

# The Camera Obscura

## The History of the Pinhole Camera

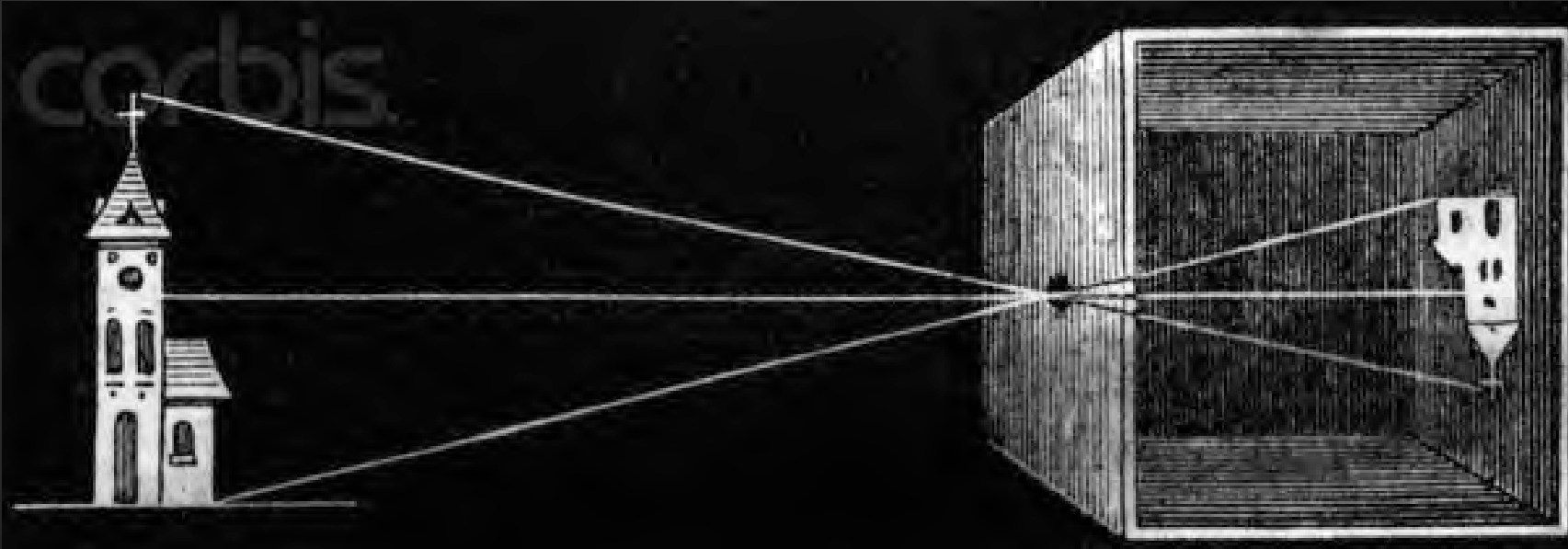
### **Learning Goals:**

- The history of the camera obscura
- How the camera obscura works
- Its various uses throughout the centuries
- The relationship between the camera obscura and drawing/painting
- Contemporary photo-based artists' applications of the camera obscura

