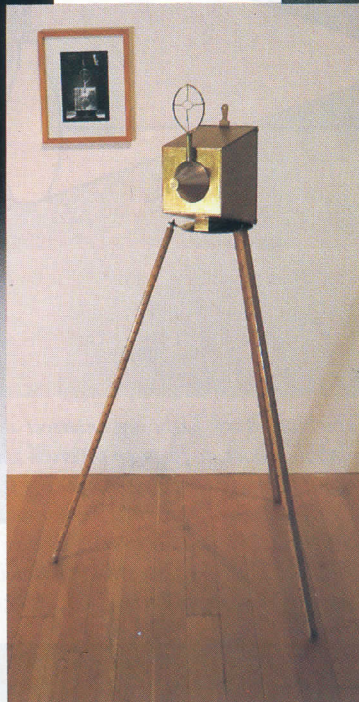
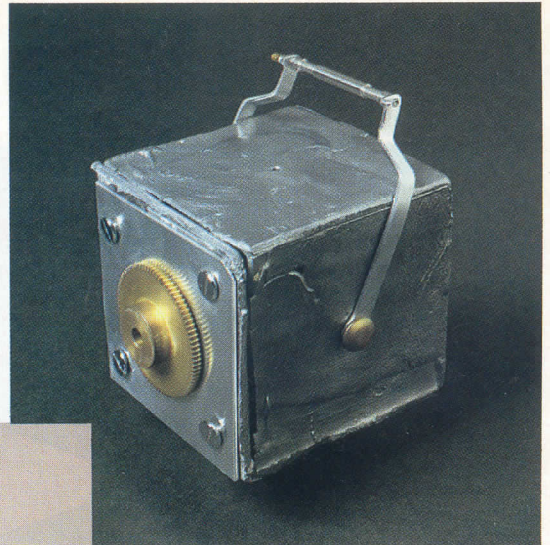


# Pinhole Primer

The art of the craft



Light travels in straight lines, and pinhole photography takes elegant advantage of this behavior. While a focused lens collects a wide cone of light rays and bends them back into a well-defined point on the camera's focal plane, a pinhole allows a relatively small number of rays from a given point to reach the film. Just as with a lens, however, these rays of light cross paths to form an inverted and reversed image of the subject. And just as with a lens, if you place a sheet of light-sensitive material in the path of that image, you can record it.

Actually, the pinhole admits a small bundle of light rays that expands as it proceeds to the film plane. That is one reason pinhole images aren't as sharp as pictures taken with a good lens. A smaller pinhole can produce a sharper image because it admits narrower bundles of light rays. (So can a shorter pinhole-to-film distance, because it limits the extent to which the bundles can ex-

*Cameras Obscura: San Franciscan Julie Schachter makes her pinhole cameras from found objects that comment playfully on her subjects. In addition to the portrait of Andy Warhol she shot with an industrial-size Campbell's soup-can camera (above left), she has photographed Death Valley with a Boraxo-can camera. Peggy Ann Jones of San Clemente uses everything from soldered brass (above) to lost-wax lead casting (top) to create her unique pinhole cameras. The nine-pinhole wooden model (right) produces a paper negative 54 inches long.*

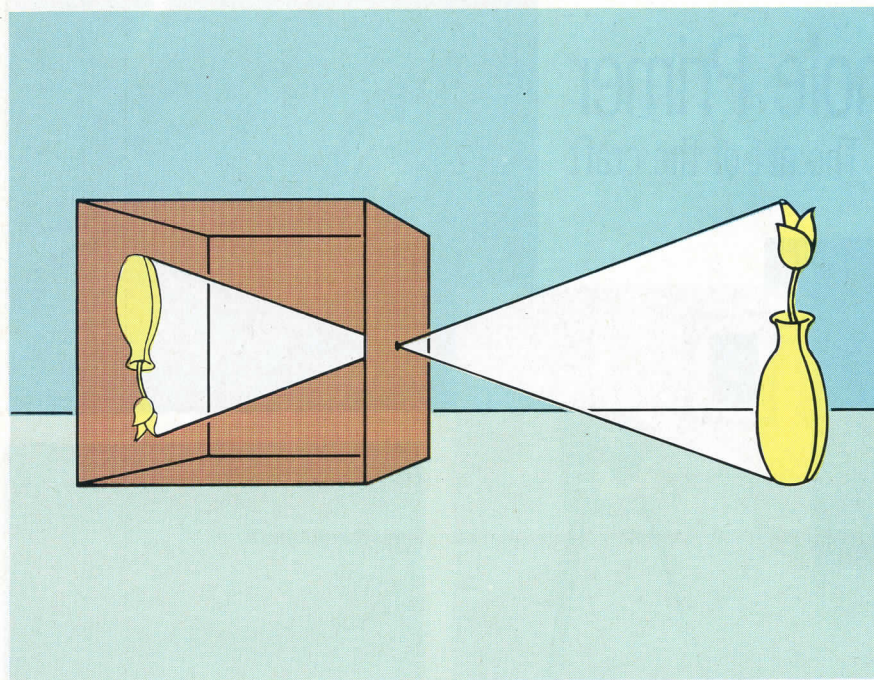
pand before striking the film.) But when the hole gets too small, diffraction—the bending of light as it passes over an opaque edge—cancels out the gain, reducing sharpness once again.

