

In casting around for a really efficient and eminently authoritative writer to prepare a series of explanations and descriptions of the many and various optical illusions, which have puzzled and amused the great public the world over during the last century, the Editorial eye fell with instinctive assurance upon the writer, who has filled the following pages with valuable and exact information and diagrams which are not only given by one who understands his subject thoroughly, but was to a considerable extent intimately connected with the scene of "Pepper's Ghost" and its successors, being attached to the Polytechnic Institute, which was the scene of many extraordinary illusions, of which the "Pepper's Ghost" illusion was one of the most sensational and successful.

Mr. Edmund H. Wilkie is so well known to the majority of our readers, that it is unnecessary for us to do more than congratulate ourselves upon having induced so excellent and amusing a writer to allow his knowledge of the subject—or a small portion of it—to be put at the disposal of our readers.

With this small introduction let us at once retire in favour of Mr. Wilkie and allow him to enter upon his subject without delay.—Ed.

Ten years is said to be the length of one generation, and as the generation which generously accorded so flattering a reception to my first series of these articles has advanced ten steps along the path of time, presumably leaving a younger one in its place, to whom these effects would be new, it appears to me that the time has arrived when I may comply with your editor's desire that I should re-publish my explanations of "Optical Illusions" in a revised and possibly extended form.

With this slight preface, let us at once enter upon our subject.

If we search back far into the past, in fact past the commencement of history, into the borderland of legend, we find there is reason to believe that many of the principles of optics, as applied to illusions, must have been known to certain sections of the world's inhabitants; but this knowledge was most jealously guarded and used only for the purposes of fraud and deception. Many have supposed that the use of concave mirrors was known to the Ancient Egyptian priesthood, and that it was by this means that their deities occasionally made themselves manifest to the initiated; but we have no absolute data to found upon in this matter, it is pure conjecture.

The same is the case with most of the illusions used by so-called wizards and necromancers in the middle ages; the accounts are so vague and unsatisfactory that I have decided to pass them by, and deal only with those which have been produced more recently, and of which we have more definite particulars.

It is, in many cases, extremely difficult to draw a hard and fast line of limitation between optical illusions proper, and mechanical illusions, especially when used for stage purposes, as many mechanical illusions requiring no special optical apparatus, yet depended upon principles which might

easily come under the head of optics. To illustrate my meaning I will tell you how a stage ghost was produced when this century was young. We know that the ghost of his father appears to Hamlet, in the play of that name, and the scene being dark, the ghost used to gradually rise through a trap on one side of the stage, and, after reciting his story, as he slowly made his way across the stage, went down a trap on the other side. Sometimes he could not find the trap, and was obliged to go off at the wings, accompanied by derisive remarks from ribald persons in the auditorium, so it was felt some improvement must be made.

A doorway was accordingly arranged in a dark corner of the scene, and a piece of muslin tightly stretched over it. The surrounding scene was painted in the ordinary manner, so as to render it perfectly opaque; but the door on the muslin was lightly painted, so that the grain of the muslin was not closed, but remained transparent (Fig. I.).

The figure of the ghost being placed behind this door, and kept quite in darkness, was not visible to the audience, as the door being illuminated only from the green footlights,

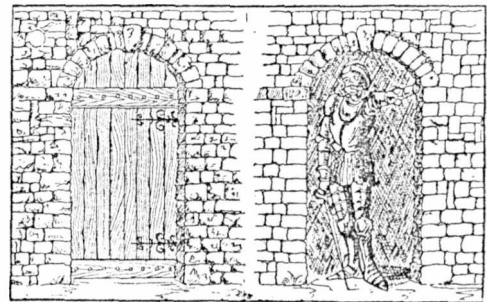


Fig. I.

Fig. II.

appeared solid; but when at a given signal a powerful light was allowed to gradually diffuse itself over the apparition from the side, the door melted away and the figure was seen in relief (Fig. II.). Those who have never seen this effect would be surprised at the realistic manner in which the figure apparently fades into space as the light at the back is reduced, and I strongly advise any who have to do with amateur theatricals or in organising shows, for charity bazaars, to bear this effect in mind, as it is not generally known, and can be arranged by any one at very little expense. This is an example of an illusion which, although mechanical, yet owes its success to optical principles.

If we were to search through the length and breadth of the land, we should hardly find a man of middle age and ordinary intellectual capacity who had not heard of, if not seen, the great ghost illusion familiarly known as "Pepper's Ghost"; and although many descriptions have been given of the means by which the ghost was raised, still many interesting details yet remain which the writer has

never seen referred to in print. These details, which have been gathered from personal observation, will appear as we proceed.

Most of us know that the effect is produced by reflection from the surface of a plate of plain glass; but although apparently so simple, yet there are certain laws in optics which must be obeyed in order to produce it in perfection.

It may be in the memory of many, that when first brought before the public by the popular professor, the ghost did not walk, it simply appeared in one spot, remained fixed there, and disappeared. In explaining the reason for this it is necessary to bear in mind the fundamental principle "that the angle of reflection is in all cases equal to the angle of incidence," or, in other words, "that the image will appear in the same position behind the reflecting surface as the object occupies in front of it." To make this quite clear your attention must be called to the following diagram:—

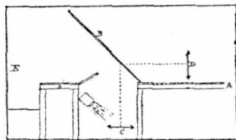


Fig. III.

At (AA) we have the stage: (B) being a large sheet of transparent glass, (C) is the actor representing the ghost, and (D) is the spot occupied by the spectre when the whole is viewed from (E). Now from this it will be seen that the living man was obliged to lie in a sloping position, sometimes, as in the diagram, flat upon his back, in order to keep his body in the correct position, and in consequence could not walk about, the only motion that could be given to the figure being a gliding one,

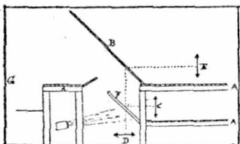


Fig. IV.

But shortly afterwards a great improvement was made; the living body was not directly reflected, but its reflection was reflected by means of a large sheet of silvered glass, as will be seen in diagram IV. Here we have the stage and glass as before, but the actor (C) instead of being upon his back, stands boldly upright, the image being formed in its proper place, with relation to the large transparent medium (B) by the silvered glass (F). Thus it will be at once apparent that under these circumstances it was not the actor himself who was reflected, but his image, as it appeared at (D), which image occupied the same relative position to the sheet of glass (B) as the actor himself did in the first diagram. This at once made a great difference. The ghost could roam about the stage, and could float through doors and windows, besides indulging in other little eccentricities with which apparitions are commonly credited.

One of the most popular entertainments illustrated by means of this illusion was Charles Dickens' "Christmas Carol," the tale of Scrooge and Marley, in which it will be remembered the ghost enters by the door, and, after walking round the room, gradually fades through the window.

Another method of showing this ghost illusion consists in placing the glass reflector in a diagonal position across the stage, the figure to be reflected being placed behind one of the side wings. This method, although much more simple in its requirements than the original, blocks the stage to a much greater extent. Some very good effects have, however, been obtained by its means, and in an entertainment produced by its author, the late Dr. R. C. Croft, at the Royal Polytechnic Institution, on December 24th, 1874, and entitled the "Mystic Scroll," a cave scene, containing a life-size statue was introduced, which statue, after an incantation had been performed, awoke to life, opened its eyes, and amidst the low rumbling of thunder, and to the accompaniment of

mysterious music, gave us the following recipe for growing rich:—

"Mark me! He who each day one pin shall save,
Within the year a Fourpenny Piece shall have;
He, who to bed shall early go—is Wise.
Who would be Wealthy, he must early Rise!"

And with a loud clap of thunder the statue becomes once more inanimate. The information given is vague in the extreme, but the effect was produced as follows:—A sheet of glass was placed in a diagonal direction across the stage, standing perfectly upright, the left side (from the auditorium) being placed about ten feet back from the proscenium, the right edge being carried backwards until the plate stood at an angle of 45 degrees to a line drawn from side to side of the stage. Behind the right side wing was placed a screen covered with black velvet, having a hole cut in it (at about six feet from the ground) of the proper size to fit the face of the living object, when thrust through from the back.

The living face having been whitened and placed in this space, was strongly illuminated by limelights from the flies at the opposite side, and the ghost of the face then appearing behind the glass, the statue was fixed in position so that the features of the plaster cast and the reflection of the features of the living object superimposed.

When this was arranged, it was always ready at a moment's notice. In actual exhibition the scene was illuminated by green lights, and the statue thus kept in partial darkness.

If we revert to the original position of the glass, inclining at the top towards the audience at an angle of 45 degrees to the stage, a very good effect can be obtained by dressing a number of figures as Imps or Crocodiles and allowing them to crawl about on a floor built in the position occupied by the actor (C) in Fig. III. The flat of the scene being placed about two feet in the rear of (D), the ghostly figures will appear to be walking up and down the walls of the apartment.

I might easily multiply instances in which, by a slight alteration in the position of the glass, various curious effects may be produced, but wish now to direct your attention to an ingenious adaptation of Professor Pepper's principle lately exhibited in France.

In the Hall of Exhibition some curtains were closely drawn, and a railing ran from side to side to prevent visitors approaching too closely. After a little music to settle down the audience, the curtains parted, and a beautifully painted sea-view with a setting sun was disclosed.

The scene had a slightly hazy appearance owing to a piece of gauze being stretched over the entire opening, and the sides of the circular picture gradually faded into nothing on account of several circular frames of gauze being placed

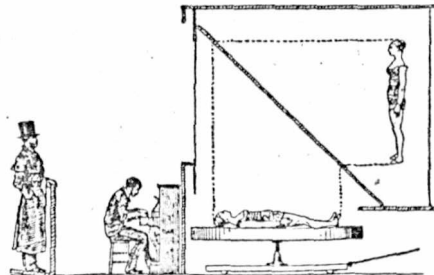


Fig. V.

overlapping each other like the capes on the old-fashioned coachman's cape. After a short explanation, a figure representing a Sea Nymph rose from out of the waters and floated about, turning head over heels in a most remarkable manner, finally vanishing downwards once more. The method of production will, I think, be sufficiently apparent on reference to the sectional view (Fig. V.).