By Marcine Linder

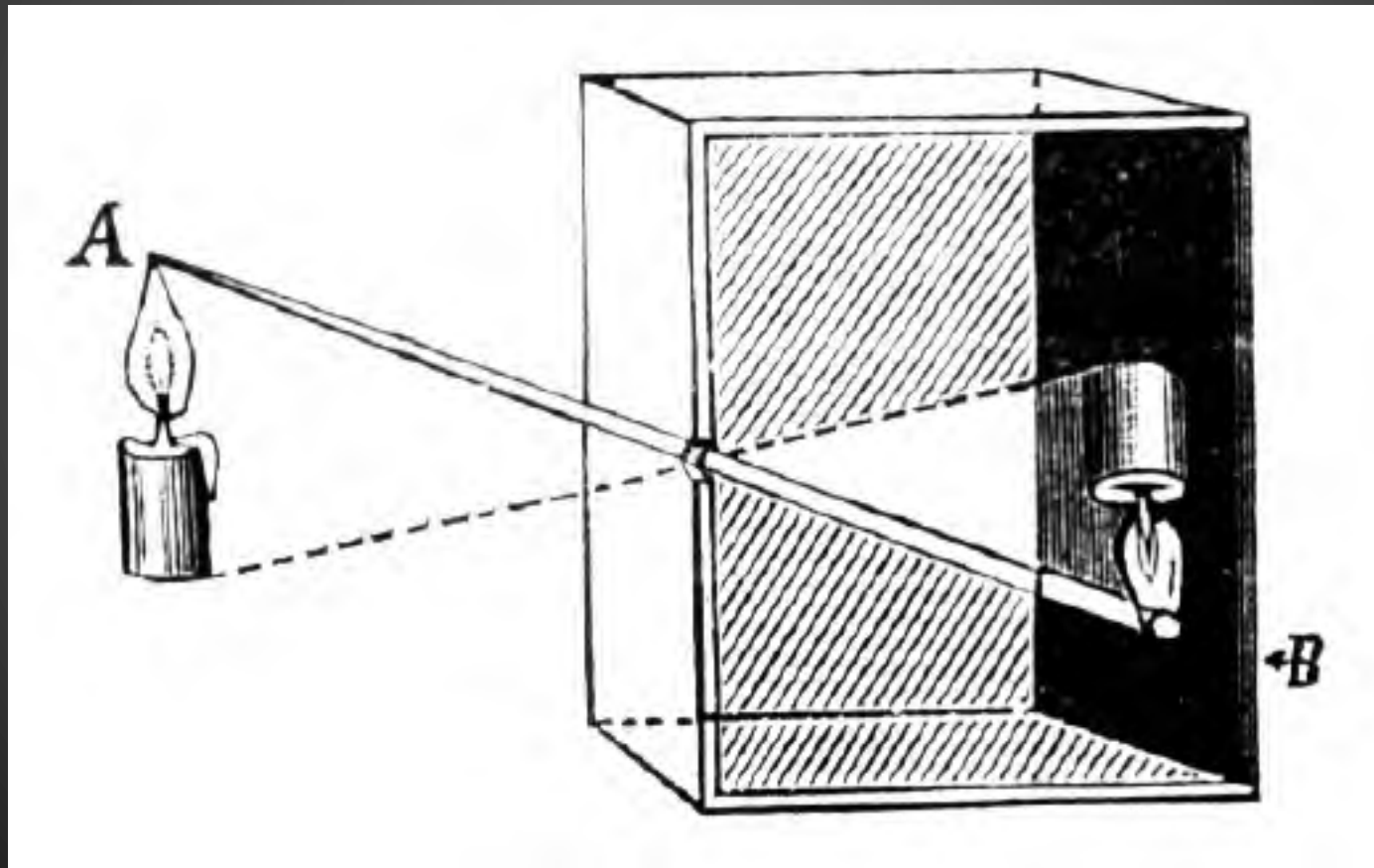
# camera obscura

- Comes from Latin
- means "darkened chamber"