There is actually an optimal pinhole

size for every pinhole-to-film distance. Mathematically inclined pinholers have long since computed it, correlating its diameter with standard sewing-needle sizes, and the data is available in widely circulated charts that allow photographers to assign an f-number to their pinhole cameras. Still, many pinhole photographers renounce such science because they know that as long as a camera's pinhole isn't excessively large, they'll get a recognizable image. If they wanted critical sharpness, they would use a lens.

Pinhole photographers go to great pains to draw arcane distinctions between photography with a lens and photography with a pinhole. To be sure, a pinhole is an extraordinarily tiny ef-

## Closeup



fective aperture. Forget  $f/64$ : A typical pinhole  $f$ -number can run in the hundreds—say,  $f/426$ . But if you could set such a small aperture on a lens, the lens would provide the same enormous depth of field as the pinhole—not infinite, but deep enough to eliminate the need to focus.

Of course, a pinhole can't be focused anyway. A lens can only bring a subject into sharp focus when the film is placed a certain distance away from it, but with a pinhole the only practical consequence of changing pinhole-to-film distance is to change the camera's angle of view—making it wider when the distance is shorter and narrower when it's long. Pinhole cameras can range from ultra-wide-angle to "telephoto."

True believers in craft, pinhole photographers often lovingly hand-build their cameras out of wood, brass, and even more exotic materials (see examples). Those not manually inclined, however, frequently fashion their cameras from found objects. Eric Renner, founder of The Pinhole Resource, a clearinghouse for pinhole information

*The Hole Story: Light rays intersect at the pinhole, above, to form an inverted and reversed image of the subject on the film. The tiny aperture provides enormous depth of field, as shown in the picture below, a platinum print by 78-year-old pinholer Thomas Harding of Little Rock, Arkansas.*



and publications, has even used a red bell pepper. The pepper camera produced an unfogged negative in spite of its translucence because its red flesh acted as a natural safelight for the small

piece of black-and-white printing paper he'd placed inside.

Whatever their form, pinhole cameras range in size from Lilliputian to colossal. Jo Babcock of Berkeley, California, once turned his Volkswagen van into an ultra-large-format pinhole camera, making it lighttight and developing his enormous negatives inside. On the other extreme, when Canadian photographer Paul Cimon goes out to take pictures, he neatly packs dozens of small matchbox cameras into a suitcase. Each

**F**orget  $f/64$ : A pinhole's  $f$ -number can run in the hundreds—say,  $f/426$ .

matchbox is loaded with a single frame of 35mm film across from a tiny pinhole, and he simply uses a fresh camera for each shot.

New York painter turned photographer Marcia Sheer, at age 72 the grande dame of pinhole, is content to use cardboard cartons. (She bills herself as "Champion of Low Tech" on the announcements for her many pinhole exhibitions.) For her frequent photographic expeditions in and around Central Park, Sheer loads several cardboard cameras with  $16 \times 20$  sheet film, packing them all into a shopping cart. (She was once denied entrance to a restaurant because the hostess took her for a bag lady.)

Eccentric solutions to pinhole's logistical and technical problems are typical of the medium. Its practitioners seem to relish the challenge, going to extremes that more small-minded photographers would reject to create their evocative images. —RUSSELL HART

### Resources

*The Pinhole Resource is a clearinghouse for information about pinhole photography. Its director is photographer Eric Renner, who also publishes The Pinhole Journal, a fascinating critical and technical review, three times yearly. The Resource sells several different commercial pinhole cameras as well. Write or call for details: Star Route 15, Box 1655, San Lorenzo, NM 88057; (505) 536-9942.*