

These shows have taken place in often wonderful environments from at one extreme a Steam Rally in a tent under the shadows of Harry Lee's magnificent swing boats (in October 1967), to the lecture room of the Victoria and Albert Museum (in April 1971). In between these two locations we have worked in village halls, colleges and, even, private garages! In some cases we have had to remove grand pianos, harps and dog excrement before the show could begin.

Each show has its particular memory to this day, but the flavour and structure of each programme has always had its basis in the past while remaining aware of the contemporary climate. The content has always been related to material in the collection but staple ingredients have usually included: humour, travel, education, entertainment and dissolving effects. The programmes have usually been adapted towards the specific interests of the audience, if known beforehand. Their reactions have usually been wonder at how those effects are achieved 'up there on the screen'. When presenting shows it has always been a pleasure to meet the public – even if we were nervous that there might be a local lanternist in the audience who can recall their shows of the past. Indeed, there once was a lanternist who had cycled the country lanes with a lantern strapped to his back and who recalled that he always tried to avoid the screen appearing totally white between slides – a timely criticism!

These ninety-one shows are all chronicled in my present phantasmagoria display. It is possible to identify individual shows but generally I extol the pleasure all the shows have given and feel in a small way one is trying to keep alive a tradition of cultural heritage which has horrified, entertained and given pleasure to many people before us on an international scale. Like T. C. Hepworth, I maintain that:

The magic lantern has always been one of the most popular instruments ever made. So popular has it been, that children by the thousand recognise its charms, while many of more mature years have a secret hankering after it, which they would fain leave unacknowledged: 'For it is but a toy' think they, 'and we have left toyland behind us since we reached man's estate'. Let me sympathise with these feelings and own for my part a weakness for pantomimes and fireworks, which weakness I have occasionally the opportunity of indulging, on the plea of taking my children out for a treat. But let me say at once that the magic lantern is now no toy, but it is recognised as a valuable aid to education far and wide.

EDITORIAL

We are pleased to print Mike's characteristically passionate and modest statement and hope that it will encourage others to write to the *Journal* with their thoughts and feelings about lantern activities and possible directions we could consider taking. We also hope that, as he suggests, other Showpersons will offer documentation of their histories and current activities. There is indeed great scope here for material which is both of current interest and considerable future importance.

On our centre pages we begin the promised *Primus Department* with a brief glimpse at some of the firm's output. We should like to follow this up with a detailed study and would like someone with a particular interest in this area to step forward and offer his services.

We also welcome offers of services in all other departments – and will attempt, as we said previously, to find a home for all material offered.

David Henry

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Mike & Elizabeth's poster for a 1975 show, surname mis-spelt

CONVENTION PROCEEDINGS III

9th April 1983

THE HISTORY OF PROJECTING PHANTOMS, GHOSTS AND APPARITIONS Part 2

HERMANN HECHT

We have definite information of a 'camera obscura lantern' (to coin a phrase) in the 'Contrivance to make the Picture of any thing appear on a Wall', which was designed by ROBERT HOOKE, first curator of experiments to the Royal Society and later its secretary. Although details were not published until 1668, some years after its first demonstration, the Society obviously attached a great deal of importance to the instrument:

It produces Effects not onely very delightful, but to such as know the contrivance, very wonderful; so that Spectators, not well versed in Opticks, that could see the various Apparitions and Disappearances, the Motions, Changes and Actions, that may this way be represented, would readily believe them to be super-natural and miraculous... So far our Inventor; who has not contented himself with the bare speculation, but put the same in practice some years since, in the presence of several members of the R. Society, among whom the publisher had the good fortune to see the successful performance of what is here delivered.¹

I have as yet been unable to discover the exact date that Hooke demonstrated his 'contrivance' with which, in essence, three different projection methods were made possible: i) the projection of transparencies, ii) the projection of opaque objects which can be placed upside down, and iii) the projection of opaque objects, like live animals, which have to be kept upright (most seem to prefer it that way) and where the use of two lenses is suggested to re-invert the inverted image. The reference to supernatural effects may be misleading: if one attempts a reconstruction of Hooke's 'Camera Laterna', one can only come to the conclusion that it must have been an arrangement on the lines of a very large optical bench taking up an entire room – a projection booth in the true sense of the word – a very remarkable instrument for its time and far more sophisticated than the puny magic lanterns which were then just about appearing in public. It is perhaps little wonder that the Royal Society simply ignored them!

The pictures shown with these lanterns quite naturally depicted the same subject matter as had the ghost and devil shows. The first description we have is of WALGENSTEIN's lantern and dates from 1664: it comes from Paris where PETIT refers to it as 'the lantern of fear'.² Walgenstein was in Lyons in 1665 where he referred to it as his MAGIC LANTERN.³ Three hundred and a score years later we still call it that and forget that when he gave the lantern its name and called it MAGIC, he meant it to be taken literally. He was in Copenhagen in 1670 where he gave a lantern show before King FREDERICK III just a few days before the king died.⁴ A figure of Death was among the pictures shown to the Court which badly frightened those present; the King alone kept calm and asked for Death to be shown three times more – he died three days later – the first victim of the magic lantern? – I often wonder.