There we see the inclined plate of glass and the recumbent figure as in Fig. III., but in this latter case the figure was placed on a turntable to give the effect of somersaults, and the turntable itself ran on wheels to cause the figure to rise and fall by being pushed backwards and forwards.

At the close of one of the Christmas entertainments at the Royal Polytechnic Institution, a very remarkable adaptation of the ghost was exhibited under the title of "Asmodeus, or the Bottle Imp." The arrangement for reflection was the same as in the case of the statue, but the figure, instead of being directly reflected, was first received on a convex mirror, and thus reduced to about fifteen inches in height. This image formed by the mirror was reflected on to a spot occupied by a large champagne bottle standing on a table (one of those large "dummy" bottles, about thirty inches high, used by wine merchants to decorate their windows), and the effect as the diminutive figure jumped up and down, apparently inside the bottle, caused much amusement.

In spiritual seances one of the most ordinary manifestations is the levitation of solid or material objects. How this is accomplished I will not pretend to explain, but the same effect can easily be obtained on the stage by very simple means, as I shall endeavour to show.

For the object we will choose a chair. The stage is prepared by having a long narrow piece cut out just sufficiently large to allow a plate of transparent glass to travel up and down on edge through it, the plate being the width of the seat of the chair it is proposed to float.

As the glass in this case is not required for reflection it may be placed at any angle with regard to the audience, the best possible position being with its face to the footlights. Considering the latter, it would be better if they were dispensed with altogether in this case, and all the illumination allowed to come from the top and sides, in order to guard against the possibility of detection by the reflection of luminous objects by the glass plate, which would at once reveal its presence.

Below the stage there are vertical grooves in which the plate slides, and an arrangement of cords and pulleys to cause it to rise and fall at will. It should work with a slow and perfectly even motion, as any jolting would put the spectators on the track at once. The following diagram (Fig. VI.) will render the description clear:—

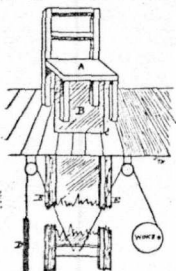


Fig. VI

(A) is the chair resting upon the glass plate (B), which slides up and down through the cut in the stage (C), by the aid of the weight (D), being kept rigidly in place by the vertical grooves (EE).

If properly balanced on the edge of a stout plate, very heavy objects can be moved in this manner, and the writer has seen a couch, with a lady reclining upon it, elevated to a distance of about five feet above the stage, by means of a large plate extending right across a small stage and running in grooves placed behind each side-wing, the lower portion

of the apparatus being the same as in the case of the chair.

Up to the present the effects I have described have been the result of sliding plates of plain glass. Now let us, for the sake of variety, turn our attention for a time to illusions, depending for their success upon plates of reflecting silvered glass.

In 1879 Professor Pepper, in conjunction with Mr. Walker, produced at the old Polytechnic, and afterwards in other places, including the chief cities in Australia, an optical effect, which they entitled "Metempsychosis." It was considered to be one of the most perfect illusions ever brought before the public, and when introduced in dramatic sketches, caused much surprise and amusement. By means

of this apparatus, a variety of changes, such as a living man, appearing in a previously empty arm-chair, a basket of oranges changing into pots of marmalade, etc., etc., were accomplished, the latter feat being exceedingly popular, possibly on account of the practice of distributing the pots amongst the audience.

One puzzling change was that of a woman to a man. I do not know if the lady was the "New Woman" we have heard so much about lately, but in this year of 1907, in costume, at least, we should not require any very complicated apparatus to effect the transformation.

The first dramatic sketch in which this truly marvellous apparatus was used was entitled "The Artist's Dream," and on the rise of the curtain, the stage appeared set out as an artist's studio, the walls being hung with the usual properties one would expect to find in such a place. On the O.P. side of the scene (Fig. VII.), near the front, stood a large easel, supporting a partly-finished outline of a head; further up the stage, on the same side, an antique carved wood table, of the well-known Wardour Street design, was standing, upon which rested a large shaded lamp, which was supposed to illuminate the room. On the other side, the space was occupied by chairs, etc.

In the centre of the back appeared a small chamber, with a large arm chair at the back. The floor of this apartment was raised about three feet above the level of the stage, and was approached by a short flight of stairs (Fig. VII.). Originally, a light was placed under this chamber, to show to the audience that nothing in the nature of a trap door was used, although, in witnessing illusions, we must never allow our vigilance to be relaxed for a moment by any appearance of candour on the part of the arch-deceiver in charge. However, in this case it was perfectly honest, as no traps were necessary.

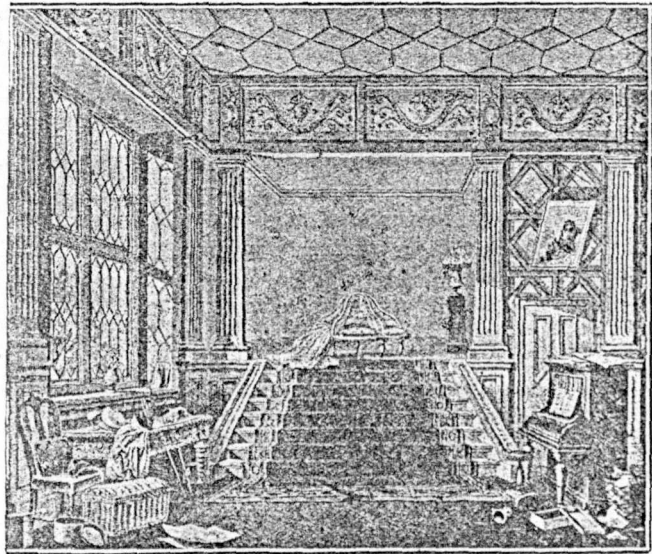


Fig. VII.

The scene reproduced is photographed from a drawing of the stage as set out to introduce the illusion in the late Mr. George Buckland's entertainment, entitled "Carried Prawns."

In the case of the "Artist's Dream," immediately on the rise of the curtain, the usual stage business took place: a servant coming in to dust and arrange the room, being shortly followed by the artist himself. Presently a knock on the

door precluded the entrance of two porters, each carrying a bundle of something, done up in a cloth, and which, on being opened, exposed to view the two halves of a lay figure, made of *papier maché*.

The lower half being seated in a chair, was joined to the upper by means of a large wooden peg. Now, to disabuse the minds of the beholders of any idea of little boys being concealed inside, a large trap door was made in that portion of the figure's anatomy usually occupied in the human subject by the organs of digestion, and this was now opened to show that the figure was really hollow.

A dialogue now occurred between the artist and the porters as to the best place to put the figure for the present, and the difficulty was finally solved by seating it in the arm-chair in the little chamber at the back, where it remained in full view of everyone in the auditorium. The men then retired, the stage was slightly darkened, and the artist settled himself comfortably in a chair by the lamp, and proceeded to seek inspiration by reading the newspaper.

I do not know what he read, perhaps a political leader, but he soon felt its soothing influence, and, after nodding a few times, sank into a profound slumber.

Then something peculiar occurred—something that arrested the breath of those inclined to nervousness.

A long tremolo sound of a weird nature was heard; a light from some point, not easily determinable, fell on the lay figure, as, with a jerky mechanical motion, its head moved from side to side, as if looking round the room. It then slowly arose to its feet, and walking forward, came down the steps on to the centre of the stage, where it paused for a moment.

This picture was very impressive, the faint light in the little room at the back, the semi-dark stage, with the artist asleep under the warm rays of the large shaded lamp, and the lay figure standing in the centre, all its joints apparent, and bathed in a mysterious steely blue light, together with the weird musical accompaniment, formed a tableau which haunted the memory for long afterwards. The figure then turned towards the easel containing the half-finished outline, selected a piece of crayon, and proceeded to finish the drawing, after which it slowly retreated backwards up the stage, mounted the steps, and sat down in its original position in the arm-chair.

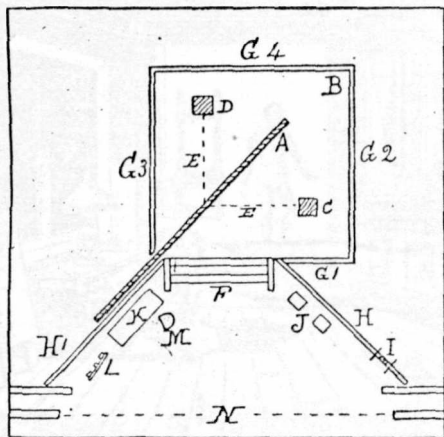


Fig. VIII.

After a moment's pause the artist started up with a terrific yell, the lights were raised, and in rushed the two porters and the servant. The artist bounded up the steps into the rear apartment, and grasping the lay figure, dragged it down to the front of the stage near the footlights, where

they all seized it by the arms and legs, pulling it to pieces, after which, down came the curtain.

Now, having described the general appearance of this illusion from the auditorium, let us consider the means by which all these mysteries were accomplished.

When first produced the stage was not so elaborately arranged as in the drawing, but was simply closed in, in the shape shown in Fig. VIII., by flat scenes and drapery.

To properly appreciate the description, it will be necessary, in the first place, to turn our attention for a few moments to the diagram, Fig. VIII., as that gives us the whole ground plan, and also the working parts.