# 2300 years ago....

The phenomenon known as the "camera obscura" was discovered in China and Greece



# Natural Camera Obscuras

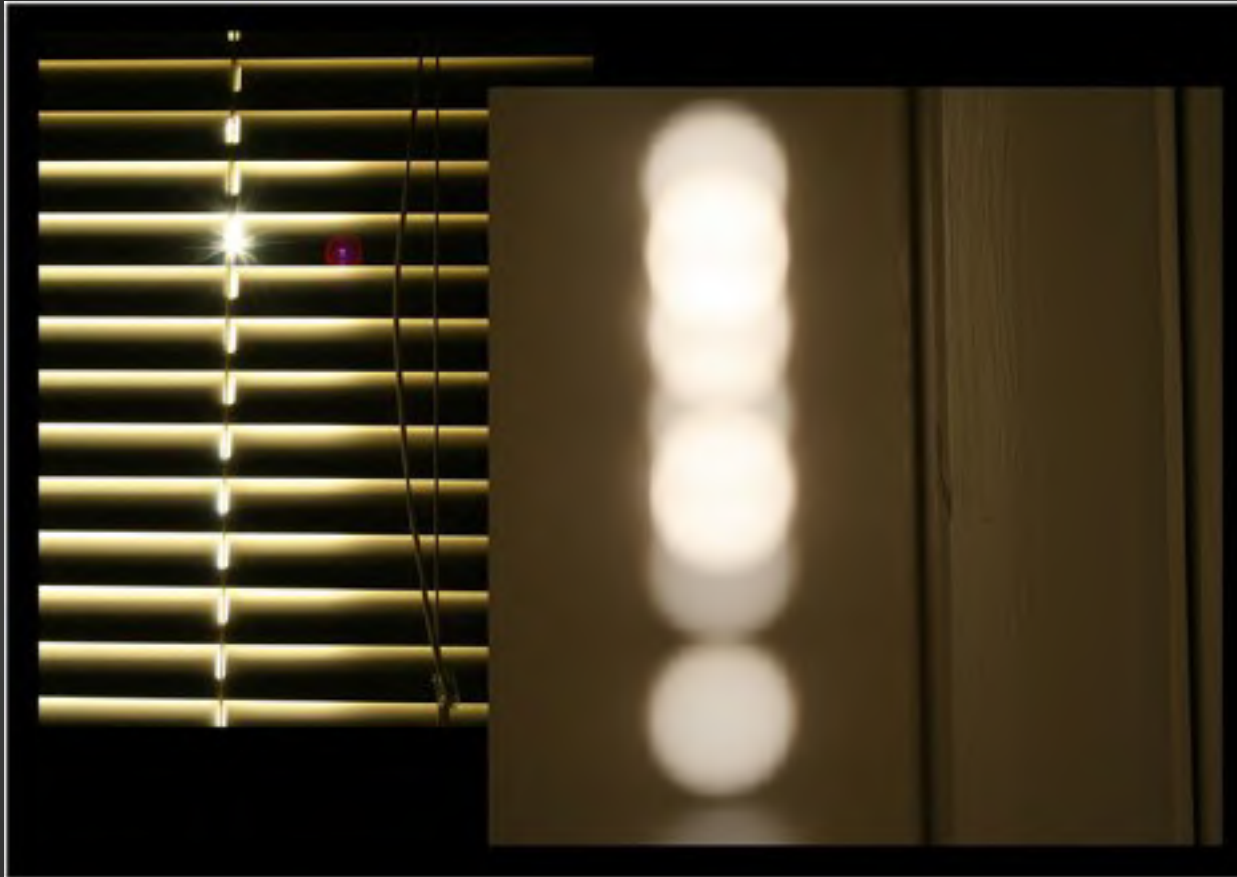


Observation of the phenomenon known as the “camera obscura” was first documented by scholars and philosophers in China and Greece when people sat in darkened rooms and noticed images projected on the walls from small holes on the facing side of the wall

Ancient pinhole camera effect caused by balistrias in the Castelgrande in Bellinzona

# Natural Camera Obscuras

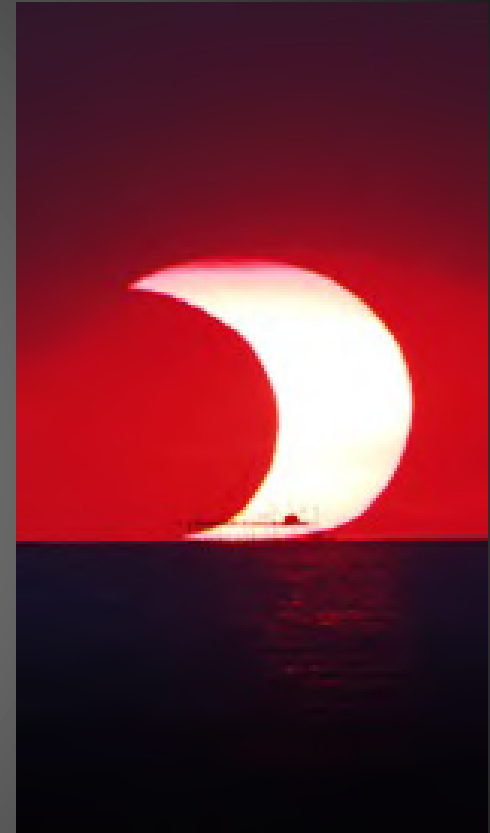
This is a composite of two images.



On the left, we see a point of light shining through a window shade

On the right we see multiple exposures combined into one image to show the sunlight from the window shade projected on a wall as it moved through the sky

# Natural Camera Obscuras

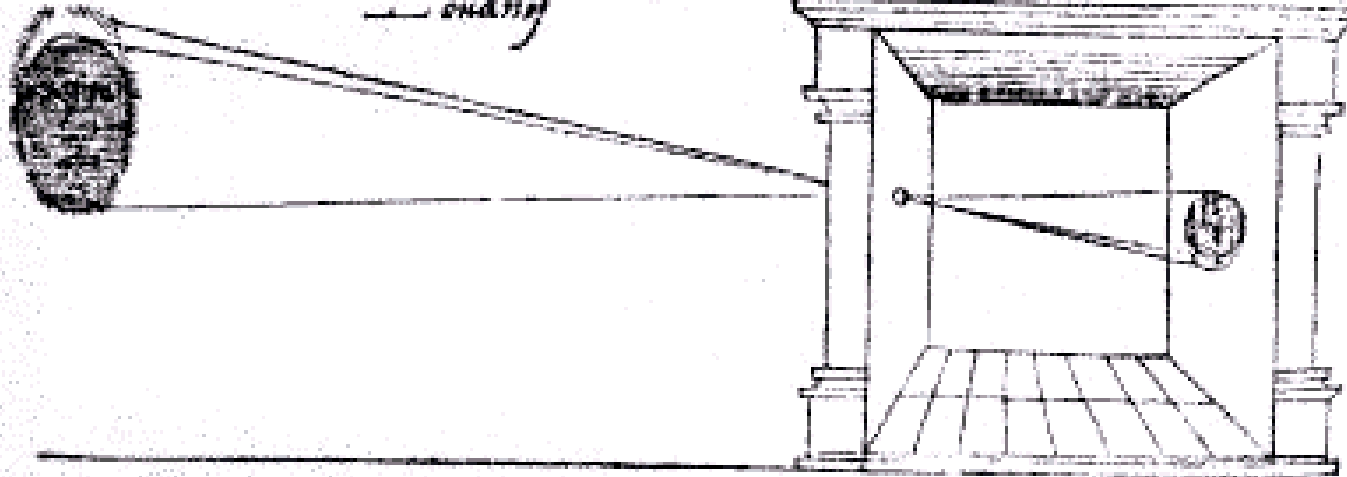


The crescent shaped light on the ground in the photo (on the left) was created naturally by sunlight filtering through a thick canopy of trees during a solar eclipse (on the right)

# Pinhole Cameras and Astronomy

illum in tabula per radios Solis, quam in cælo contingit: hoc est, si in cælo superior pars deliquiū patiatur, in radius apparebit inferior deficere, vt ratio exigit optica.