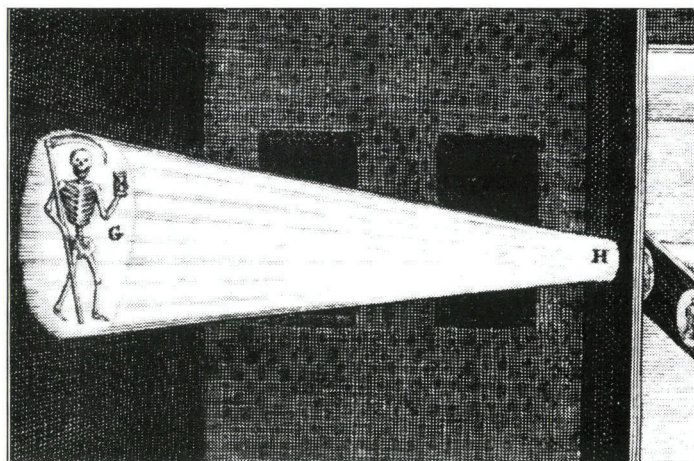
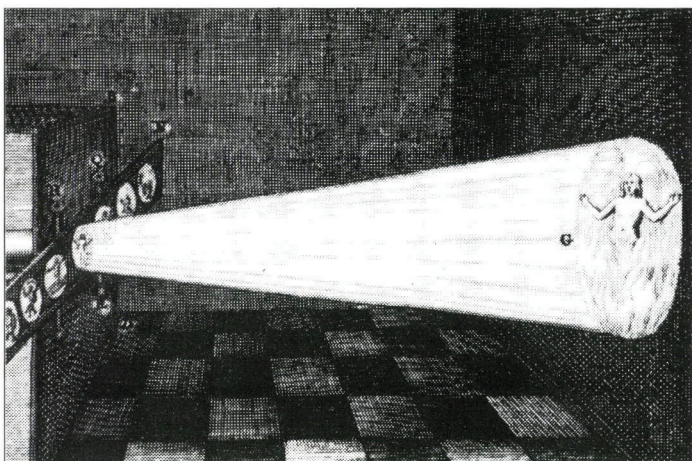
Kircher,⁵ with his quite often wrongly maligned lantern showed a poor soul in purgatory (1) – and Death with his hourglass and scythe (2). In 1696 EDWARD PHILLIPS in the third edition of his *General Dictionary* defines the 'Magick Lanthorn' as:

a small Optical Macheen, that shews by a gloomy light upon a white Wall, Spectres and Monsters so hideous that he who knows not the Secret, believes it to be perform'd by Magic Art.

In the same year DE VALLEMONT in his *La Physique Occulte* says that:

The magic lantern is an optical machine. It is called 'magic', no doubt, because of its prodigious effects and the apparitions, and horrifying monsters that it reveals, and that people who do not know of its secret attribute it to magic.⁶

In spite of pleas for enlightenment, this attitude to the magic lantern persisted: even as late as 1720 scientists like 's GRAVESANDE,⁷ who



provides a detailed description and dimensions of the lantern, still shows the devil as the projected image (3). So for that matter does an 1898 advertisement for a French toy lantern (4) almost 200 years later.

A more sinister use was made of the lantern in the eighteenth century when less scrupulous showmen used the superstitions and fears of their fellow-men to show them frightening beasts and devils. The most notorious of these was GEORG SCHRÖPFER, who was the owner of a coffee house in Leipzig.

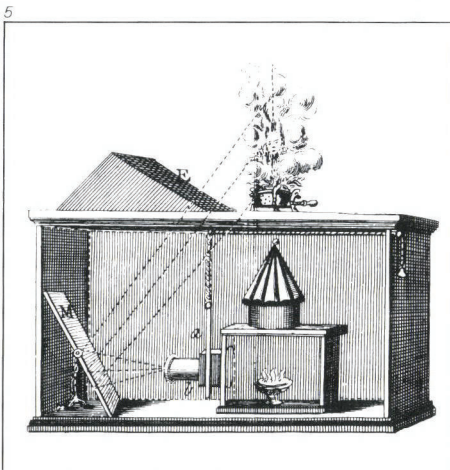
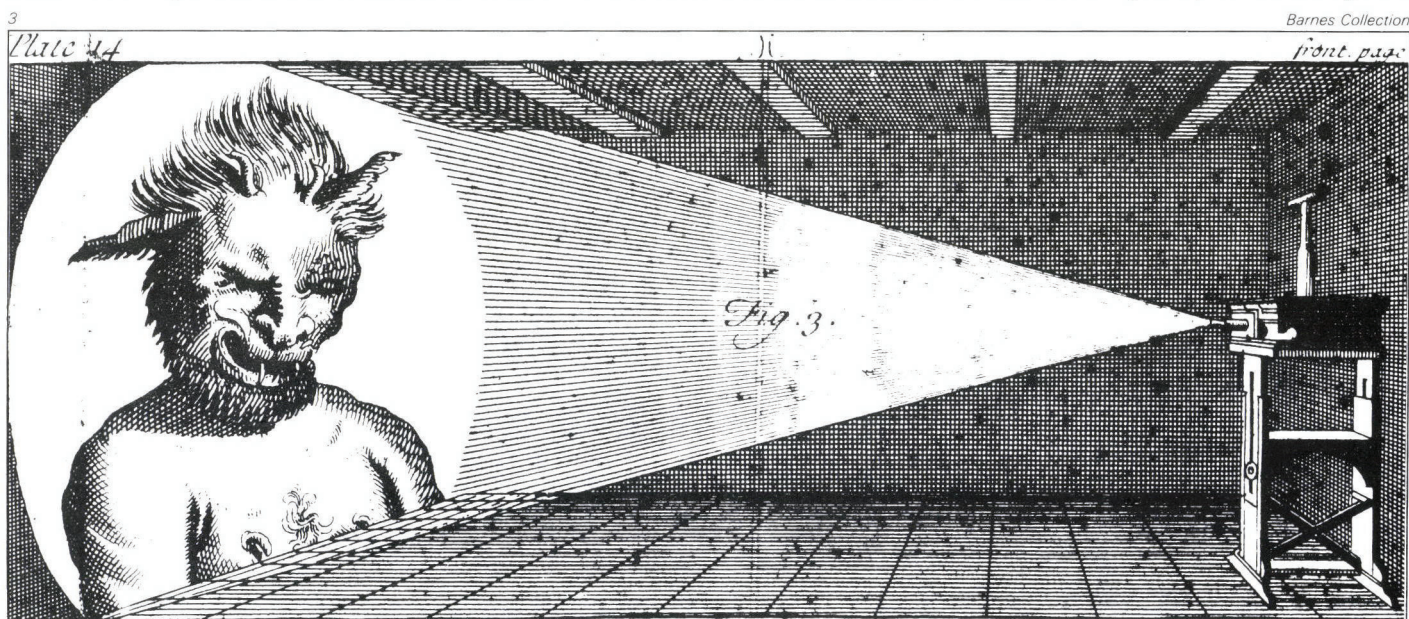
Schröpfer fitted up one of his rooms with all the paraphernalia of what he called his 'necromantic séances'. He managed to convince his followers that he could conjure up the spirits of their dead ancestors. His victims had been made amenable by making them fast for three days before they were allowed to enter the ghostly room which contained nothing but an altar, a skull, and a