At *x* we have the opening in the proscenium, *h, h* being

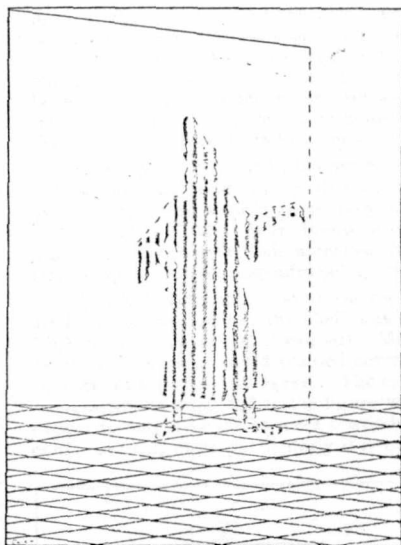


Fig. IX.

two flats of scenery which close in the stage from the front wings to the steps *F*, which in their turn lead up to the small chamber of mystery at the back, in which all the changes occur. The walls of this chamber are *G1, G2, G3* and *G4*. *A* is a large sheet of silvered glass extending from floor to ceiling, which can be wheeled to and from *B* on a specially constructed carriage, the glass travelling through a narrow groove in the floor. I must remark in passing, that in order to conceal this groove, the

floor was covered with a pattern consisting of diagonal lines crossing each other, one set of lines running parallel with the groove.

Now, if this travelling reflector is completely withdrawn, the audience are able to see straight through the entrance of the chamber to the back wall, the chair marked *D* being in the centre of the field of view. The mirror then being pushed across the chamber, *D* vanishes from before the eyes of the spectators, and the walls of the chamber at *G1* and *G2* being reflected at *G3* and *G4*, the disappearance of the chair is the only apparent change.

It will doubtless occur to many that as the edge of the mirror travelled past the chair a hard line would be seen; I mean that there would be no gradual disappearance, there would be no distinct vertical line, which would seem to wipe out the object as it passed along.

To avoid this, the inventors hit upon a most ingenious expedient. They etched vertical lines in the silver deposit on the back of the mirror at the travelling end (that is, the end which passed across the field of view), commencing with thick lines close together, and tapering off to thin lines further apart. Thus the glass at its extreme end was half transparent and half reflecting, giving a very vague and misty appearance to any objects reflected by or seen through it.

In the illustration (Fig. IX.) these etched lines are much exaggerated in size, as it would be next to impossible to reproduce the portrait of the gentleman depicted, in such thin slices as occurred in the illusion. Each line would not be

individually perceptible on the stage, but only a general haziness. This appearance is just the same whether the figure is being disclosed by withdrawing the glass (the edge of which is marked by the dotted line) or being reflected from a hidden object by pushing the mirror forward along its groove.

This appearance and disappearance of objects would not, however, present any features of novelty if the illusion consisted in that alone, but I have simply introduced this to give a plain illustration of its working.

There is one point which we must pay particular attention to, and that is the illumination in the chamber of mystery (a gas jet marked B). This must be arranged so that it illuminates the walls, ceiling and floor equally on both sides of the mirror; this is extremely important, as a little light more or less on one side of the room would at once show that some change took place as the mirror passed.

If we first place a chair at c similar in all respects to that at d and exactly registered with regard to reflection, we may pass the mirror A to and fro as often as we please without any change being apparent, as the reflection takes the place of the reality, and we suppose we are still looking at the solid object. It is impossible to place too much stress on this point, as the proper appreciation of all that follows depends upon keeping this fact well before us, and it is to this peculiarity that the illusion owes its greatest triumphs.

When these two chairs are in position, the actor may walk up the steps and sit in the chair to prove that it is a reality, and immediately upon his retiring from the chamber the glass may travel across (the reflection of the chair taking the place of reality). A second actor habited as the spectre then enters behind the glass by a concealed door, and seating himself at d the glass can be slowly withdrawn, the etched portion as it passes between the audience and the spectre gradually revealing him until the reflector, being entirely withdrawn, the apparition is fully exposed to view, and able to walk about the stage, after which he once more seats himself and disappears.

These conditions being understood, let us take in detail the operations necessary to produce the mysterious effect described.

It will be remembered that an artist having purchased a lay figure, two porters bring it to his studio in sections, which

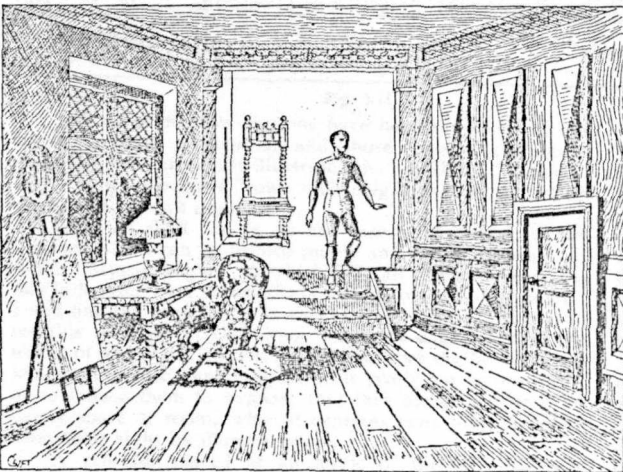


Fig. X.

are put together, and the whole deposited in the chair d. They retire, the artist falls asleep, the lay figure descends the steps, finishes the outline of a portrait, and ascending to its original position, becomes once more inanimate.

To accomplish this the "Property Man" has to be called to our assistance to make two lay figures of *papier maché* and one suit of plates of the same material, to exactly resemble the lay figures when worn by a living person.

In preparing our entertainment, we first place one of the lay figures in position at c, seated in the chair and facing along the dotted line of reflection E, and the glass being drawn completely off the floor of the chamber, and left standing behind H, the figure is out of sight from the auditorium.

After the preliminaries have been gone through and the lay figure seated in its place, the glass reflector is pushed across the stage, and the figure removed, its place being supplied by an actor made up to resemble it exactly.

Great care has to be taken in ensuring that the two figures, the dummy, and the actor made up to resemble it, occupy the same positions on the chair, and are in register with the lay figure at c, but even with the greatest amount of pains it is not always possible to avoid a slight difference being perceptible as the glass crosses. The only effect of this, however, is to give an undulatory or wavy motion to the image, which imparts to it the appearance of shuddering.

Directly the actor is in his place the glass is drawn back out of the way, and, as by this time the artist has fallen asleep, the weird chords (especially devised to harrow the feelings of all who hear them) are commenced by the musicians, and under their influence the lay figure gradually stands upon its feet, and advancing, descends the steps.

At the Polytechnic Institution the figure was impersonated (or, to be correct, the shell was filled) by Mr. Walter Lightfoot, so long the "Property Man" of the establishment, and although not a trained actor, his performance was realistic in the highest degree. The creaky, jerky, uncertain movements he imparted to the figure were such as we should expect to find were we to meet a wooden lay figure out for a constitutional, more particularly if it had been left in a damp

corner for a time; and the effect as it descended the centre of the stage was so great, that many persons, having struggled hard to get into the front seats, appeared to wish they were a little further from the stage.

After sketching on the canvas standing on the easel, which will be found on the left side of the illustration, the figure retired to its seat, the glass

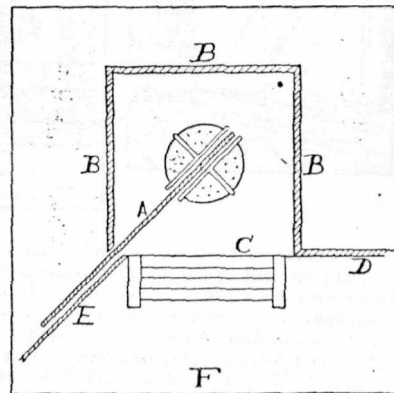


Fig. XI.

travelled across to hide the change, and the original figure was restored to its place, after which the glass being once more drawn off behind the scene, the artist could run up the steps and drag the mysterious figure down for dissection. Thus closed one of the best and most striking illusions ever brought before the public.

After a time, when it began to be felt that some change was necessary in the programme, an improved form of this illusion was invented by Mr. Walker and introduced in a musical entertainment from the talented pen of Mr. Burnand, of *Punch* fame, and entitled "Curried Prawns."

It was produced by my old friend, the late Mr. George Buckland, and represented the trials of a gentleman, who,

having a party of friends in his house for the purpose of giving an amateur edition of the opera "Faust," indulges too freely in that extremely indigestible dish, "Curried Prawns," and falling asleep immediately after, is visited in his dreams by Mephistopheles, Marguerite and Faust, Mr. Walker's illusion being responsible for the apparitions.

The diagram (Fig. XI.) will show the ground plan of the working parts when arranged for this entertainment. The shape of the scene and chamber of mystery (or changing box) were altered in this case, and by reference to Fig. XI. you will find that the front wall of the chamber marked G in Fig. VIII. was removed, and the whole room exposed to the sight of the audience.

In the centre, over the groove, stood an ottoman, which was divided into two parts along the course of the groove, the separation just allowing sufficient room for the passage of the mirror. Although this was regarded as an improvement, yet it will be at once apparent that no changes, such as those mentioned in "The Artist's Dream," could be introduced, as there remained no place behind which the doubles could be concealed.

