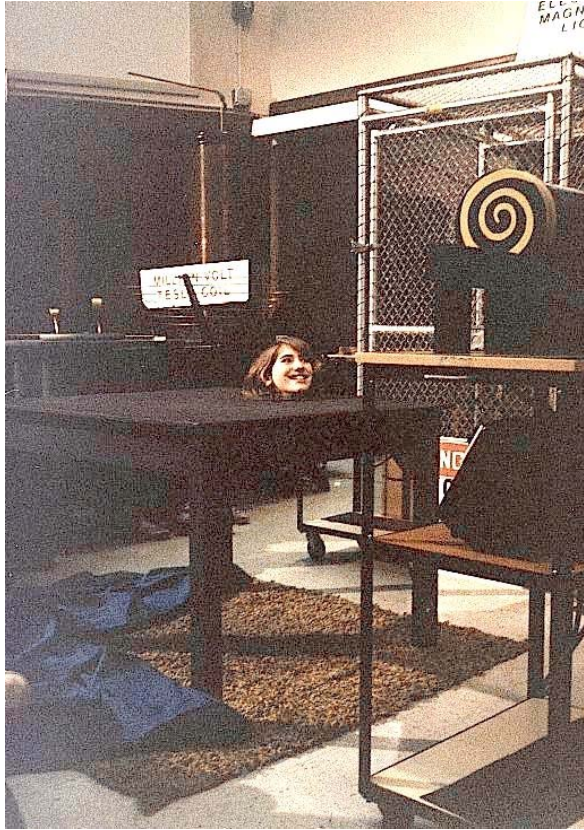


Talking Head



Reflections from a mirror mounted beneath a table give the illusion that a disembodied head is sitting on top of the table.

MATERIALS

- table, about 1-meter-square with circular hole near the back
- mirror to fit diagonally between opposite legs of the table
- table cloth reaching to the floor on all sides
- shag carpet or straw (optional)

PROCEDURE

The mirror is mounted underneath the table so as to cover the whole space from the under side of the table top to the floor[1]. A shag carpet or straw on the floor helps conceal the bottom edge of the mirror. Near the back of the table in the center and behind the mirror, a circular hole is cut through the table top of sufficient diameter to pass the head of the subject.

The table is initially covered with a cloth that reaches to the floor on every side.

A volunteer is taken from the audience around to the back of the table by an assistant who helps the volunteer kneel or sit with the head protruding through the hole in the table while the demonstrator, who at this point emulates a magician, holds the tablecloth in such a way as to conceal from the audience what is happening to the volunteer.

A little patter about the similarities and differences between science and magic fits in well here. A few grunts and groans from behind the cloth add to the drama. Finally, when the volunteer is in place, the cloth is removed, and the audience is presented with the illusion that a disembodied head is resting on the table.

One can carry on a conversation with the head, culminating perhaps in a pun about restoring the body while the victim is "ahead." In a magic show, the volunteer would be removed from the table, and the audience would be left to wonder how it was done. However, in a science demonstration, the volunteer should be removed in view of the audience while the demonstrator explains the trick.

The illusion is most effective if the mirror is very clean and its edges are concealed. The table should be placed well away from other obstructions that would be eclipsed by the mirror. If a carpet is used, it must be aligned carefully so that there is no discontinuity at its edge where it goes behind the mirror.

One should be careful not to stand directly in front of the table lest the reflection of one's legs be seen in the mirror. The table should not be placed too close to the audience to avoid reflections of the audience. The illusion works best if the audience is seated slightly above the level of the top of the table. The proximity of the audience to the head would seem to favor discovery of the trick, but, on the contrary, it is indispensable to its success.

DISCUSSION

Although this demonstration is more amusing than educational, it serves to introduce, motivate, and illustrate the idea that the angle of incidence is equal to the angle of reflection in geometrical optics. It also illustrates the danger of being deceived in making observations of nature and of the importance of considering all possible explanations of a phenomenon before reaching a conclusion.

HAZARDS

There are no significant hazards with this demonstration. Care should be taken when moving the mirror to avoid breaking it, and the volunteer should be cautioned not to lean or push against the mirror.

REFERENCE

1. D. H. Charney, *Magic*, Strawberry Hill Publishing Company: New York (1975).