Pinhole Photography (with film)

Doing pinhole photos is more than just making a pinhole. Sorry about that.

First, the size of the image on the film will increase as the film-to-pinhole distance increases. Considering the pinhole as the lens, the image size on film increases as the lens is moved away from the film.

Second is the basic operation of a pinhole respective to physics. Pinholes transmit a very narrow beam of light rather than a single ray of light. The beam has the same diameter as the pinhole. Because the light is a beam, there is an optimum diameter of the pinhole. If the diameter is too small, you will get diffraction since the very narrow beam with spread out. Conversely, if the pinhole is too large, the beam is too large which significantly reduces sharpness.

The optimum pinhole diameter is computed based on the distance of the pinhole-to-film distance. The equation I have used is:

D=SQRT(d)/141 for computing the diameter in inches....or

D=SQRT(d)/28 for diameter in mm.

The equivalent aperture f number will be given by:

f=d/D

where D=pinhole diameter
d= distance of pinhole-to-film
f=equivalent f-stop number

A good example is for d=8 inches (I buy pinholes that are chemically milled in brass to precise diameters and then mount them on my Linhof flat boards).

At 8 inches, the correct pinhole diameter is 0.02 inch and yields and equivalent f number of f400.

Computing the f number is important to be able to determine exposure. Take a reading with a regular meter. Then, you multiply the exposure time by 4 for each doubling of the f number until the indicated pinhole f number is achieved. What you will find is that the exposure times are rather long--bringing into play reciprocity correction. But that is another matter.

The fact that the f number is so large, leads to the ability of having darn near everything in focus...from close up to infinity.