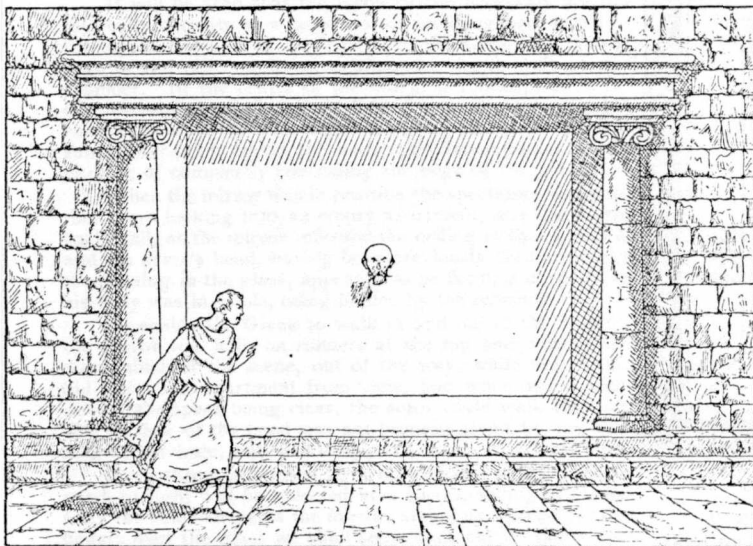


Fig. XII.

The most effective illusions have been the result of extremely simple appliances, and those I have previously described will sufficiently illustrate this. Both the "Ghost" and "Metempsychosis" owe their origin to reflection at an angle of forty-five degrees.

This we shall find to be the case with almost all the illusions which can be termed purely and simply optical. It is the "Mystic Angle" to which they all owe their success, and in looking over those effects I hope to treat of presently, I still find the same thing in almost every case. The reason for this is sufficiently obvious, when we consider that the object of an optical illusion is either to lead the beholders to imagine they see something which is really not before them, or to induce them to suppose that they are gazing into an empty space or room, when it contains some object hidden from their sight by illusory means.

A reflector placed at an angle of forty-five degrees answers both of these purposes; in the ghost illusion the objects were reflected from below, in Metempsychosis from the side, and in "The Modern Delphic Oracle" an object is concealed by reflection from another quarter, which we will not enter into until after viewing the whole affair from the front of the stage. Here is a little illustration of the simplest

character. In the suburbs of Brussels stands a picture gallery known as the Musée Wiertz, containing a collection of pictures painted by one man only. During his life M. Wiertz was very generally considered to be a madman, and when he offered the whole of his paintings to the Belgian Government, on the condition of a suitable building for their reception and exhibition being built, his offer was refused.

At his death it was renewed by his executors, and the authorities this time accepted the terms, and hence the Musée Wiertz.

Besides the pictures are one or two little optical effects, one of which struck the writer as worth remembering.

About five feet above the ground there is an oval hole in a screen, and above this a notice requesting visitors to put their faces into this orifice. On doing so one is surprised and, indeed, for the moment, unpleasantly shocked by observing immediately opposite a very misshapen little hunchback, whose face is that of the spectator himself.

The explanation is very simple. A painting in high relief of the hunchback is placed on the inside of the screen,

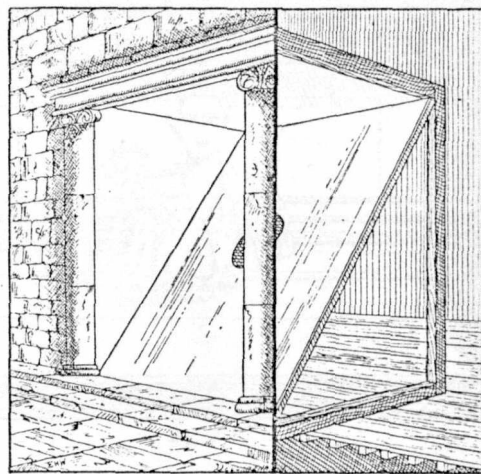


Fig. XIII.

leaving a hole where the face should be, and the visitor unconsciously finishes the picture by placing his own features in the vacant space, at the same time viewing the whole in a looking glass placed immediately opposite.

One of the principal illusions we have now to deal with was first produced at the old Polytechnic Institution under the title of "The Modern Delphic Oracle," and when all the circumstances, such as allowances for loss of light by reflection, proper angles, and appropriate scenery and accessories have been taken into favourable consideration, the result is very puzzling.

On the rise of the main curtain in the small theatre, the entrance to a Greek building or temple was discovered (Fig. XII.), the principal portion of the scenery being flat, with small entrance porch about twelve feet square in the centre, flanked on either side by columns, and approached by two or three steps. This entrance was closed by a curtain being drawn across; and presently, after a few bars of music, this was drawn aside, and an ancient Athenian nobleman walked down the steps on to the front of the stage, the curtain being drawn across again as he descended.

His appearance betokened advanced age, his garments spoke wealth, and his step was full of dignity.

After burning perfumes in a brazier, he invoked the spirits of deceased celebrities, amongst others, Socrates, when, the curtain rolling back, the head of the sage appeared floating in space in the centre of the small temple. When Socrates had treated the audience to "a taste of his quality," the curtain closed him out, and others appeared in the same place. One entertainment given by the aid of this apparatus was entitled "Shakespeare and his Creations," and consisted in the successive appearances of a number of heads of characters from the great dramatist's works.

After the exhibition of each head, the curtain was drawn across to conceal the change, and finally the noble Greek made his exit passing through the spot where the heads had appeared, thus showing that no apparatus of any kind existed there. One peculiarity about these heads was their solidity; there was not the slightest doubt about that, and it could be plainly seen that the head cast a shadow on the wall behind.

The mode of working this illusion was very simple, and the sectional view, Fig. XIII., almost explains itself.

It will be seen that the whole of the necessary apparatus really consists of a large mirror inclining backwards at the top at an angle of 45 degrees to the stage, the bottom edge of the reflector being against the front wall of the chamber. In the centre of the mirror a round piece is cut out just sufficiently large to allow the passage of a human head when made up with wig, beard, and a collar or ruffle of some description round the neck, this latter being for the purpose of completely concealing the edge of the glass.

When the mirror was in position the spectators imagined they were looking into an empty apartment, straight to the back wall, as the mirror reflected the ceiling in that position, and the actor's head, having been previously thrust through the opening in the glass, appeared to be floating in space, as his body was invisible, being hidden by the reflector.

To enable the Greek to walk in and out of the Temple, the mirror was built on runners at the top and bottom and was pulled off the scene, out of the way, while the curtain hid the small apartment from view, and when again withdrawn, the space being clear, the actor could walk through. The shadow of the head was not brought about by any cunning contrivance, but was simply the result of natural laws.

If we throw a diffused light on a mirror at an angle, a patch of light will be reflected at a corresponding angle exactly the same shape as the mirror, and if we spread out our fingers over the glass we shall see a dark mark exactly corresponding to the shape of the hand upon the image of the reflector. Therefore, if we throw a light upon the large mirror used in the illusion, the light will be directly reflected on to the ceiling illuminating the whole of it with the exception of a small round spot in the middle corresponding to the spot in which the piece is cut out in the mirror, for as this portion possesses no reflecting quality no light can be reflected by it.

The ceiling being then reflected to form the back of the Temple the small spot of darkness appears in the centre just behind the head, and produces a natural effect sufficient to throw the most expert illusionist off the scent.

One of the subjects illustrated by this form of apparatus was known as "The Cherubs floating in the Air" and represented five cherubs grouped according to the celebrated picture by Sir Joshua Reynolds, the little heads and wings apparently floating in space. Unlike most optical illusions, all these effects were produced on a brilliantly illuminated stage, and I think I may safely assert were extremely popular.

At various times we have seen at shows and various places of public entertainment an adaption of this principle, which, although in the main is a copy of our last illusion, goes yet still further and possesses an important improvement, which renders it very puzzling when first viewed.

In the room of exhibition a barrier is placed about eight or nine feet in advance of a handsome gilt picture frame, which apparently hangs upon the wall, but which instead of containing a picture is closed in by a curtain. After an introductory discourse by the exhibitor explaining illusions generally, which is carefully worded to distract the attention of visitors and confuse their ideas generally, the curtain is drawn aside and the interior of the frame appears as in Fig. XIV.

The young lady in our illusion is wearing a contented smile, as who would not, under similar circumstances, being quite free from most of "the ills the flesh is heir to" on account of a total absence of body. To prove to us that we could really see to the back of this small apartment, the exhibitor explained that he would go to the back, and, opening a panel, look through at us.

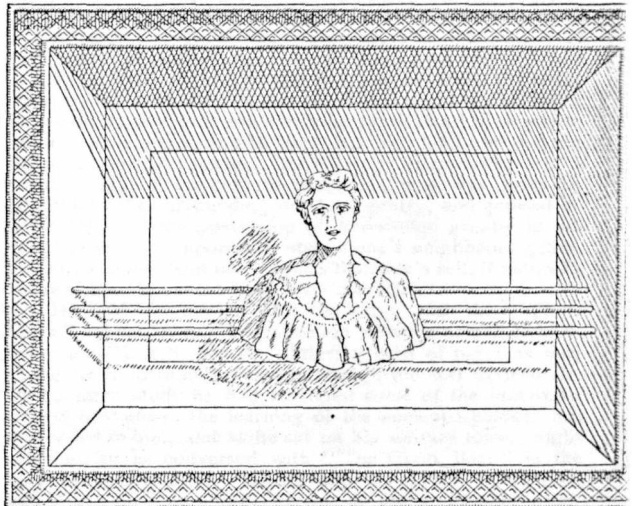


Fig. XIV.

In the illustration (last chapter) an inner line will be noticed round the back wall. This is a removable panel, and, when taken out of its place, we could see right through to where the showman bowed, the head still being apparently disconnected from any possible body. After having read the description of "The Delphic Oracle," it will at once occur to our minds that this illusion is worked in the same manner, by means of the mirror inclining towards the back, and with a hole through the centre. The brass rods are really only halves, being flat on one side from end to end, and would exhibit a semi-circular section. Being fixed on to the surface of the reflecting glass, they appear as whole rods, and this will at once explain why they are placed at the particular angle they occupy.

