out traditional songs, plays and so on. Most of the stories were by unknown authors who wrote for the working class of the time, covering subjects symbolising the struggle of good against evil or ruin against redemption. The projection of these types of slides became highly popular from the 1870s onwards at lantern sessions in theatres, as well as in the educational and religious worlds.

The different photographic sequences on the slides were performed by actors, often amateurs, with the appropriate decor in a photographic studio. Narrative techniques attributed to the cinema such as the flashback were used in these stories.

The introduction of photography into the magic lantern projections

Not long after the invention of the photograph (1839) it was found that the resulting images could also be fixed onto a glass slide and projected through a magic lantern. The first glass slides for magic lanterns with photographic images date back to 1849.

The Langenheim brothers were the first to market these types of slides, which monopolised the market from the 1880s onwards, when millions of them were produced on highly diverse subjects. Their advantage over those painted by hand lay in the unquestionable veracity and realism of the image, which further increased when they were coloured by hand, work which was carried out by children and women as cheap labour.

At home

In homes, the lanterns' primary audience were children. Sets of slides with popular folk tales, comic strips and stories about modern technologies such as aviation were all designed for them. The lantern could also be used as a toy in their hands, enabling them to be the projectionists themselves. The domestic slides were smaller and the lanterns were less powerful than those in the professional circuit.

Similarities between the 19th and 21st centuries: Storytelling

The slides with fairy tales such as *Cinderella* were designed to explain popular stories to children in a more striking manner, different from the traditional format.

Books are still undoubtedly the most popular medium for telling children stories. However, technology can also provide new ways of explaining them. Thus, we can find different fairy tale applications for the tablet, such as *Cinderella Dress Up & Story*, designed to enable children to read and interact with the story, regardless of their age.

This comparison applies to the slides num.: 32, 36, 40.
App: *Cinderella Dress Up & Story*, an application created by Tabtable.

Similarities between the 19th and 21st centuries: Learning the alphabet

Some slides were useful in that children could learn basic concepts such as the alphabet and numbers by playing with their brothers, sisters and friends at home.

Today, we also have technology tools enabling children to learn new things in a fun way. Tablets and the different educational applications based on interaction are among parents' favourite devices, because their children can learn to count or read with them. *ABC Toyland*, for example, is a child education application for learning the alphabet by means of entertaining and interactive activities.

This comparison applies to the slides num.: 18, 19, 20, 21, 29, 30, 31.

App: *ABC Toyland*, application created by Papumba.

The industrialisation of the manufacture of magic lanterns

In keeping with the momentum of the industrial revolution, the manufacture of magic lanterns and glass slides, until then hand-made objects, became industrialised in the mid 19th century. The first specialised factories came into being in France and England (and in Germany towards the end of the century), bringing new and more affordable products onto the market.

Although they also manufactured lanterns and slides for professionals, schools and athenaeums, most of the products they marketed were for use at home, as toys to entertain children from the middle classes in Europe and North America. These types of lanterns were simple and low-priced, and the optics and lighting system were often shoddy, but the polychrome effect of the devices' shape and outer decoration was very rich and attractive. The slide drawings were lithographed onto the glass.

In the street

By the 1870s street advertising projections had begun to appear in cities like London, New York and Paris. These projections combined

advertises with slides containing views and comic action. Some newspaper publishers' also used street projections to provide news on special occasions such as election nights.

Similarities between the 19th and 21st centuries: Outdoor images

On the one hand, large-scale advertising images still occupy a significant position in the streets of our major cities. However, nowadays these images are no longer projected and are usually displayed in another form: on screens. An excellent example is undoubtedly Times Square, a landmark in New York well-known above all for the giant screens covering the different buildings surrounding it. In different ways, these screens display all kinds of adverts and, on some occasions, also show the most important news stories of the day.

Moreover, certain artistic practices have found inspiration in these outdoor projections for proposing transitory events beyond the museum itself. The most obvious example is the mapping video, a projection technique used to display images on any kind of surface, including façades, urban furniture and building interiors. Its purpose is to interact with a space, combining or relating certain images projected on its surface.

Irrelevant, for example, is a mapping created by the ARCAAN collective, presented at the 2015 International Mapping Festival of Girona, which proposes interaction between the façade of the emblematic Casa Masó in the city and the projection of images by means of combinations of architectural elements and geometric shapes, spots of light and optical illusions.

This comparison applies to the slides num.: 1 to 8.

Audiovisuals:

- *Irrelevant*, created by ARCAAN and presented at the FIMG in 2015.
- *Digital Signage in Times Square New York*, uploaded onto YouTube in January 2016 by the user Seasam.

The tools of the lanternist

Apart from the magic lantern and glass slides, the lanternists used other accessory elements for their projection sessions, such as screens, slideholder carriages, scripts, objectives, lenses, reading lights and so on.

Theobald & Co.: Extra Special Illustrated Catalogue of Magic Lanterns, Slides and Apparatus

Product catalogue of the Theobald & Co. company, a manufacturer of magic lanterns, glass slides and other related accessories, which operated in London from 1878 to 1902.

It provides a clear example of the products offered by companies specialised in the marketing of magic lanterns. In it we can observe not only the different types of lanterns - both toys and professional tools - but also the wide range of names and types of glass slides, as well as all kinds of accessories (lighting sources, screens, optics, slideholders, etc.).

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