

# A Brief History of the Lantern

Compiled by the editor from *The Book of the Lantern* by T.C. Hepworth and Pepper's *Cyclopaedia of Science*.

This brief history is intended simply as an outline to the principal developments that took place in the development of the magic lantern from its first record in literature to its demise at the end of the nineteenth century. It is hoped that in future issues we shall be able to concentrate on items 'in-depth' as the Lantern Society's research programme starts to produce results.

## The construction of the lantern

In that wonderful autobiography of Benvenuto Cellini, which Horace Walpole described as being 'more amusing than any novel', we find the account of a weird incantation scene which took place in the Colosseum at Rome. Cellini tells us that he had made the acquaintance of a Sicilian priest who volunteered to initiate him into some of the secrets of necromancy. A meeting was appointed at the Colosseum, where 'the priest, having arrayed himself in necromancer's robes, began to describe circles on the earth with the finest ceremonies that can be imagined. I must say that he made us bring precious perfumes and fire, and also drugs of fetid odour. When the preliminaries were completed, he made the entrance into the circle; and taking us by the hand, introduced us one by one inside it. Then he assigned our several functions: to the necromancer, his comrade, he gave the pentacle to hold; the other two of us had to look after the fire and the perfumes; and then he began his incantations. This lasted more than an hour and a half, when several legions appeared, and the Colosseum was all full of devils.' It has been suggested that these effects were produced by some form of lantern casting images on the smoke from the burning drugs. Should this surmise be correct, it would refer the use of the instrument back to the early half of the sixteenth century — Cellini having been born at Florence in the year 1500 — and the event spoken of having occurred in his early manhood.

But on careful perusal of the entire account of these supernatural wonders, I feel convinced that no kind of optical instrument can have been used. To produce any remarkable effect in such a large space as that covered by Vespasian's Amphitheatre would certainly tax the powers of the best modern lantern. Besides which, Cellini was a remarkably clever and observant man, and would probably have detected the employment of any such apparatus. It is far more probable that the priest was aided by a number of confederates, and that these were in reality the legions of devils which so impressed the superstitious mind of the Florentine goldsmith and sculptor. With far more reason might we suspect the use of the lantern in those manifestations which are said to take place among the so-called spiritualists and their mediums of today.

We are certainly on much firmer ground when we ascribe the first conception of the instrument to Athanasius Kircher, the learned Jesuit of the seventeenth century, who has left so many volumes to testify to the great gifts which he possessed. For in one of these books, *Ars Magna Lucis et Umbræ*, we not only find descriptions and diagrams of numerous optical contrivances (I may note in passing that many of these drawings, redressed and elaborated, appear in modern text-books as new ideas), but several which show that Kircher quite understood the main principle upon which the optical lantern depends. A tracing of one of these rude cuts is given at fig. 1,

from which it will be seen that the design to be projected by the lens is illuminated by three candles — the brightest form of artificial light then known — and an inverted image is thrown upon a screen at a distance.

Here we have practically the germ of the aphegescope, or opaque form of lantern. But modern writers on the subject, in referring to Kircher, have curiously overlooked this most suggestive drawing, and have given another one from his book, which they erroneously describe as the first form of magic lantern. This I also reproduce (see fig. 2). The description appended to the cut certainly does not bear out that view, but points rather to a means of increasing the light from any lantern by using a parabolic reflector behind the lamp or candle flame. The passage (translated) runs as follows:

'To construct an ingenious lantern which may show things written at a great distance so that they can be read.

'Let a lantern be made of the same cylindrical figure as you see here represented, in whose base let a concave mirror be placed, having as parabolic a shape as is possible. Within the focus of this mirror let F, the flame of a candle, be fixed, and you will have what is required, for it will shine with such unwonted splendour as to show by night, without any trouble, even the smallest letters when examined by the aid of a telescope. But persons looking at the flame from a distance will think that it is a great fire. If the inner sides of the cylinder are fashioned of polished tin in the form of an ellipse, they will increase the light. But the figure here given will sufficiently show the invention. E marks the handle and the opening (or window); C the chimney or funnel.'