But now comes the question—How does the exhibitor show himself through from the back? He cannot be solid; we must be looking at the reflection, as we know that he could not be seen through the mirror.

Where is he reflected from? Only one place is possible, and that is the top. This suggestion, however, does not lead us much further, for on consideration we find that if he removed a panel in the top of the chamber, and bent over to show himself, his image would be reversed, and would then appear head downwards.

The difficulty is overcome in the manner shown in the sectional view (Fig. XV.), where we see the remainder of

the young lady's body hidden behind the sloping reflector, as in the last illusion. The mirror which conceals her body

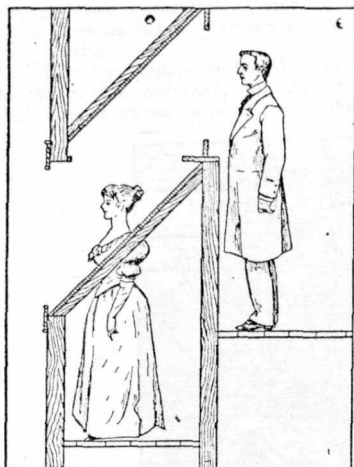


Fig. XV.

has its reflecting surface upwards, and above it a panel in the top, which, when reflected, appears as the one in the back of our front view of this illusion. Above this panel, which is removed in our sectional view, is another mirror with its reflecting surface downwards, and facing that at "the mystic angle" we find another panel in a vertical position. It will be seen that if this middle panel is closed its reflection will be received in the lower mirror, and will appear at the back of the small chamber in which the living head appears to be suspended. When the operator has taken his position at the rear, as we see him in the illustration, the panel is removed, and we think we see him, but owing to his image being reflected twice, he appears standing a little way back from the open panel behind the lady's head.

The illusions I have treated upon so far have been accomplished, in the first instance, by simple light and shade, then by reflection from sheets of plain glass, then levitation by sliding plates of transparent glass, and recently by means of plain mirrors placed at an angle; so we will now take a step further, and consider a few effects, the result of plain mirrors placed at an angle, and acting in concert with each other.

It might be urged that the last illusion we described would come under that heading, but that is not so, as it was perfect in itself without the aid of the second reflector for producing the image of the assistant. Many scientific toys have been formed by the use of two pieces of looking glass, as, for instance, "The Kaleidoscope," and Professor Wheatstone's "Reflecting Stereoscope," which has no lenses, but owes its properties solely to two pieces of silvered glass.

Some time back I and others were attracted by a crowd at a street corner, and on pressing forward to see what was the matter, were amused to find that an ingenious mechanic out of work, had constructed an instrument which enabled the observer to look straight through a brick.

Now this is not very new, and no doubt many of the readers of this annual will recognise the apparatus at once, but for the benefit of the few who possibly are not acquainted with it, we will ask them to bear with us for a few moments.

In outward form it resembles Fig. XVI., and on looking in at (A) through what appeared to be a powerful eye piece, the spectator was able to see objects on the other side of the street, in spite of the fact that a brick was intervening in the centre of the apparatus. The body of this elaborate machine was mainly composed of three cigar boxes, with pieces of brass tube let in at each end. The "lenses" in the ends of these tubes were composed of circles of plain window glass, and the scheme of the whole illusion will be seen on reference to the diagram, the double dotted lines showing the position of the mirrors, and the single dotted line is the line of reflection. The whole instrument reminded us, very forcibly of the "patent double-million magnifyin'

gas microscopes of hextra power" spoken of by Samuel Weller in the trial scene in Charles Dickens' "Pickwick Papers," and by the aid of which he considered he would be able to see through a brick wall.

Amongst the most striking illusions brought before the public during the connection of Mr. Thomas Tobin with Professor Pepper at the Royal Polytechnic, was a striking if rather ghastly effect, entitled "The Head of the Decapitated speaking." Although horrible in appearance, it caused much wonder and entertainment amongst the large crowds of people who flocked to see it every afternoon and evening, many of whom, having paid a shilling to get in, would have gladly given two to get out again when the curtain was raised.

It was the custom to preface these illusions with a short lecture on illusory subjects just to fill in time, as none of these effects occupied long in actual exhibition. In this case the story which introduced the effect precluded the disclosure of the scene, and although I cannot vouch for the correctness of the words I shall presently give you, after the lapse of so many years, I will tell you the tale in my own way.

Some time in the Middle Ages, a conveniently vague date, there lived somewhere or other (we are very distressed, but really cannot give more definite particulars) a magician, not a parlour magician who burns handkerchiefs and restores them charmingly scented immediately afterwards, but a regular right down genuine magician, who was generally credited by the surrounding nobility, gentry, and general inhabitants with the possession of knowledge greatly in advance of his contemporaries, and as one's neighbours generally know more about one's affairs than one's self, it naturally follows that they must have been correct.

He held communion with the stars, not the "Three Stars" we mostly find in connection with the names of Hennessy and Martell, but the glittering orbs of night as they shone forth in radiant beauty through the soft eastern air. By constant study he had mastered some of the innermost secrets of Nature, the learning of the ancient Chaldees had descended to him, and as he sat on his solitary tower, night after night, he conversed with "The Great Bear" in the most familiar manner. Let us drop the curtain before him, and "ring up" on another scene—an Italian Palace, night. Through the large arches of a portico, partially hidden by heavy silken curtains, a magnificent garden is seen brilliantly illuminated by the moon's pale beams, the air is heavy

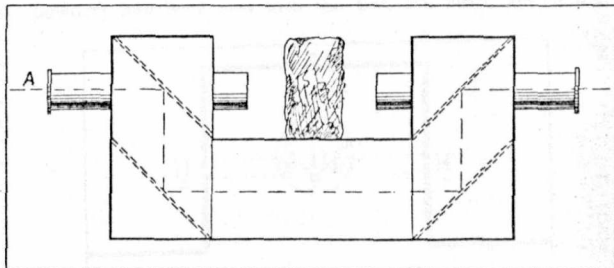


Fig. XVI.

with perfumes emanating from a large chased silver lamp, which hangs suspended by chains from the painted ceiling, and the silence is broken only by the plashing of the fountain without, and the hurried footsteps of a man within.

It is, indeed, a scene where all around is beautiful, and only man is vile; at least, this one was.

Those were the times when might was right, when the owner of each estate was entitled prince, and each prince exercised almost sovereign power. He had been prodigal of his wealth, and had brought himself to the verge of ruin; his days were miserable, and his nights sleepless. He reflected, he must do something—or somebody—it did not mat-

ter which, and it came into his mind that his nearest neighbour, Count Capo di Monti, a man of learning, who lived in seclusion, and was said to possess great wealth, was a suitable subject for the exercise of his talents. Accordingly, he engaged two unscrupulous men to kidnap the Count, and we first make his acquaintance, awaiting their return with their victim.

Soon footsteps were heard on the gravel. He advanced to the garden entrance, and signed to the villains to take their burden to the extreme end of the building, where stood

headless trunk lying on a heap of straw, but as my object is to inform and amuse, and not to horrify or disgust, I have to a certain extent "bowdlerised" the scene.

The thunder continued, but it is to be remarked that it was thunder of a very accommodating, not to say polite nature, as it kindly moderated its tone when the magician commenced to speak.

Raising his hand on high he cast one of his spells (red fire) into the brazier, followed by a more potent one (blue fire), all the time reciting an incantation which (green fire) was

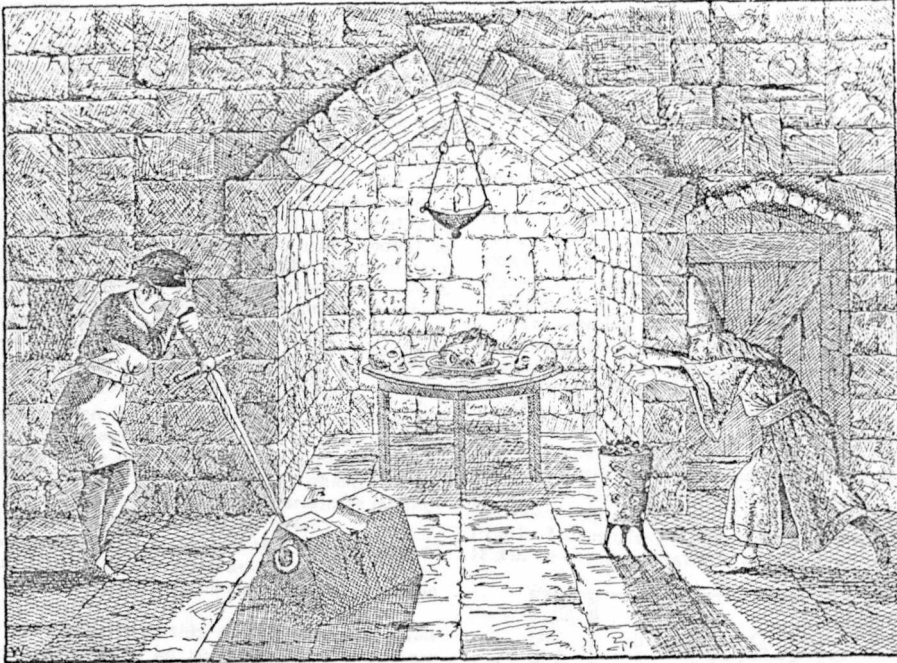


Fig. XVII.

a ruined tower, under which was the old torture chamber.

After a short interval of agitated indecision he made his way in the same direction, where we shall follow him.