single candle. Schröpfer, just like Cellini's Sicilian priest, drew a magic circle in the sand on the floor which no one, on the fear of instant death, was allowed to enter. And now the conjuration began: suddenly the light went out and the spirit of the dead appeared above the altar, accompanied by an uproar of ghostly noises. Schröpfer attacked the ghost with a dagger to force him to talk and the ghost duly obliged, first howling miserably and then answering all the questions put to him in a terrifying and rough voice. At last the ghost vanished amidst a new tumult of clattering and banging.⁸

It was of course all done by back-projecting the image of the ghost on to smoke and by having hidden assistants speak and yell through pipes which ended inside the altar. We can only guess what that room looked like by comparing the descriptions published in the 1770s and 1780s. The earliest I have been able to find is that of

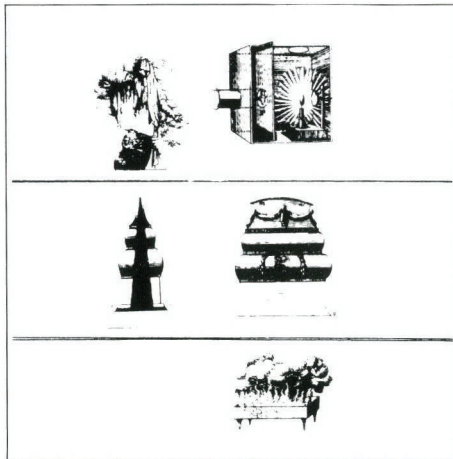
EDME GILLES GUYOT of 1770 in his *Nouvelles récréations mathématiques* where he describes the projection of spectres on to smoke. In 1774, Hooper's *Rational recreations* was published which was a virtual translation of Guyot's book. In this the 'nebulous magic lantern' is described and how 'to produce a phantom up-on a pedestal in the middle of a table' (5). Here the lantern is contained in a box which has a mirror attached to it at 45 degrees to reflect the ghost on to the smoke which is produced by burning incense in a little pan on top of the box. There is also usually some simple mechanism, which is not shown too clearly in this illustration, to move the slide inside the lantern. These lanterns could be bought well into the nineteenth century: figure 6 is a Victorian illustration of the same thing meant to educate the young rather than to frighten them.

So by the early 1770s these methods were common knowledge and professional magicians

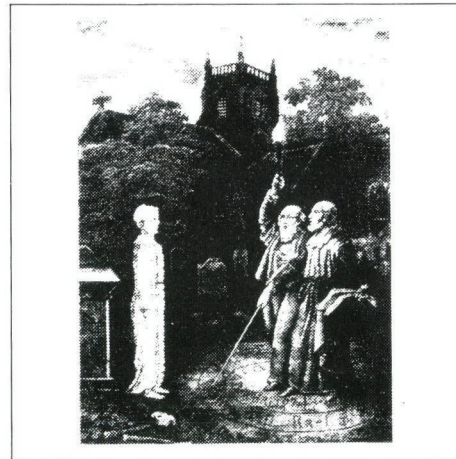




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8



9

like the American JACOB PHILADELPHIA, (7) whose real name was Jacob Meyer, but who thought it best to change it when he came to Europe – and who can blame him? – by adopting the name of his birthplace, used them as part of their conjuring shows. Philadelphia surrounded his magic lantern séances with a heavy aura of mysticism and pseudo-scientific mumbo-jumbo; his ghost projections on billowing clouds of smoke were so terrifying that this part of his performance was banned in Vienna.

