

PSYCHOLOGY

Your Eyes Fool You

Things are not always what they seem. Parallel lines appear to bend. Twin circles seem to be different sizes. People sometimes have trouble walking on an even floor.

See Front Cover

By MARTHA G. MORROW

► THINGS ARE not always what they seem. Your mind cannot always believe and trust what your eyes seem to see. Flying saucers are but one of the many sights that puzzle us.

An inch is a standard of length. Yet one inch can be made to look longer than another. To test this, draw a line exactly an inch long on a sheet of paper. At the middle of this line, extend upward and perpendicular to it another line exactly an inch in length. Do the two lines appear equal? Ask friends to spot the longer one and they will invariably point to the upright line.

Twin circles seem to be of a different size when one is surrounded by a dozen or so tiny dots, and the other has only four or five large circles around it. Parallel lines seem to bend when crossed by lines radiating from a nearby point.

Simplified drawings of an open book or stairs will seem to shift before your eyes. Look fixedly at them for a time, then blink or concentrate on another section of the figure, and they begin to shift back and forth. These are just a few of the optical illusions we come across in our daily lives.

Warped Mirror for Fun

If you have tried on a friend's glasses recently, you probably noticed how the lenses distorted objects seen through them. If they happen to be greatly warped lenses, they can make the walls of a room appear uneven, and a bookcase slope so drastically you wonder why the books do not slide off. They can even make water appear to flow uphill. Warped mirrors in "fun houses" seem to make you grow or shrink as you stare first in one and then in another. Others are designed to make you look deformed.

Even without mirrors or glasses, however, we often fail to see things exactly as they are or as they are related to each other. Only part of what we perceive comes through the senses from the object, the rest is "read into" it by our minds in the light of previous experiences.

Our minds are largely responsible for our illusions. Our past experiences, associations, desires and imaginings create illusions. Many illusions are caused by errors in judgment.

You, I and everyone else are in the habit

of assuming things as normal. Because we are used to rooms with untilted floors and walls of uniform height perpendicular to the floor and ceiling, a slightly warped room may look normal. But this same distorted room may make the people and objects in it look out of proportion, and make the laws of gravity seem to be misbehaving.

Several tilted rooms have been built throughout the country as tourist attractions. Screams and wild laughter emerge from these rooms as people struggle to make their way across the sloping floor. Yet a guide, more accustomed to the crazy angle of the room, can walk up one of the walls if the room is tilted far enough.

Part of Scientific Project

Another kind of distorted room, with uneven walls and a sloping ceiling, makes you appear to grow larger or smaller as you cross the level floor. It is the room that is distorted, but in such a clever manner that it is you who appear out of proportion.

This particular type of distorted room was not built for fun, but as part of a serious scientific project. Designed by professors at the Institute for Associated Research at Hanover, N. H., it is helping psychologists understand why we are so easily fooled by what we think we see.

A miniature model of this distorted room was designed at the institute specially for THINGS of science, published by SCIENCE SERVICE. Easily assembled at home, it demonstrates how easily your eyes trick you.

The pattern, to be backed with cardboard and folded into shape, resembles a doll's house when assembled. But what a lopsided house it is, with one wall twice as large as the wall opposite. Windows are varying sizes and shapes, large and small, rectangular and trapezoidal. But the tiny room has been so perfectly designed that it looks quite normal when you peep into it.

Place twin dolls against the distorted windows, however, and the one near the smaller window appears to tower over its duplicate, as shown on the cover of this week's SCIENCE NEWS LETTER. Cut out the windows and place one doll behind each, then the face of one doll will seem to be much larger than that of the other. Your thumbs, when seen through the windows, will appear unmated.

Another object designed at the institute to fool you is the so-called "rotating win-

dow." This window frame is trapezoidal in shape so that even when facing you squarely, it appears at an angle. When slowly rotated in front of you, it seems to swing from side to side.

Intriguing to watch and fun to experiment with, these various devices and rooms help psychologists discover how much of what we see is contributed by our eyes and how much is due to interpretation by our mind based on past experiences.

Psychologists Study Reactions

A wide variety of demonstrations, including some of those mentioned above, is on exhibit at Princeton University, Ohio State University and Dartmouth College. Here psychologists study the reactions of students and other visitors.

The scientists find that the nature of what is perceived is not necessarily a true reflection of the existing physical environment. It is only an interpretation based upon all the previous experiences the observer has had. The actual physical object may not be at all as you "see" it.

The demonstrations show strikingly that there is more to behavior than just your reaction to your immediate environment. At any moment, you must bring to bear all of your past experiences in sizing up what you see, and act accordingly.

A number of optical illusions or materials for creating them have been collected for you by Science Service. Fourteen misleading drawings, twin figures that look different, several shifting designs, pattern of a miniature distorted room, warped lens and trapezoidal window cutout are included in a kit, complete with suggested experiments, which you can secure for 75 cents or three kits for \$1.50. Write Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the Optical Illusion kit.

Science News Letter, December 6, 1952

INVENTION

Patent Device To Lock Too-Stuffed Auto Trunk

► WHEN YOU stuff the back trunk of your car so the lid will not close, an invention by Walter D. Gardels, Kansas City, Mo., will enable you still to lock the trunk. Hook elements, at each end of a strong bar, are shaped to fit the locking portions of the trunk lid and the body of the car, and can thus be locked into position. Different kinds of hooks must be made for different models of cars. Patent number is 2,618,497.

Science News Letter, December 6, 1952

More *menhaden* are caught in the United States each year than any other fish; they are used principally as fertilizer and as source of oil needed by the leather, steel and linoleum industries.