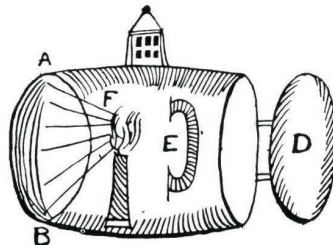
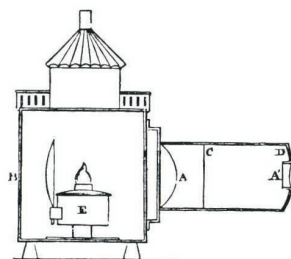


FIG. 2.

It is worthy of note that Sir David Brewster, in his 'Natural Magic', quotes the incantation scene from Cellini at length, and states his conviction that the appearances were brought about by optical apparatus, although he admits that little was known of the action of mirrors and lenses until the time of Kircher.

It is obvious, however, that such primitive instruments were of the crudest kind, and can only be regarded as interesting curiosities. Up to within quite recent times lanterns for projection held about the same relation to the modern instrument as does the bone needle of the cave men to the sewing machine. Like most instruments of precision, the optical lantern is the outcome of many years of patient thought and labour, and is the result of the working of many minds. No individual can be credited with its invention or discovery. The crude idea is, as we have seen, to be found in Kircher's book, and one improvement has been suggested here, and another there, until we have before us a very perfect optical appliance.



B. the box; C. the lamp and reflector; A. the plano-convex lens; C' the tube sliding within the first tube, and containing a double-convex lens, A'.

The gradual advance in the instrument very naturally follows the introduction of improved illuminants for more general purposes. The oil lamp was superseded by the argand gas-burner, and this was in its turn supplanted by the whiter and better light afforded by mineral oil, while before this, for the better kind of lanterns, Lieutenant Drummond's brilliant limelight was quickly adopted as the best for the purpose. This, too, may possibly, in the near future, give way to the still more brilliant electric arc light. But the introduction of mineral oil, in conjunction with the adaptation of photography to lantern pictures, have been the main factors in giving the instrument its present popularity.

The first lantern burning mineral oil, and called the *Sciopticon*, came to us from America. It was constructed on scientific principles, and was far in advance of anything of the kind before produced. It possessed good lenses and a powerful lamp, the two broad wicks of which were placed edgewise towards the condenser. The lamp was so closed in that it formed a combustion chamber, and burnt the oil under the best conditions. The lantern, however, had its faults. The front glass of the lamp was apt to break, and a dark vertical line was always seen upon the sheet — a line which was in reality the image of the dark space between the two wicks. By adding a central wick, and by making certain alterations in the ventilation of the lamp chamber, Messrs. Newton conquered both these difficulties, and a far more perfect form of lantern has been the result. The same makers have, too, made the lamp distinct and separate from the lantern, so that, if required, it can readily be removed, and a lime-jet used in its stead. The form of lamp referred to is shown in fig. 3, both open for trimming and closed as in use, while a complete mineral oil lantern, of the kind now adopted by

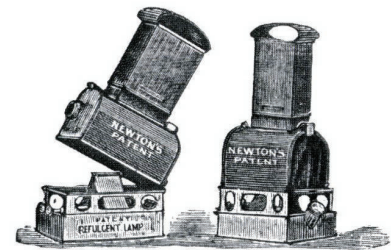


Fig. 3.

most makers, is seen at fig. 4. The management of oil lanterns is so simple, really resolving itself into the necessity for keeping the burning wicks at a correct height, and putting the slides or pictures on the stage provided for them, that no more space need be devoted to this portion of my subject.

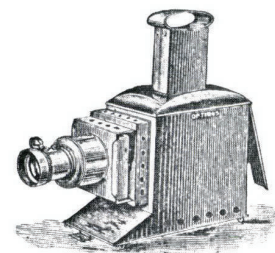


Fig. 4.