To cut unpleasant matters short, all kinds of barbarities were exercised upon the unfortunate Count Capo di Monti, to induce him to give up his wealth, but without avail. While in the midst of these horrors, the magician I have mentioned arrived, having been previously summoned in case his aid was required. In consultation with his patron, he explained that the spirit did not leave the body immediately after decapitation, and promised that if the Count was executed in this manner, he would by magic spells compel the head to disclose any secret contained in the brain. The headsman was at once summoned, and the Count being decapitated, his head was placed on a plate—then the lecturer paused for a moment—tremolo chords issued from an invisible orchestra, and the curtain, slowly rising amidst low rumbling thunder and flashes of lightning, disclosed the scene illustrated in Fig. XVII.

A dungeon with a recess at the back, in which stood a three-legged table supporting a human head on a dish flanked by two grinning skulls, while overhead hung a lamp which illuminated very little more than the interior of the recess. Near the front on the O.P. side stood the headsman, clad in red and black, leaning upon a large two-handed sword, and close by him the beheading block, while the opposite side was occupied by the magician with a brazier before him. There were other objects on the ground, such as a coffin, and a

quite incomprehensible to the (a little lycopodium) mind of the uninitiated.

At last, after the most powerful spell (a pinch of gunpowder) had been cast into the fire, the head, apparently

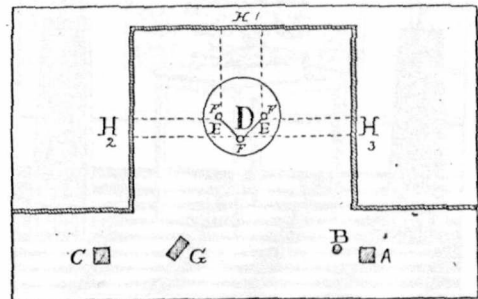


Fig. XVIII.

unable to bear it any longer, slowly opened its eyes and spoke as well as the fumes would allow it, asking the wishes of the magician. These he recited at great length, demanding to know where the deceased man's riches were concealed. The head then made a speech acknowledging the power of the magician, and proceeded to explain in what these riches consisted; but just as he commenced entering into minute details

as to where they were to be found, the power of the spells expired, the eyes closed, and down came the curtain.

Having seen the effect as it appeared to the visitors, let us inspect the modes of working this extremely dramatic illusion. We shall very quickly understand all about it on reference to Fig. XVIII.

(A) represents the magician, (B) the brazier, (c) the headsman, and (G) the block. In the niche at the back of the scene the round table (D) is supported by the three legs (FFF), between which to the right and left of the front leg are placed the two plain mirrors (EE). The edges of these mirrors at the top and sides are concealed by being let into grooves in the woodwork of the table, and the bottom edges are hidden from view by loosely sprinkling a little straw close against them.

The most particular point in arranging the table and mirrors is to be sure that the legs of the table stand at the same distance from the sides as they do from the back, otherwise the reflections will not register. For instance, in placing the table when fitting up, the width from side to side should be first measured, and if this is, say 12 ft., at 6 ft. from the back, a line should be drawn right across from one side to the other, and another from the centre of the back towards the front, and where these two lines intersect, the spot must be marked on which to place the front leg of the table. When this point is fixed, other lines drawn from it to the corners will give the angle for the back legs; the mirrors will then be found to be at the angle of forty-five degrees with regard to both walls.

In the space hidden by the combination of mirrors the actor kneels upon the stage, and thrusting his head through a hole in the table top, a dish in sections is arranged round his neck. His face is painted to appear as ghastly as art can make it, and just before the rise of the curtain he inclines his head a little to one side and closed his eyes.

It is almost unnecessary to remark that the painting of the scene should be exactly the same at the back and sides, so that no difference may be perceptible between the reflection and the reality.

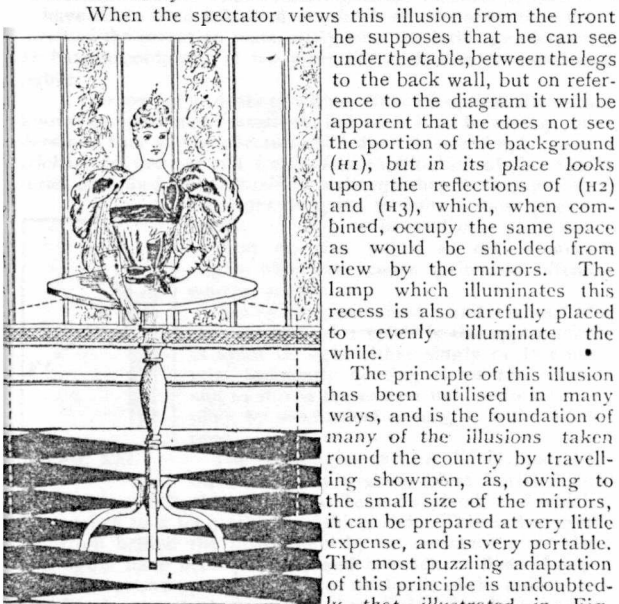


Fig. XIX.

a woman's body is represented as being supported on a table with one leg. We can understand the three-legged arrange-

ment, but this little chess table has a very remarkable appearance, as it would appear at first sight that there is no possibility of concealing any apparatus in this case. But it is in reality very simple, as we shall now see. The two mirrors are placed in the same relative positions to each other, and to the walls as in the last illusion, both having an edge let into the centre leg, and extending outwards as shown in the dotted lines in the illustration.

It was found by experiment that if the glass plates were of very fine quality and cleanly cut at the edges, that when viewed from a short distance in front, the edges were practically invisible, but when the spectator moved to the right or left of the centre they became apparent, and also the stage lights became reflected, showing a thin silvery line. In the first place a little lampblack was painted upon this line, but not being successful, it was determined to render the plates as thin as possible at the edges by bevelling, and by this means the plates were not to be distinguished from the surroundings when exhibited in a hall of any considerable size.

The most perfect illusion of this character (with the exception of the decapitated head) was witnessed by the author twenty-six years ago in a shop in Tottenham Court-road, which, being to let, was hired in the interim by a travelling illusionist, who exhibited half a young lady called "Fatima."

On entering the "Hall of Mystery," we found it divided into two parts by a barrier extending from side to side, the portion nearest the street being set aside for visitors, while the rear portion contained the illusion.

This illusion, which is set forth in Fig. XX., differed in one material point from the foregoing, inasmuch as the table had four legs. One leg was placed in the centre of the front, two others were at the sides, and one at the back immediately behind the front one. Now the three-legged arrangement has been explained, but where does the fourth one come from? This needs considerable thought to solve the mystery. It will be observed that at level distances on each side of the



Fig. XX.

table stand pedestals supporting lamps ostensibly for the purpose of illuminating the lady's face, and showing that "there is really no deception."

Although the drawing is not to scale, I have taken great pains to keep the correct angles, and if one of the side legs of the table is taken as a centre, it will be found that the lines in the pattern of the flooring upon the junction of which

the back leg stands, extends forwards right and left, passing the side legs, and also running behind the pedestals. If the squares are counted, it will be noticed that from the centre of the pedestals to the mirrors between the legs the distance is exactly two squares, therefore any object placed behind the pedestals would appear reflected just two squares further along the line towards the back; in fact, just where the back leg of the table is placed in the illustration.

Bearing this in mind it will be readily understood that it is only necessary to place a dummy leg in position behind each pedestal to realise this effect. It is necessary to have a dummy on each side, as the spectators standing to the left of the centre would see the reflection of that on the left, and those on the right of the centre, that on the right.

Mr. T. Tobin, one of the inventors of the "Decapitated Head" illusion, was, I believe, the inventor of "The Sphinx" exhibited by Colonel Stodare with so much success. It represented a living head supported on a small three-legged table, and was identical with the Decapitated Head.

Another method of using this illusion was exhibited at the old Polytechnic in an improved form. In this case the head was simply supported upon a short and slender pillar, the mirrors being without frames, and placed as in Fig. XIX. These edges, as I have before explained, were bevelled; but Mr. Walker, the inventor of Metempsychosis, has devised a much better plan than this for rendering the edges invisible. The small illustration, Fig. XXI, will almost explain itself, (A) is the plate of silvered glass, the extreme end of which (B) it is desirable to render invisible. Mr. Walker fastens a narrow strip of glass, half of which overlaps the end of the main plate, right down its edge. This narrow strip is not all transparent, the shaded portion at (E) being silvered at the back, and as it reflects the side of the apartment in the same manner as the mirror (A), the edge is practically annihilated, and it is quite invisible to the spectator at (F).

So important and striking are the results which can be obtained by the use of this invention that the inventor has protected it by law; I should mention in this connection that, although the name of Professor Pepper was coupled with that of Mr. Walker when Metempsychosis was first produced, I have since been informed on the best authority that the merit of the invention rests solely with the latter gentleman, he having completed it ten years before it was produced in public.

I purpose now dealing with a class of optical illusions known as spirit manifestations, but wish it to be clearly understood that all the effects I shall describe are simply stage tricks, and are not put forward in explanation of the mysteries described by spiritualists, although they were originally no doubt designed to imitate those phenomena. I wish to be perfectly plain and explicit on this point, as my remarks might otherwise cause pain and offend worthy persons.

One of the commonest manifestations of the presence of a spirit is the appearance of spots of light either singly or in clusters, frequently floating round the room, and as this is the easiest motion to accomplish by mechanical means, it is the most used.

The spirit light, (B) Fig. XXII, may be represented by a small glass bottle filled with oil in which phosphorus has been dissolved, and which is attached to a long stick or fishing rod. This is brought out from behind the proscenium by an assistant after the hall lights have been put out, and is made to float slowly round about and up and down over the heads of the audience.