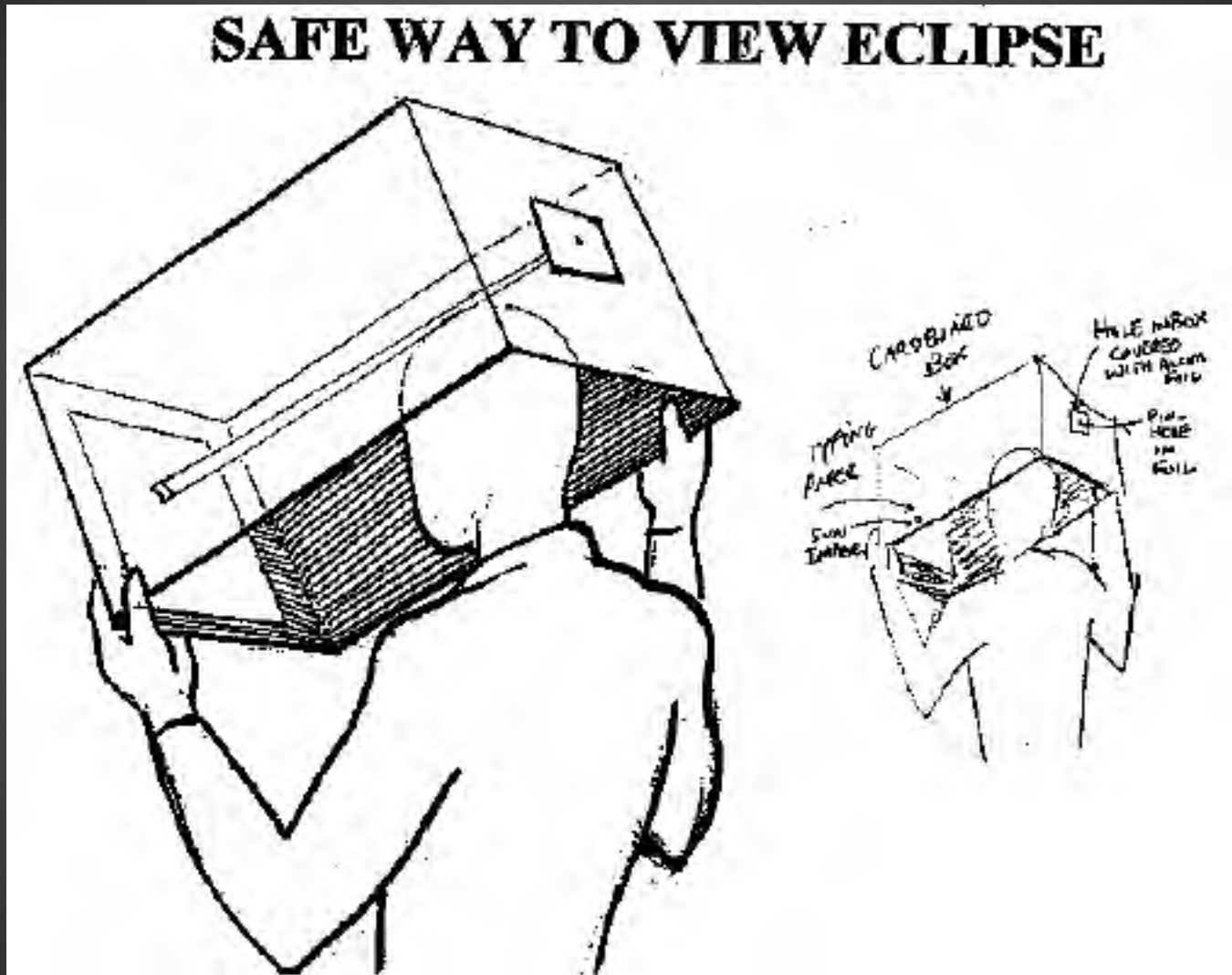
*Solis deliquium Anno Christi  
1544. Die 24. Januarij  
Louanij*



Sic nos exactè Anno .1544. Louanij eclipsim Solis obseruauimus, inuenimusq; deficere paulò plus q̄ dextantem, hoc est. 10. vncias siue digitos vt nostri locuun-

This diagram made in 1544, shows how camera obscuras were used to safely view solar eclipses (looking at them directly with the naked eye will cause blindness).