The great advantage of using a pair of lanterns is that whilst a picture is being shown by one, another picture is being made ready in the other, and there is no pause or blank screen when the change is made. The so-called dissolving views, which are produced by making this change slowly, made a great sensation when they were first introduced, perhaps because few know exactly how they were managed. But they are now so common that many persons consider them rather tiresome than otherwise. Still, they give the operator a ready means of varying his work, if the dissolving apparatus be used with judgement. Thus most beautiful effects can be obtained in landscapes, more especially in seascapes, by using photographic cloud pictures, the gradual blending on one clouded sky into another giving fine aerial and very natural



results. In one set of pictures which I prepared to demonstrate the beauties of cloudland, in connexion with a lecture on ballooning, a sunrise picture was made to melt into a sunset picture, and in due time this latter gave place to a moonlight effect. I am convinced that much can be done in this direction if time can be given to the preparation of the pictures.

Originally for such effects two separate lanterns were used side by side, but now a biunial lantern, with one optical system above the other, is employed (see fig. 5). The modern arrangement is far more convenient for the operator, for the apparatus is compact and every adjustment is within easy reach of his hand.

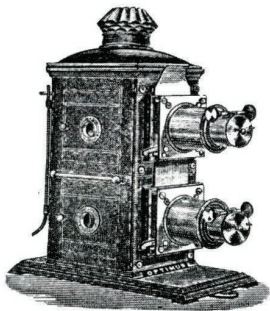
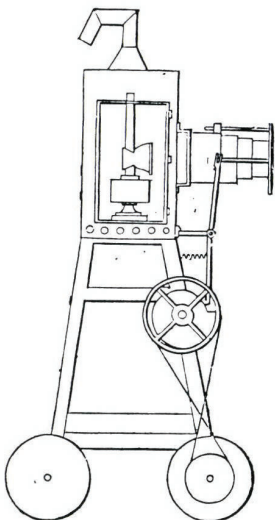


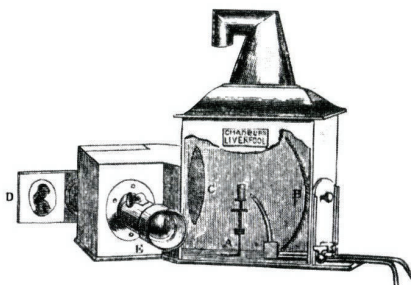
Fig. 5.

The dissolving view arrangement, long kept a secret by Mr. Child, the inventor, is nothing more than two magic lanterns placed side by side, and provided with sliding plates so arranged that, as one picture is gradually cut off, the second is disclosed, and by alternately throwing on one picture and cutting off the other, the most pleasing effects are obtained, provided the two lanterns are precisely similar. To save gas, it is sometimes usual to turn off the oxygen from one lantern and to supply it to the other, and thus by alternately raising and lowering the lights in the lanterns the same result is obtained.

The phantasmagorical effects first ascribed to Cellini are produced by painting in the figure-picture on glass, and then blackening out the whole of the ground, and — either by carrying the lantern and moving backwards and forwards behind the sheet, or by a mechanical arrangement in which the lantern runs on a tramway, and is focused as it approaches or recedes from the transparent disc — the pictures are made to increase or diminish at pleasure. In practice it is better to allow the lantern and person showing it to be carried on the same carriage, as the lever arrangement, attached to the focusing lenses, is very apt to get out of order.