The best method of working these lights is to bring them forward, not one by one, but in a bunch of ten or twelve, and the light emanating from them is so undefined in shape that

they do not appear as a bunch of lights, but as one single nebulous-looking mass. Each single light can then be carefully detached from the main body, and as they float away in all directions the effect is very striking. In these movements much depends upon the care and skill exercised by the as-

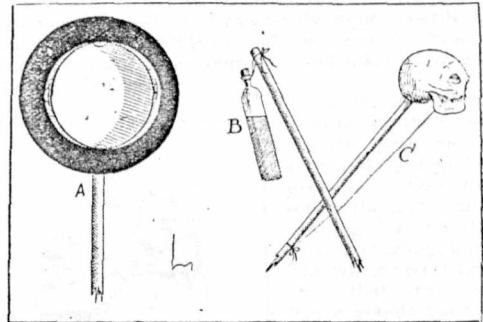


Fig. XXII.

sistants, as the luminous objects if moved too quickly would at once, by their line of motion, put the spectators on the track.

Another object which is always effective is the spectre hand, which is usually manufactured from an old glove stuffed with cotton wool and tied to the end of a fishing rod, after being liberally anointed with the luminous oil. During the course of an entertainment at which the writer was present, one of the audience rose from his seat and made a dash in the dark at the spirit hand with one of those walking sticks with a large crook on the end, so much affected by "Mashers" at times, with the result that he hooked the pole, and, his stick sliding down, pulled the glove off the end, exposing the trick.

With regard to the luminous substances with which these objects may be coated, the two mostly in use are, first, oil impregnated with phosphorus; second, Balmain's luminous paint. I have had considerable experience in the use of this paint for entertainment purposes, and have always found it act in a most satisfactory manner. The best method is to prepare the objects we wish to render luminous by painting them with this paint, and when required for use have them arranged along the wall in a room off the platform, and cause an assistant to travel backwards and forwards along the line with a magnesium lamp so that they absorb plenty of light, and are rendered thoroughly luminous. If exhibited shortly after this treatment they are very brilliant, shining with a light resembling the phosphorescence of the sea.

Tambourines, (A) Fig. XXII, can be treated in the same manner as the lights and hands, and form a good accompaniment to them, as a slight shake produces that jingling sound with which we are all familiar.

It will be noticed that these luminous objects would be apparent to the audience the moment they were brought into the hall or theatre, but in order to avoid this they should be kept closely covered with a cloth until required for exhibition.

It occurred to the writer that the effect upon the minds of the spectators would be much more striking if by any means the luminous appearance could be caused suddenly when the objects were at a distance from the stage. This would be very easy of accomplishment with the modern incandescent electric lamps obscured to the proper pitch, but the travelling lecturer would not always find it convenient to carry batteries of sufficient power, together with the necessary chemicals for working them, so I devised the following arrangement:—Each object we wished to send round over the heads of the audience was fastened to a circular piece of card coated with dead black, and sufficiently large to extend beyond it for several inches all round, as in (A) Fig. XXII. When brought into the hall the black backs were religiously

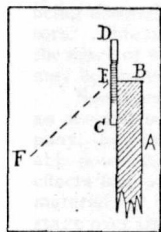


Fig. XXI.

kept towards the spectators, and in that position were projected outwards into the auditorium, when a sudden turn of the rod reversed the whole arrangement, and the luminous objects were visible to those sitting beneath.

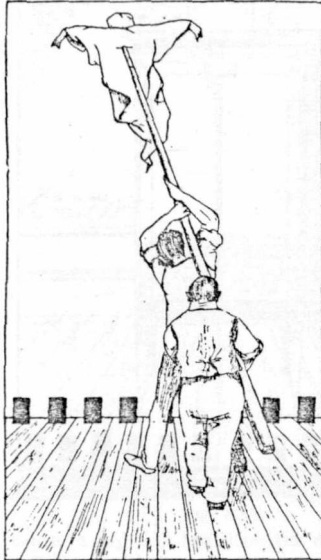


Fig. XXIII.

In a hall where plenty of space is available, floating forms of a nebulous appearance can be caused to appear, and travel outwards over the heads of the audience, and also to take one of the exhibitors by the hand, and, raising him from the floor, to glide through the air across the stage and put him down on the other side. This must necessarily be accomplished in utter darkness, and to avoid detection and to keep secret our means of operating, it is usual to turn the gas quite out. By arranging a small Rhumkoff coil in connection with the sun burner in the ceiling of the hall, the gas may be instantly lighted or put out from the main, a very necessary arrangement in all performances of this character.

Those who are familiar with stage properties will understand that the form of the spirit can be made in light wicker work to cover the front of the body and head of the performer (no back is required), which frame can be draped with material prepared with the luminous paint. When required for exhibition it is first exposed to the rays of the magnesium lamp, and then, being fitted on to the performer, the spirit makes its appearance and glides about the stage where required; but now, how is it to float in the air over the heads of the audience? The means of accomplishing this effect is so simple as to verge on the ridiculous; there are no complicated pieces of apparatus required, nor are the accessories expensive.

The person representing the spectre disengages himself from the basket framework, being assisted by others, who, taking care to keep behind the luminous figure, are, of course, invisible, and proceeds to fit our old friend, the long pole, into a socket provided in the frame, after which, the spirit form is slowly elevated (Fig. XXIII.), at the same time being allowed to move outwards over the heads of the spectators. This needs care, as the pole must be kept quite out of the reach of walking sticks and any structural obstacles which may be present.

Some years ago I read in one of the London daily papers an account of an exhibition in Blackburn, given by a company, the head of which was a lady said to possess considerable power as a medium. It would appear that the previous effects had not given unqualified satisfaction, and when the materialised spirit form, which should have floated from the stage over the heads of the audience to the end of the hall and back again showed signs of getting tired almost as soon as his journey had commenced, matters came to a climax. Some persons shouted for the gas lights to be turned up, others tried to "hook" the figure, which in turn became violently agitated as one might naturally suppose under such trying circumstances, and at last down it came on to the heads of the audience below.

The gas was turned up, and it was discovered that the "spirit form" consisted of a light framework covered with cotton wool, made luminous by chemical means. A wire

had been quickly stretched from end to end of the hall directly the lights were lowered, and the figure being slung on this should have travelled along when pulled by twine. I may sum up the subsequent proceedings by saying that the ghost was laid for ever so far as that company was concerned.

The wire is not to be compared with the pole, in my estimation, as a means of raising the figure, and is always a source of anxiety; while the pole, on the other hand, is only brought forward when required, and taken right away immediately afterwards.



Fig. XXIV.

The illusion of the spirit form taking the hand of one of the performers, and, after raising him from the ground, gliding with him across the platform and depositing him on the other side, is puzzling, but simple. The whole secret lies in the fact that the luminous figure stands upon a small carriage about three feet in height, moving smoothly on four wheels with rubber tyres. On the side of this carriage next the audience is a step, on to which the performer gradually raises himself one foot at a time when being apparently lifted by the luminous figure. Once there, the whole affair is wheeled by an assistant right across the platform from one side to the other, and as the place is in darkness, and the actor is only visible to the audience on account of being in front of the luminous figure, none of these manipulations (Fig. XXIV.) can be seen, the general effect only being apparent.

CABINETS have always been favourite media with illusionists, as they offer special facilities for concealment of apparatus, and are usually handsome pieces of stage furniture apart from their actual use. In all exhibitions of conjuring "The Magic Cover" plays a prominent part, although in some cases it is made of apparently innocent material, such as an ordinary newspaper. When a watch is to be manipulated it is most frequently placed in a box, a card is changed by being placed in a small case, wine and water having been mixed together in one decanter are afterwards separated, but always while hidden from view by "The Magic Cover," and so, in illusions on a larger scale, curtains and draped chairs, boxes and cabinets are just as frequently used.

There are so many kinds of cabinets that we might follow this branch of the art of deception to great length; but as we are at present concerned with optical illusions only, we shall give our attention exclusively to those few which are indebted for their powers to the science of optics.

One of the most mysterious of these cabinets was invented by Mr. Thomas Tobin, and exhibited in the small theatre of the late Royal Polytechnic Institution.

It was described in the programme as "The Proteus Cabinet," or "We are here, but not here," and by its means a series of startling changes and disappearances were effected. On to a brilliantly lighted stage a large upright cabinet was wheeled (represented in Fig. XXV.), the three sides and the door being panelled, four legs terminating in castors supported it, and a handsome moulding finished off the top. The inside was tastefully decorated with a small pattern paper in white and gold, a large railway lamp was let in through the ceiling for illuminating, and on the floor was a thick sheepskin rug covering it all over. There was also a post in the centre extending from floor to ceiling.

While some of the transformations were being accomplished the cabinet was wheeled about the platform to prove that no connection existed with the stage, and to facilitate moving

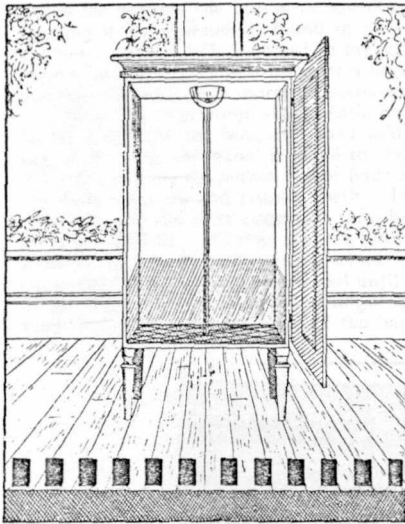


Fig. XXV.

the cabinet it was furnished with large brass handles at each angle of its sides, much the shape of those now placed on triple lanterns for the purpose of raising them.

The cabinet being placed before the audience, was opened, so that all could see that it was quite empty, and the door being closed, the whole thing was turned round to show the sides and back, when presently a tap was heard on the door, and, on being opened,

out jumped the programme boy of the Institution, much to the surprise of those who had just seen that the cabinet was empty.