# Pinhole Cameras and Astronomy

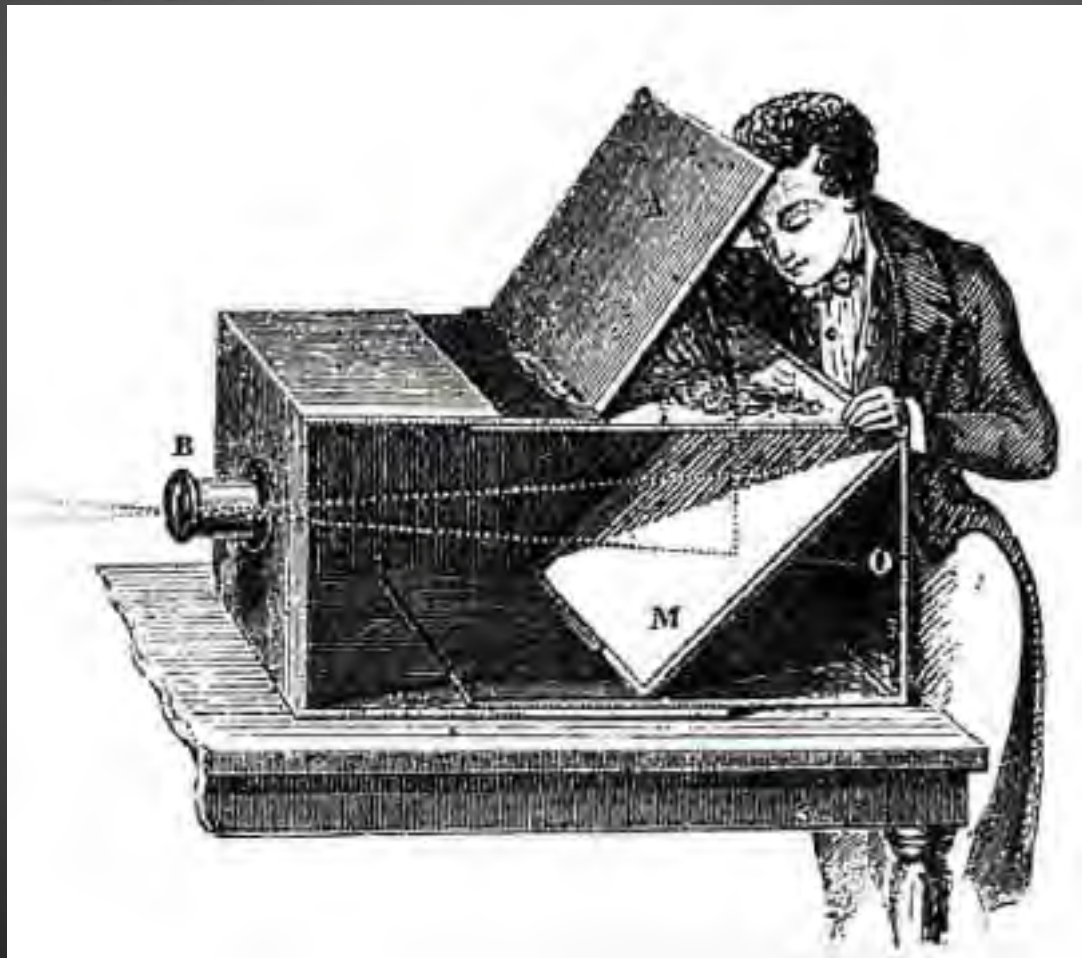


This is a modern diagram of how to use one.



## Before photography was invented.....

During the Renaissance (500 years ago) artists also discovered they could use camera obscuras to help them draw.



# Academic Drawing Instruction



Professional artists were trained how to meticulously copy master drawings and draw from life (and instruction of this type is still used today to teach students to draw photo realistically).

# The Transformation of Drawing Styles

Compare these paintings:



Massaccio (1426)

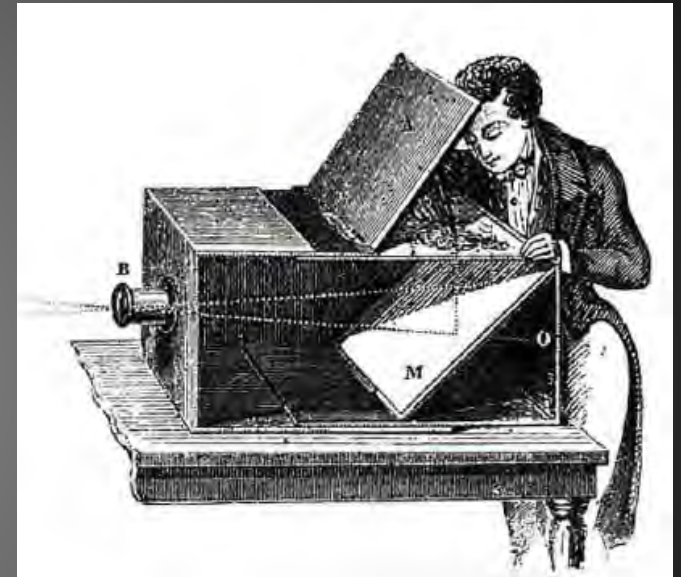


Gerrit van Honthorst (1623)