We have very good engravings to show what the paraphernalia used for these ghost shows looked like (8): they date from 1794 and were published in Krünitz's *Encyclopaedia*.⁹ They clearly show how the ghost was projected: the smoke is produced by burning small pieces of tar in a pan hidden in the bottom of a specially constructed sarcophagus which has a long narrow aperture at the top. The slide on which the ghost is painted, surrounded by black, is pushed down inside the hidden lantern and the image is projected on to the smoke. All the onlooker sees is a ghost gradually rising from the coffin.

As the century progressed it was only natural that these ghost-shows should become more sophisticated and in 1792 Halle in his book on natural magic¹⁰ published details of complex mechanisms

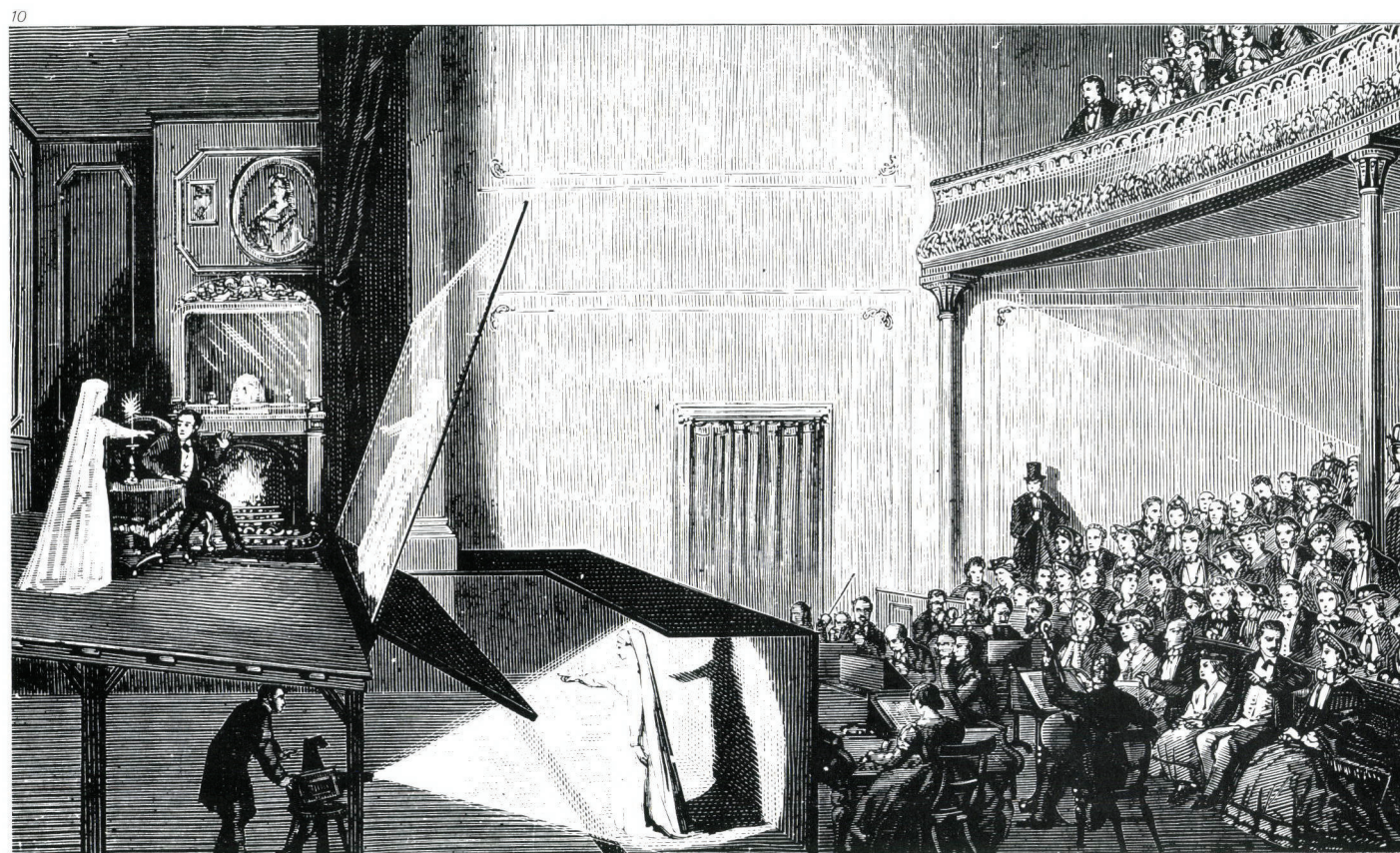
where the slides are set into the periphery of a geared wheel which is secretly turned by means of a long rod manipulated from another room. (This is the first system of transparencies being made to revolve mechanically and in sequence). Halle also explains two methods of how to project the images of ghosts on a churchyard wall (9) and how to make the spirits rise up from their graves. Another trick was to project the slide on to a concave mirror with a magic lantern and make the image appear to be floating in the air; a combination of the old art of mirror projection and magic lantern projection.