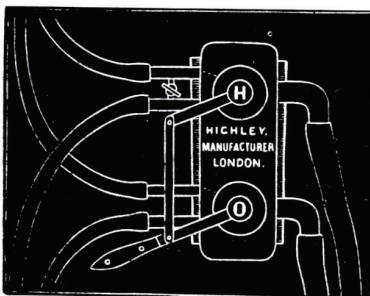


One of the most useful instruments for public exhibitions is that designed by Messrs. Chadburn, of 71 Lord Street, Liverpool, for the purpose of producing enlarged images upon a screen (similar to those of the magic lantern) from *opaque objects*, such as photographs, *cartes de visite*, engravings, drawings, reliefs, natural objects in all their colours, mechanical apparatus, or delicate mechanism in motion, such as the various parts of a watch or, still better, of a repeating watch. The instrument is simple in its construction, and consists of a lantern box, containing in the centre a pillar with adjusting screw, upon which the lime cylinder is placed; behind it the metallic reflector, which must be so adjusted that the picture is evenly illuminated. The reflector can be raised or lowered, or moved backwards and forwards.

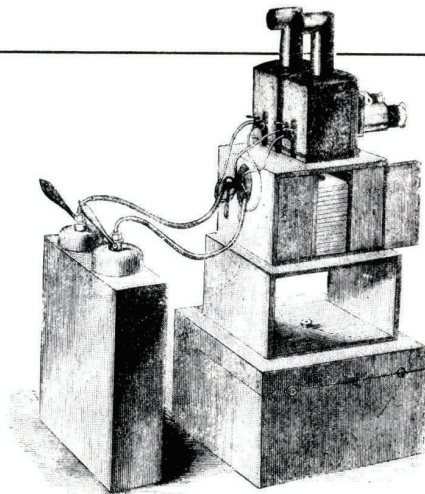


Part Section and Elevation of Chadburn's Lantern.  
A. the light; B. reflector; C. condensing lens;  
D. the picture; E. the achromatic focusing lenses.

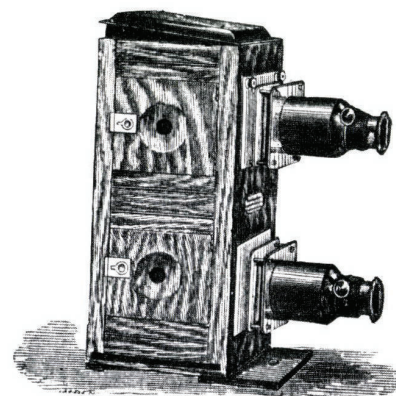
In 1857 the writer introduced at the Polytechnic photographs of original drawings made by Mr. George Hine, the distinguished artist. The whole of the pictures illustrating the amusing story of Blue Beard were done in this way, and were most effective and successful, as every touch of the original artist is thus delineated in the photograph and subsequently thrown on the screen. Messrs. Negretti and Zambra followed up the idea by using photographs of statuary, which they displayed at Manchester with astonishing success, the Mechanics' Institution there realizing something like £600 by the exhibition in a few months. Mr. Highley has continued in the same track, and deserves notice for the admirable photographs of natural objects which he prepared for the dissolving-view apparatus — his arrangement of the latter contrivance, is good and convenient. The arrangement for saving oxygen gas is also extremely useful where the gas cannot be obtained easily. Portability and economy of space have all been carefully studied in Highley where the gases (oxygen or hydrogen) are condensed in separate strong copper cylinders which pack in one box, and the lantern, the slides, and the stand upon which they are placed, come out of and belong to the second box.



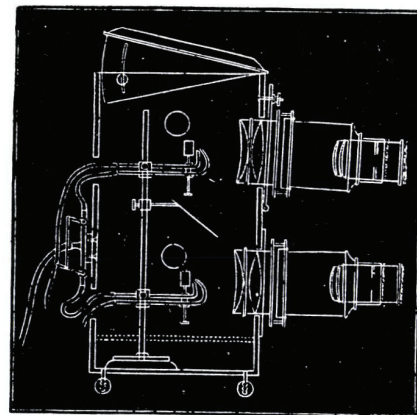
Arrangement for saving oxygen gas, which is supplied alternately to one limelight and then to the other.



Highley's complete Apparatus for Dissolving Views, all packed in two boxes.



Improved Dissolving View Apparatus by Highley, 10A Great Portland Street.



Section of Highley's Dissolving View Apparatus