# Why do you think drawing skills improved during the Renaissance?



OR



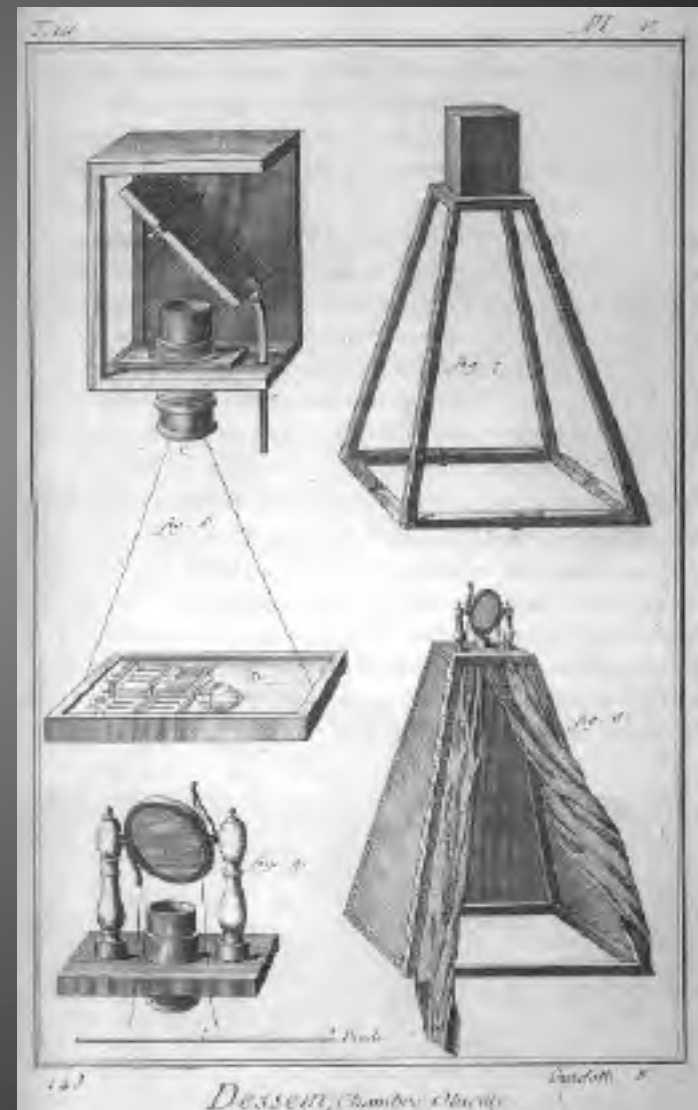
Why do you think this?

# David Hockney's Camera Obscura Theory

In 2001, David Hockney (a painter and photo-based artist), theorized that camera obscuras outfitted with concave mirrors were what was truly responsible for the evolution of of painters' drawing skills during the Renaissance.

He published a book and documentary on this called *Secret Knowledge*.

It shocked the art community and was very controversial.



# David Hockney's Theory



Most art historians reject Hockney's theory. It suggests that artists at the time "cheated" when creating their works.

Even in the present day, many artists can draw highly realistically without optical aids

His theory has also been attacked by artists as impossible from a technical standpoint and implausible by a visual psychophysicist

# All about David Hockney....

David Hockney is most famous for his photo collages called "joiners"



## All about David Hockney...



Multiple photographs are taken of an object, often from different angles and assembled together in a collage



# The Birth of Photography



Photography, drawing with light was not invented until 1839

Joseph Niepce invented the first photographic process and created this image, thought to be the world's first permanently recorded photograph.

**This picture took over 8 hours to expose!!!!**

# Inside a pinhole camera



On the right,  
a light bulb  
shines  
through a  
pinhole.

It is  
projected  
upside down  
inside the  
pinhole  
camera on  
the left.

*Light Bulb, 1991* by Abelardo Morell

# Modern Pinhole Photography



Pinhole photos taken using a box and modern photographic paper can need approximately 60 seconds of exposure time. The image on the paper taken with home-made cameras is often round, and when it is processed in the darkroom is negative

# Homemade Pinhole Cameras



- You can make your own pinhole camera using a shoebox or just about any box.
- The inside is painted black
  - The book is made light tight (meaning no light can get in)
  - A small square is cut out of the box and a piece of tin is attached to it using opaque black tape
  - A pin is used to prick a tiny hole in a piece of tin.

# Shooting with Pinhole Cameras



The photographic paper is loaded in the darkroom.

The camera is closed and the pinhole is blocked until the camera set in place to record an image.