After this it was considered advisable to send an assistant inside to sound the walls and prove that nothing was hidden; but no sooner had he stepped in than the exhibitor banged the door and shut him in. Contrary to all expectation, he did not attempt to get out, there was no knocking on the door, all was quiet, until at last the lecturer, appearing a little anxious, gently rapped on the panel and called out, "Are you all right?" but no answer was returned.

One of the other assistants then threw open the door, and there was seen, not the assistant, who had gone in, but his skeleton, standing against the pillar in the centre of the cabinet. The horror-stricken exhibitor at once removed the melancholy remains and closed the door, when almost immediately a tap was heard, the door was opened, and out walked the assistant. A number of changes of this description were worked by means of this cabinet, but all on the same lines as the foregoing.

Now let us examine the cabinet and see how it was done. The whole secret lies in the fact that two mirrors are concealed in the sides of the cabinet, hinged at the back corners, and opening towards the centre post. They extend the whole height of the interior, and, when not in use, their reflecting surfaces are folded flat against the wooden sides, their backs being papered to match the rest of the cabinet walls.

It will be seen by this that, when their front edges rest against the centre post, they occupy the same relative positions as those under the table in the "Decapitated Head" illusion, and that, when looking into the cabinet, the back, which we fancy we see, is simply the reflection of the two sides.

This leaves a triangular space formed by the three points, the two back corners, and the post, hidden from view, in which one or more persons may be concealed.

To perform the changes described, the cabinet must first be prepared by placing at the back a skeleton and a programme boy, and shutting the mirror against the post to hide them. When brought before the public it at first appears empty, then as soon as the door is closed the pro-

gramme boy comes from behind the mirrors, carefully closing them again, and standing before the post. Next the assistant steps in and, the door being closed, changes places with the skeleton. The cabinet being opened and the skeleton being removed, the door is once more closed, when the assistant folds both mirrors back flat against the walls (into which they fit) and, tapping at the front door, makes his appearance. The cabinet is now clear, and any person may walk in and round the post without discovering the secret.

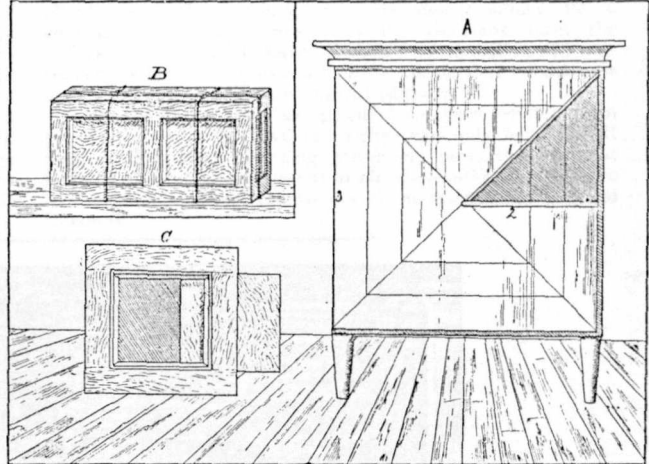


Fig. XXVI.

Another cabinet which has been much used by illusionists is represented at Fig. XXVI. In appearance it is something like a large wardrobe, excepting that it is raised on legs to about twelve inches above the level of the stage. Two doors form the front, and when these are opened the whole of the interior is exposed to view. It is often built of varnished pine with a few incised lines for ornament, which gives it a very bald appearance, and seems to leave no opportunity for concealment.

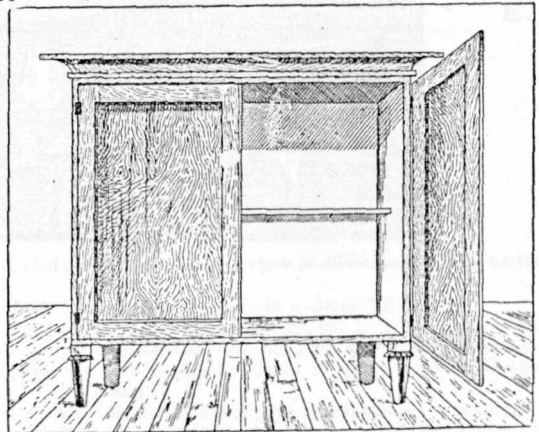


Fig. XXVII.

From side to side runs a shelf, which in width extends about half-way from back to front. Sometimes this cabinet is used in conjunction with a trunk for the performance of the "Great Box Illusion," which is worked in the following manner:—

Two or three persons having inspected the cabinet, of course, in vain, are invited to look at the box. It is a large panelled affair, as represented at (b) Fig XXVII., and an

assistant being placed inside, it is closed and corded as will be seen in the illustration.

It is then shut in the cabinet, and after an interval the doors are opened, the box is removed and uncorded, but on opening it the prisoner is found to have disappeared. The cabinet, which is fully exposed to the public gaze, and quite empty, is closed, but in a moment a knock is heard, and on opening the door once more out steps the assistant.

How this is accomplished a little explanation will show. In the first place the box, as I have said, is panelled, and at one of the ends the panel is made to slide out as at (c) Fig. XXVII., so that the person inside finds no difficulty in pushing aside the cord and issuing forth. It is then closed with a spring, and the next operation is to lie down on a shelf 2 (A), Fig. XXVII. He then reaches to the roof and lets down a mirror No. 1 (same diagram), which is hinged at its back edge, the front edge being lowered until it rests on the edge of the shelf, when being at an angle of forty-five degrees with regard to both the top and the back of the cabinet, it

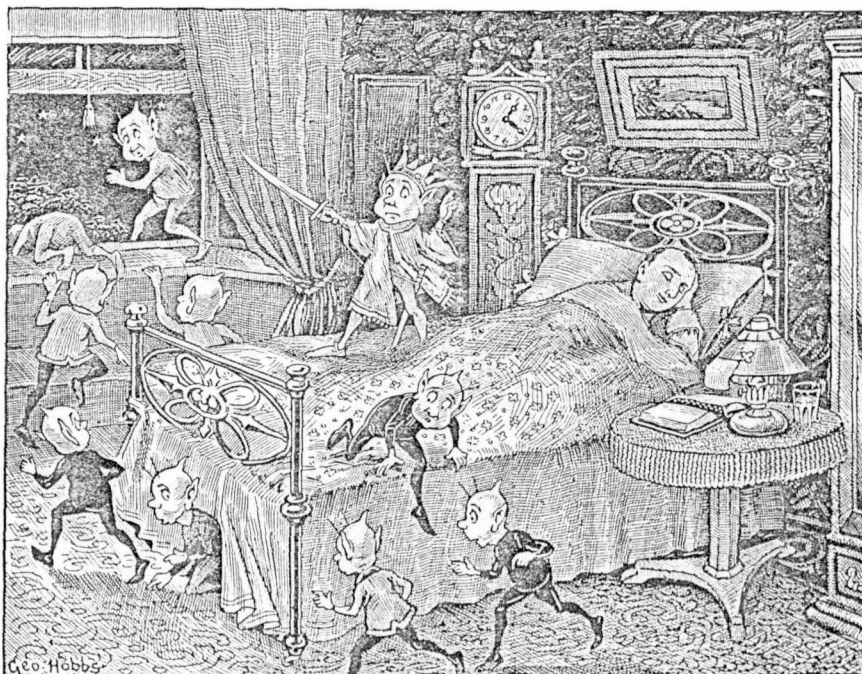
reflects the top in the place of the back. Behind this mirror the assistant lies concealed until, the doors being closed, he pushes the mirror back into its former place, and taps at the door to be let out.

I might multiply the different ways in which these cabinets can be used; but I think that these short expositions of the principles upon which they are arranged will explain to the readers all they wish to know.

The magnitude of this subject and the numberless applications of these principles would almost induce me to continue this article into what the Germans term the "Ewigkeit"; but I have already trespassed upon our reader's attention for such a lengthy period that I must now say "Good-bye to Modern Optical Illusions."

All the foregoing descriptions have been written from personal observation, and the writer can only hope that if they do not teach anything absolutely new, they may at least be of interest and benefit to all who—either for pleasure or for profit—interest themselves in the science of "Optical Illusions."

THE
EDITOR'S



NIGHTMARE.

One night the great Will Goldston left his window open wide, And, as he slept, the Brownies very softly crept inside.

Said one: "We have waited ages for a splendid chance like this. And to see this rascal punished is a sight I would not miss.

"For each month in 'THE MAGICIAN' he gives several tricks away,

And dissects our smartest dodges till they're all as plain as day, And assisting him are artistes, who have won an evil fame,

For a kind of plan-like drawings done to give away the game. "In his books, the 'LATEST CONJURING,' and 'SECRETS OF

MAGIC,' too,

Also in his other works he has done all he can do To make our secrets public, but we've got him now in bed,

And we'll end his vile existence with a hard knock on the head."

Said another: "That's too easy, far too painless, tame, and quick,

Let us all cut rashers off him, one good slice for every trick."

Cried another: "Make a stew of all his books, and make him drink,

And, for a finish, boil him in a copperful of ink."

But just then, on the window-sill, the Brownie King appeared, A powerful potentate was he, and for his magic feared.

Said he: "Why this intrusion in the great Will Goldston's house?

Be off at once each rascal, go as quietly as a mouse. "Don't you know this wondrous being is the one to whom I owe

Firm friendship and deep gratitude for all the tricks I know? It was through studying his books that I learnt everything,

And at length became so clever that you wisely made me king. "Do you think the general public care to read how tricks

are done?

I won't argue with such boobies! Let me see you cut and run But if anybody stumbles, or is noisy in his tread,

I am very much afraid that he'll go home without a head."

GEORGE E. HOBBS.

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