The ultimate improvement was to replace the magic lantern picture with a living person dressed up as a ghost and project this moving image, by means of a combination of plane and concave mirrors, to the lantern. Lantern is really quite the wrong term: it is only the lens system that is used and there is no light source or slide. The arrangement is a sort of universal camera obscura/magic lantern/mirror projection system which needed a sophisticated showman and quite a lot of initial investment to present it and to make it work.

One of the showmen who used this ingenious method was JOHANN CARL ENSLEN who first appeared about 1785 in London at the Lyceum in the Strand where he exhibited his 'Beautiful transparent Air Figures' which included 'a majestic

figure of the goddess Dianah'. He also performed at the Pantheon in Oxford Street (now the site of one of Marks & Spencers' stores) and before that in Paris.¹¹ In Berlin, he and his brother had their own 'Philosophical Theatre' where they exhibited their 'living ghosts' (if this isn't a contradiction in terms). ENSLEN gave a performance before *The Society of the Friends of Natural Science*, and magic had acquired the right degree of respectability, sanctified no doubt, when the King of Prussia attended a performance in 1796 and a choir sang 'Hail! Hail thee our lord and Master' to accompany a magic lantern picture of His Majesty.¹² Enslen not only used magic lantern/concave mirror projection, back projection with a movable lantern, and a primitive form of dissolving views, but also concave mirror effects where, as in Pepper's Ghost (10), live actors dressed up as ghosts performed their antics in a pit below the stage.

In 1789 a showman named PHILIDORE appeared in Berlin showing his ghosts and spectres with 'a solemn and mysterious fervour'. But, alas, his tricks were exposed as a total fiasco and it was proven that he used a magic lantern and slides made of paper which had been soaked in oil.¹³ In 1790, regardless of the reputation he had earned in Berlin, he scared the inhabitants of Vienna with the same show and two years later he went to



10

Paris and did much the same there. His only reason, he said, was to uncover the secrets of the 'Secte des Illuminées'.¹⁴

When ROBERTSON started his Phantasmagoria with pomp and circumstance in Paris (11), there was really very little that had not been done by magicians and showmen all over Europe for many decades. Although Robertson was without doubt the greatest of them all and, if on hindsight we know that not everything he did was original, the eerie atmosphere of his phantasmagoria room, the sound effects which prepared the spectator for the chilling results produced by his performances – the consummate professionalism of his magic lantern shows – remain unsurpassed.

Robertson claimed to have started his Phantasmagoria while still at Liège (where he was born) and that they were not only his 'path to fame and fortune' but also his 'destiny'. In March 1789 he opened his first phantasmagoria room at the Pavillon de l'Echiquier and in his prospectus he said that the Phantasmagoria were a plea for enlightenment and intended to 'lift the iron curtain which has so long obscured the truth'. (When I wrote a letter to the editor of *The Times* trying to tell him that this was the first time the expression *iron curtain* had been used, he took not the slightest notice.)

Among the various laudatory articles which appeared at that time was one by POULTIER-DELMOTTE who was then editor of *L'Ami des Lois*. Robertson, with his usual paranoia later said that because of the article the secret police searched all his papers and boxes to look for ghosts and his exhibition had to close down. True or not, the article was full of Revolutionary in-jokes (if you accept the premise that as long as everybody around you loses his head you might as well keep your own and enjoy it) and although it presented a highly coloured version of the truth, although exaggerated and 'embroidered with imagination', even this extract provides an excellent contemporary view of the phantasmagoria:

On the 24th March 1789 I found myself with about 60 others in a well-lighted apartment at no. 18 Pavillon de l'Echiquier.

At precisely 7 o'clock a pale, gaunt man entered the apartment where we were; after having ex-

tinguished the candles, he said: 'Citizens and gentlemen, I am neither one of those shameless adventurers nor one of those impudent charlatans who make endless promises which they cannot keep. I have been assured by the *Journal de Paris* that I have resuscitated the dead, and that I will bring them back to life. Those in the company who desire the apparition of persons whom they have held dear and whose life was terminated through illness or in some other respects, now is their time to speak: I obey their command!'

Then followed a great silence; whereupon a man in confusion with bristling hair... said that he wanted to see the spirit of Marat. Robertson poured two glasses of blood, a bottle of vitriol, a dozen drops of aqua fortis and two copies of the *Journal des Hommes-Libres* on a flaming brazier. Instantly, little-by-little, a small, hideous and livid phantom armed with a dagger, his head adorned with the red cap of liberty appeared; the man recognised him as Marat and wanted to embrace him; the phantom grimaced horribly and vanished. '...Citizens and gentlemen', Robertson said, 'so far I did not want you to see more than one spirit at a time; my art is not limited to such triviality – this is no more than a prelude to the *savoir-faire* of your servant. I will now present to you, salutary gentlemen, the multitude of spirits, whoever they may be, who during their lifetime have received of their generosity, conversely, I will present in review, evil spirits of the victims of their deeds.' Then he declaimed with emphasis the magic words: 'conspirator', 'humanity', 'terrorist', 'justice', 'revolutionary', 'alarmist', 'monopolist', 'moderate', 'peace' and 'public salvation' and immediately one saw groups of spirits covered with blood-stained shrouds rise up. They surrounded and crowded round some individuals who had refused to give in to the general acclaim and who, afraid of this terrible spectacle, hurriedly left the auditorium, yelling in terror.