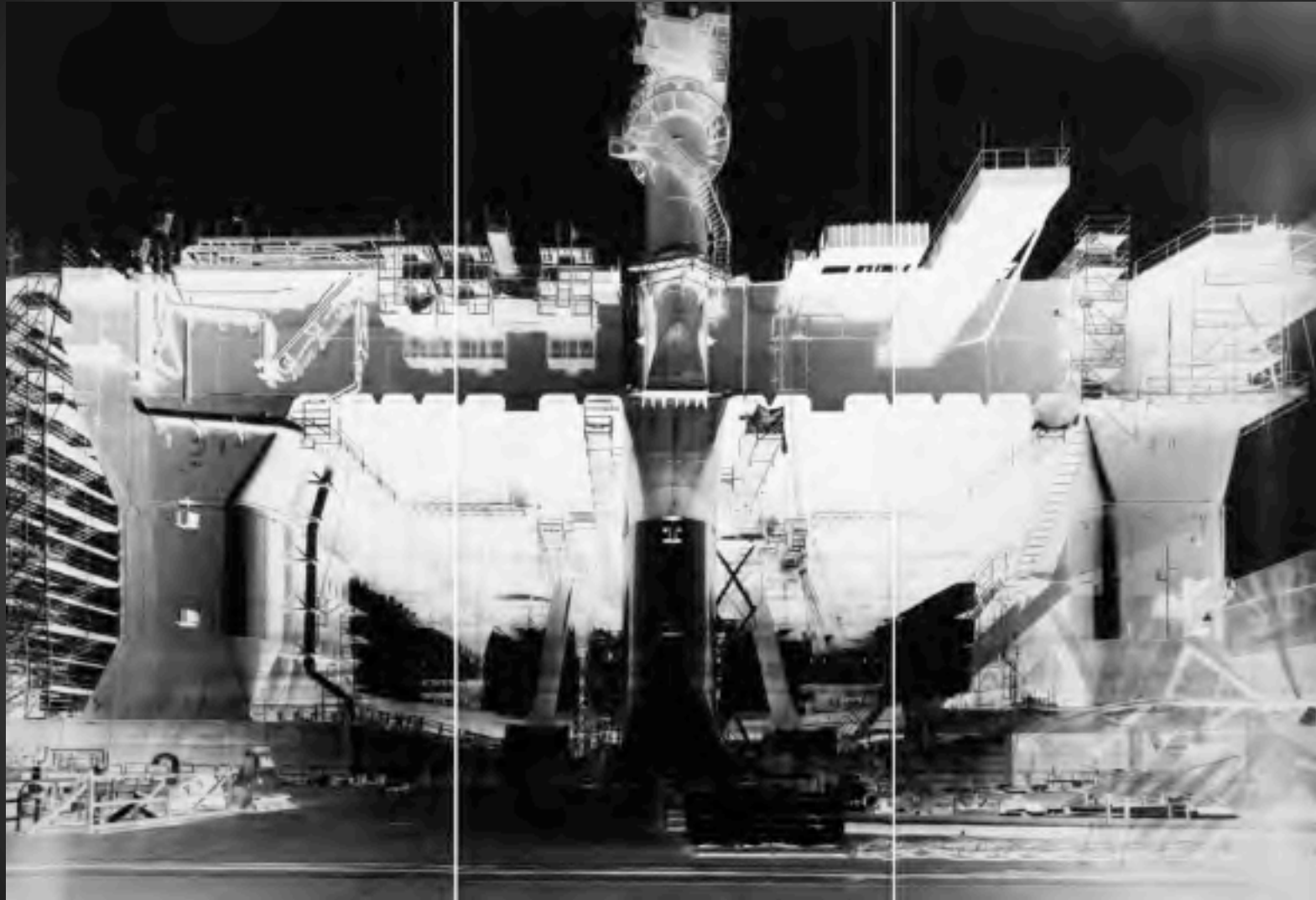
The pinhole is unblocked for the exposure and then blocked again when it is done

# Developing the Pinhole Image



The photographic paper is unloaded in the darkroom and processed in the darkroom chemistry the same way a print made using an enlarger would be

# Vera Lutter's Giant Pinhole Photographs



Kvaerner Shipyard, Rostock, IX: December 5, 2000 Series: Oilrig  
silver gelatin print 203.2 x 320 cm (6.6' x 10.5')

