

THE STRAIGHT DOPE

Why do left and right reverse in a mirror, but NOT UP AND DOWN? —Paul Schumacher, Atlanta

Actually, left and right *don't* reverse, and that's why you see a mirror image. It may take a while before you appreciate the truth of this, but hey, you asked the question. Suppose you wrote the alphabet out on a strip of paper, starting with A on the left and finishing with Z on the right. Now pick up the paper and face it toward the mirror. Notice as you do so (and before you look in the mirror) that A is now nearest your right hand and Z nearest your left. Then look at the reflection: A remains on the right and Z stays on the left. By the same token, what was on top remains on top and what was on the bottom remains on the bottom. In short, no reversal has occurred. Sure, the letters are wrong-reading, but whose fault is that? Yours, you wacky guy, because you turned the paper around before you faced it into the mirror.

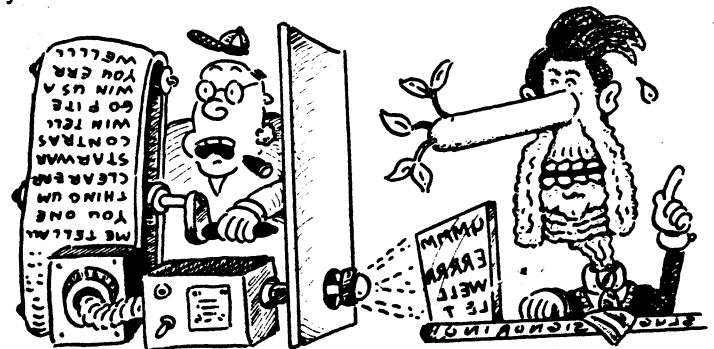
Confused? (Need I ask?) Let me put it a different way: For a reflected image to be right-reading, a perspective reversal must occur. That is to say, Mr. Mirror has to take the incoming image and transpose it before beaming it back out to you.

Flipping it right/left or up/down doesn't matter—it'll come out "normal" either way, if not necessarily right side up.) One way to accomplish this is with a curved mirror. A concave mirror curved along the horizontal axis (e.g., one mounted on the inside of an upright half cylinder) will produce a "normal" image if viewed straight on from the right distance. A concave mirror curved along both vertical and horizontal axes (e.g., the bowl of a spoon) will give you a double reversal—upside down, wrong reading. But let's not get into that. In short, it's not a physical problem we're talking about here, it's a mental problem. Guess whose.

When President Reagan makes speeches you often see two squares of glass mounted on stands on either side of the podium. What are they for? —Jim LeBlanc, Phoenix

They're teleprompters—you didn't think Ron actually memorized all those speeches, did you? The glass squares, which are called "beam splitters," are coated in such a way that they act as mirrors for the person at the podium while appearing transparent to people in the audience. They're carefully angled so that they pick up the text of the speech off TV monitors lying faceup on the floor and reflect it toward the speaker.

The whole business is orchestrated offstage by a technician who slowly reels a typed copy of the speech past a closed-circuit TV camera, which transmits it to the TV monitors and thence to the beam splitters and the speaker. This enables you to read your speech directly off the glass without having to glance down at the lectern, thus giving the impression that you're a bold, dynamic kinda guy who can maintain eye con-



tact with the audience. (Remember, the glass looks transparent from their side.) The fact that you can shift your gaze from one glass to the other adds to the illusion. The audience seldom tumbles to what's going on and figures the beam splitters are bulletproof shields or something. (They're not.)

Ron's teleprompters are supplied by a New York outfit called Q-TV, which also does business with many other politicians and corporate executives. The firm makes a similar gimmick for use on the cameras found in TV studios. Years ago, when the teleprompter was mounted above or to the side of the lens, you had to look slightly off camera to read the script, making it appear you couldn't stand to look anybody in the eye. Nowadays a beam splitter is mounted right in front of the lens. You can read your script while appearing to gaze directly into the camera like a man (or a woman, if that is what you happen to be). The glass is transparent when seen from the back and thus does not interfere with the normal operation of the camera. And here you probably thought all those ex-jocks-turned-commentators were geniuses because they never consulted notes when doing a stand-up intro. Ha. With most of those TV schmucks you'd have better luck getting an ad-lib out of Pinocchio.