The séance was finished apart from a royalist insurgent who was now employed in a slaughter-house of the republic; he asked Robertson whether he could make Louis XVI appear. At this indiscrete question the phantasmagorist replied sensibly: 'I had a recipe for this sort of thing before the Revolution but I have now lost it. It is probable that I cannot ever find it again, and it is

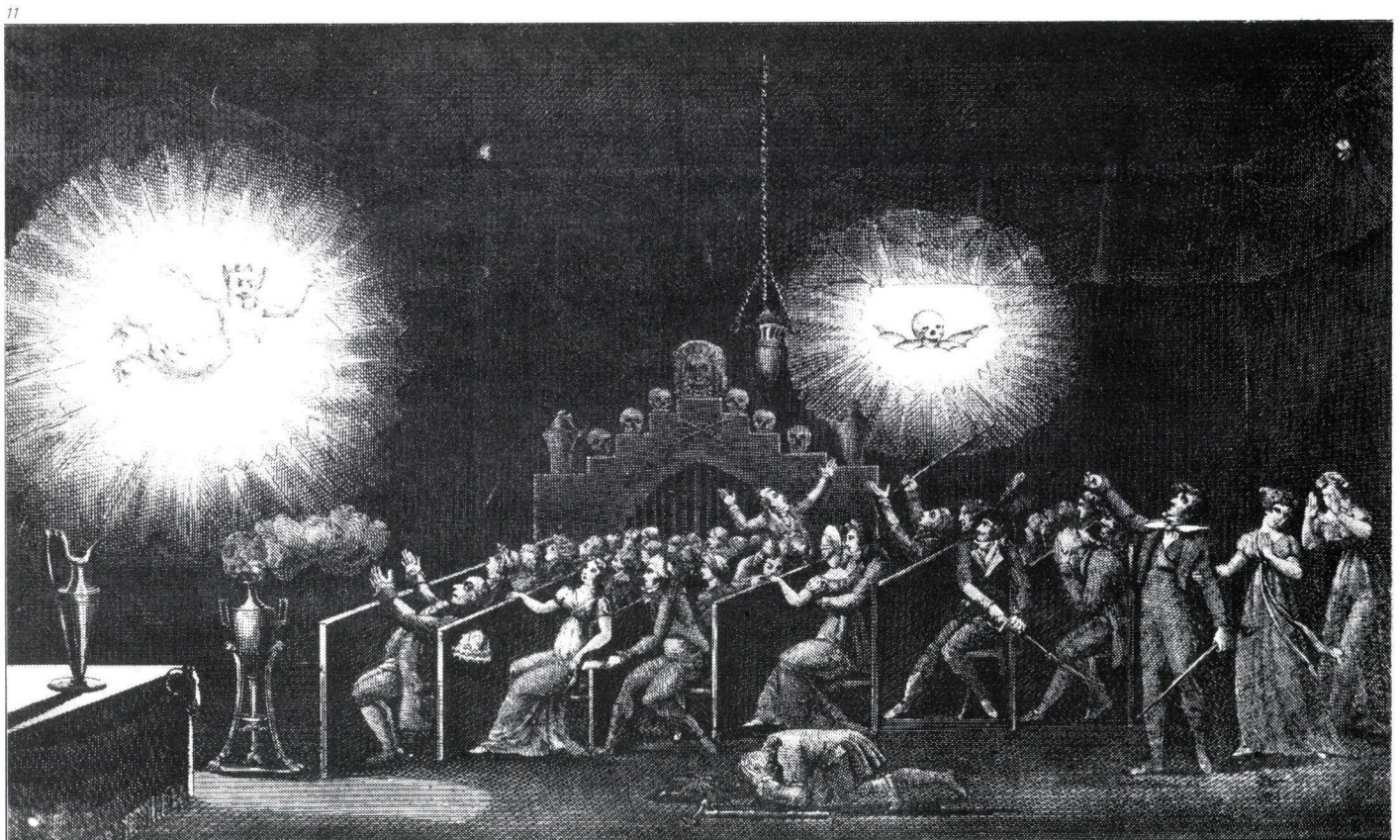
therefore henceforth impossible to bring back the Kings of France.'¹⁵

In March or April 1799 Robertson re-opened his Phantasmagoria at the old Capuchin Convent which, with its gardens, had become a favourite place of amusement after the Revolution and reported that they had a 'prodigious effect' on the audience who rushed to attend these 'sepulchral distractions'. Among the many was the Empress Josephine who came with a company of top revolutionaries who had booked an entire performance.

When Robertson took his Phantasmagoria to Russia, he gave performances before the Tsar and his family 'to the general satisfaction of the audience', as he modestly puts it. The Nobles, he says, sent their servants, their 'slaves', to the phantasmagoria to see whether they would return alive, and then came themselves, only after having reassured themselves and first risking their *muzhiks*. In St Petersburg Prince Brobinsky (the illegitimate son of Catharine II and Orlov) intensely annoyed and infuriated Robertson by performing his own phantasmagoria to which Robertson was not invited!¹⁶

Although Robertson performed in most countries of Europe, he never came to England. For the simple reason that while he was touring the Continent, PHILIPSTHAL had already established himself in London.