# Vera Lutter

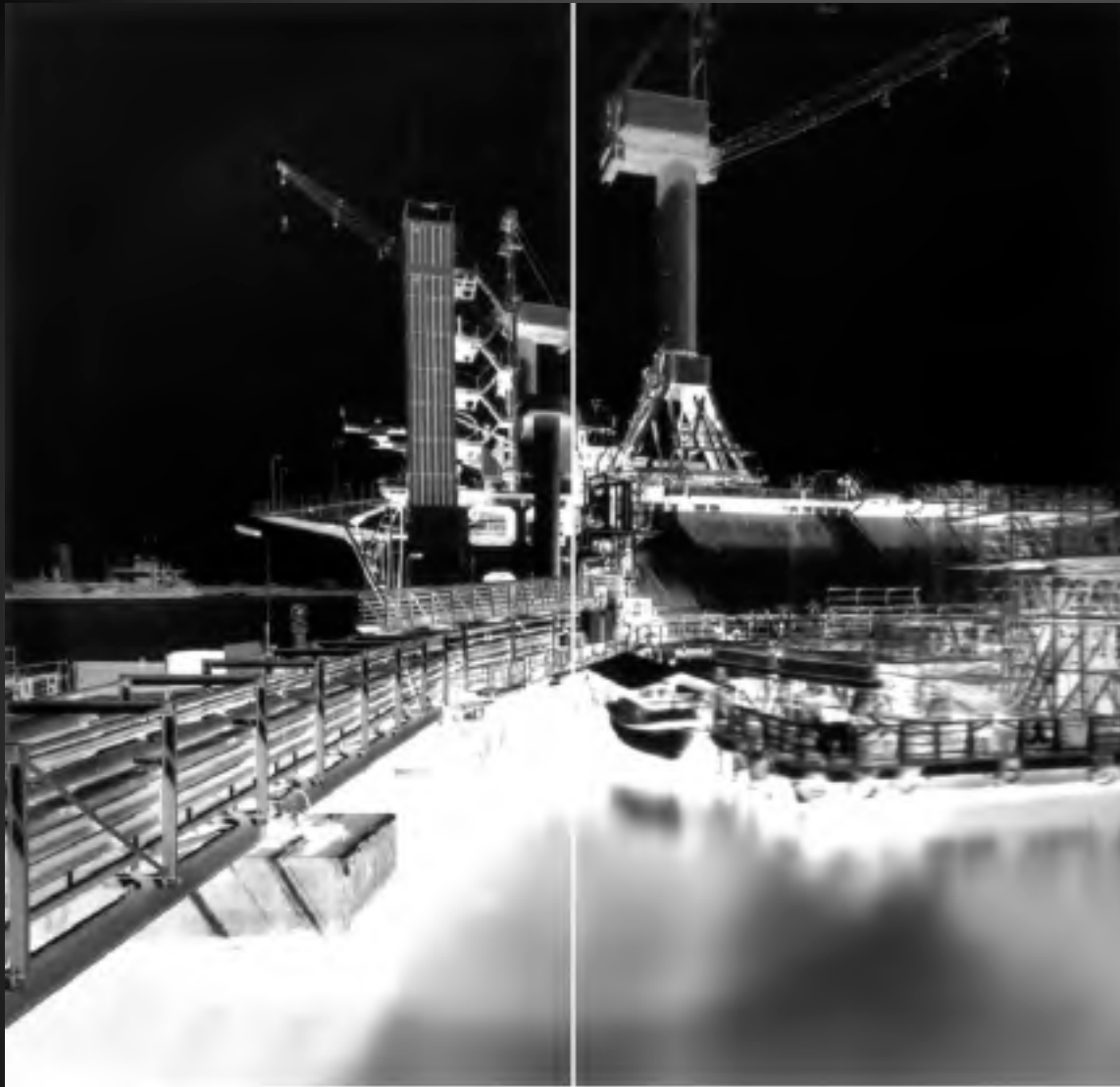
- Creates very large scale unique prints (there is no negative, and there is only one copy of each image) using giant camera obscuras
- Trained to become a sculptor in Munich
- Reached a point of crisis when she didn't know what direction to take with her work
- Moved to New York to attend school, and was inspired by the view from her illegal 27<sup>th</sup> story loft space to create a sort of conceptual installation piece by turning her loft into a giant **camera obscura**
- Her first ever image, sized as large as the wall in the loft, took five hours to expose
- Her huge sheets of sensitized heavyweight paper have to be very precisely rolled through gallons of photographic chemistry in troughs that are 60" wide in order for them to be evenly developed, a skill that took years to learn



Lutter's massive images force the viewer to reverse their perceptions of light and dark.



Pepsi Cola Interior, III: July 17 - 24, 2000  
silver gelatin print 233.7 x 426.7 cm



“The images are made all the more uncanny and indecipherable by ghostly traces overlapping transparent objects. This is the result of movement outside the camera during exposure” (Roberts, 2004)

Neptune Werft, Warnemünde, IV: August 1, 1997  
Series: Transportation Venues  
silver gelatin print 203.2 x 208.3 cm (6.6' x 6.8')

# Abelardo Morell's Pinhole-based Images



*Manhattan View Looking South in Large Room, 1996*

# Abelardo Morell



Morell applies the principle of the camera obscura on a large scale.

He can transform any room into a camera obscura by sealing the windows using black sheets of plastic and allows the light to enter through a hole less than one inch wide.

# Abelardo Morell

When the external landscape is reflected upside-down and reversed on the entire wall, he places a camera on a tripod, centers the wall in front of the window and shoots.



# Abelardo Morell

His early work was shot on film and took many hours to expose.



*Times Square in Hotel Room, 1997 (shot on film)*

# Abelardo Morell

He has since switched to shooting digitally which requires minutes instead of hours and allows him to capture more specific moments



*View of Times Square in Hotel Room, 2010(shot digitally)*

# Abelardo Morell



His stratified and somewhat abstract photographs are related to dreams, alter our perception of the landscape.

*The Brooklyn Bridge in Bedroom, 1997*



# Pinhole Portrait Assignment



Using the pre-made pinhole cameras from the classroom, create a dynamic portrait of one of your classmates with an interesting background.

Be creative in terms of how you pose your subject and what is seen behind them.

You are advised to find a background that is bright and has lots of contrasting details (such as shadows).

Keep in mind that your subject may have to hold his/her pose for 60 seconds or more

# Pinhole Portrait Assignment



## Grading Criteria:

Technical: to what degree is the image correctly exposed and processed with good contrast, rich blacks, and ample mid-tones

Aesthetic: How visually striking is the image? How well does it utilize the elements and principals of art

Critique: How well can the photographer "defend" the strengths and point out any weaknesses of image with reference to the elements and principals of art?