When PAUL DE PHILIPSTHAL brought his phantasmagoria to the Lyceum in the Strand late in 1801, he took out a patent for what we know now to have been common knowledge among the showmen of Europe.¹⁷ Where Philipsthal came from nobody seems to know; some say he came from Germany and that he spoke with a heavy German accent, others say he came from France and got him mixed up with Robertson. Further research may well establish that PHILADELPHIA, PHILIDOR and PHILIPSTHAL were all one and the same and that if this is so, he was born in Philadelphia of Jewish parents who had emigrated there in the eighteenth century from Europe. It seems just too much of a coincidence that the names of three of the best-known ghost-showmen in Europe should all start with PHIL..., although all three may well have traded on each others' names.





PHANTASMAGORIA

THIS and every EVENING,
AT THE
LYCEUM, STRAND.

12

Before I quote part of Philipsthal's playbill – figure 12 is the illustration from it – let me remind you that phantasmagoria were only part of his performance which also included two elegant rope dancers, a mechanical peacock, and (believe it or not) a beautiful female Cossack enclosed in a small box.

The OPTICAL PART of the Exhibition

Will introduce the Phantoms or Apparitions of the DEAD or ABSENT, in a way more compleately illusive than has ever been offered to the Eye in a public Theatre, as the Objects freely originate in the Air, and unfold themselves under various Forms and Sizes, such as Imagination alone has hitherto painted them, occasionally assuming the Figure and most perfect Resemblance of the Heroes and other distinguished Characters of past and present Times.

This SPECTROLOGY, which professes to expose the Practices of artful Impostors and pretended Exorcists, and to open the Eyes of those who still foster an absurd Belief in Ghosts or Disembodied Spirits, will, it is presumed, afford also to the Spectator an interesting and pleasing Entertainment; and in order to render these Apparitions more interesting, they will be introduced during the Progress of a tremendous Thunder Storm, accompanied with vivid Lightning, Hail, Wind, &c.

Phantasmagoria shows sprang up everywhere: in London where the Lyceum Theatre became their spiritual home (that's a pun!), in the provinces and in Ireland. Their success was not only due to the expertise and dexterity of the magic lantern showmen; they also catered for the public taste for the tales of horror, with their elements of gloomy ghosts and the supernatural, which reached the height of their popularity about that time.

This preoccupation with the miraculous power of nature and man is no doubt also reflected in the reworking by the German poet GOETHE of the Faust legend. The first scenes were written in the heyday of the ghost-séances, between 1772 and



13

1775, before Goethe settled in Weimar. In one of the first private performances of his Faust at Monbijou in 1819 phantasmagoria effects were used to show the appearance of the 'Earth-Spirit'.¹⁸ The scene as finally written shows Faust impetuously turning the leaves of a book written by Nostradamus and coming across the sign of the 'Earth-Spirit' he declaims:

The moon conceals the light –
The lamp's extinguished!

Mists rise – red, angry rays are darting
Around my head! There falls
A horror from the vaulted roof,
And seizes me!

I feel thy presence, Spirit I invoke!
Reveal thyself!

Ha! in my heart what rending stroke!

With new impulsion

My senses have in this convulsion!

I feel thee draw my heart, absorb, exhaust me:
Thou must! thou must! and though my life it
costs me!¹⁹

Faust dares the unthinkable and pronounces the sign of the Spirit who appears amid a red and ruddy flame to ask 'Who calls me?' (An obvious question, but not altogether irrelevant in the circumstances.)

An earlier pencil sketch drawn by Goethe between 1810 and 1812 has survived and shows how he envisaged the scene (13). It is of course ideal phantasmagoria material. He approached the painter WILHELM JOHANN CARL ZAHN and enquired where he could obtain a lantern – and how much it would cost – to show these effects which he wanted to use again for the first performance in Weimar in 1829; in his letter he speaks of back-projecting a head, first small and growing in size and appearing to come closer.²⁰

In a comparatively short time we have come a long way from the heady days when the Empress of France, the Tsar of the Russian Empire and the King of Prussia came to see the phantasmagoria.

The professionals, like their slides, slowly faded away and the ghosts managed to invade the homes of the well-to-do. The middle-aged might nostalgically think of the good old days at the Lyceum when ghosts really were ghosts, but the young had to make do with a smoky lantern and slides whose imagery is evoked so vividly by CHARLES DICKENS:

Tackleton the Toy-merchant... had even lost money... by getting up Goblin slides for magic-lanterns, whereon the Powers of Darkness were depicted as a sort of supernatural shell-fish, with human faces. In intensifying the portraiture of Giants, he had sunk quite a little capital; and, though no painter himself, he could indicate, for the instruction of his artists, with a piece of chalk, a certain furtive leer for the countenances of those monsters, that was safe to destroy the peace of mind of any young gentleman between the ages of six and eleven, for the whole Christmas or Midsummer Vacation.²¹

While in Europe the ghost shows had long since vanished, in Japan the ancient stories of noble Samurai conquering evil spirits still formed ideal material for ghost projection and phantasmagoria shows.

LAFACARDIO HEARN, an American journalist of Greek-Irish parents who became a naturalised Japanese and wrote with considerable enthusiasm about things Japanese, in the early 1890s described a visit to a kind of fair held in the precincts of a temple.²² Among the fortune tellers, jugglers, a menagerie, and the toy-stalls was a building which held a Japanese magic lantern show in which a number of different projection ghost-plays were performed. Hearn only stayed to see one, in three scenes, of which he gives this synopsis:

Scene I

A beautiful peasant girl has been selected as victim of a 'bad god' to be eaten by him; unless she complies, the crops and cows will be destroyed.

Scene II

A box containing the girl is carried by two coolies to the temple and a Samurai, hearing the story, declares the so-called god to be a devil and takes the place of the girl in the box.

Scene III

Outside the temple the coolies drop the box and run away. A veiled figure reveals its face: 'a skull with phosphoric eyes', and opens the box. The Samurai wrestles with the ghost and cuts off his head. 'Head suddenly enlarges, grows to the size of a house, tries to bite off head of Samurai. Samurai slashes it with his sword. Head rolls backward spitting fire and vanishes. *Finis. Exeunt omnes.*'

This then is the final postscript to the centuries-old story of the projection of ghosts and phantoms. *Finis* and *exeunt omnes* to the multitude of spirits! Thank you all for listening to me so patiently; my thanks to Ernest Jones for doing the marvellous readings and to Ann for working the lantern.

Hermann Hecht

NOTES

- ¹ *Philosophical Transactions*, London: 17 August 1668, vol 3, pp 741-743.
- ² A letter from Pierre Petit to Christiaan Huygens. See: *Oeuvres complètes de Christiaan Huygens publiées par la Société Hollandaise des Sciences*, 1888-1950, The Hague: Martin Nijhoff, vol 4, pp 261 ff and vol 13, p 161.
- ³ Milliet Dechaies, Claude Francois, *Cursus seu mundus mathematicus*, 1674, Lyons: Ex officina Anissoniana, vol 2, p 655.
- ⁴ Jacobaeus, Oligerus, *Muséum Regium*, 1691, Copenhagen: Joachim Schmetgen, part II, sect IV, p 67.
- ⁵ Kircher, Athanasius, *Ars magna lucis et umbrae*, 1671, Amsterdam: Joannem Janssonium, pp 768 and 769.
- ⁶ See: Morris, R. G., 'The magic lantern in 1693', *The New Magic Lantern Journal*, London, 1978, vol 1, no 1, p 3.
- ⁷ 's Gravesande, Willem Jacob Storm van, *Physices elementa mathematica*, 1720-1721, Leyden: Petrum Vander; see: 'De Lucerna Magica', vol 2, pp 72 ff and plate 14. The illustration reproduced here (3) is taken from the English edition of 's Gravesande's *Mathematical Elements of Natural Philosophy*, vol 2, p 100, plate 14, figure 3.
- ⁸ The information about Schröpper is taken from various sources; the first mention is said to be in: Funk, Christlieb Benedikt, *Natürliche Magie*, 1783, Berlin, which I have not seen.
- ⁹ Krünitz, Johann Georg, *Oekonomisch-technologische Encyclopädie*, 1787-1858, Berlin: Joachim Pauli, vol 65, plates 16-20.
- ¹⁰ Halle, Johann Samuel, *Fortgesetzte Magie*, 1788-1801, Berlin and Vienna, vol 4, 1792, p 1 and plates III & IV. Illustration 9 is not from Halle but from *The Astrologer of the Nineteenth Century*, 1825.
- ¹¹ *Grand and wonderful exhibition at the Lyceum in the Strand*, etc. An announcement bill in the British Library, shelf no. 1850. c. 10 (153), dated in author index '1785' and stamped '5 OC 59'.
- ¹² Ranke, Winfried in Detlev Hoffmann and Almut Junker, *Laterna Magica*, 1982, Berlin: Frolich & Kaufmann, pp 28-30.
- ¹³ *Ibid.* pp 20-21.
- ¹⁴ Montucla, Jean Étienne, *Histoire des mathématiques*, 1799-1802, Paris: Henri Agasse, vol 3, 1802, pp 551 ff.
- ¹⁵ Poultrie Delmotte, Francois Martin, 'Fantasmagorie', *L'Ami des Lois*, Paris, 8 germinal an vi (28 March 1798).
- ¹⁶ Most of the information is from Robertson, Étienne Gaspard, *Mémoires récréatifs scientifiques et anecdotiques*, 1831 and 1833, Paris: Librairie de Wurtz.
- ¹⁷ Patent of 26 January 1802. Printed in: *The Repertory of Arts and Manufactures*, London, 1802, pp 303-305. See also: Hecht, Hermann, 'Some English magic lantern patents', *The New Magic Lantern Journal*, London, 1982, vol 2, no 2, p 2.
- ¹⁸ Mildnerberger, Marianne, *Film und Projektion auf der Bühne*, 1961, Emsdetten: Verlag Lechte, pp 10-12.
- ¹⁹ From the translation by Bayard Taylor, 1974, London: Sphere Books, p 30.
- ²⁰ Goethe, Johann Wolfgang von, *Werke*, Herausgegeben im Auftrage der Grossherzogin Sophie von Sachsen (the so-called Sophien Ausgabe) 1887-1918, Weimar, vol 45, pp 97 ff.
- ²¹ Dickens, Charles, *The Cricket on the Hearth*, (first published 1845), Penguin English Library ed: The Christmas Books, Volume 2, 1971, Harmondsworth: Penguin Books, pp 41-42.
- ²² Hearn, Lafcardio, *Glimpses of unfamiliar Japan*, 1894, Boston and New York: Houghton, Mifflin & Co., vol 2, pp 646-647.