

tpo_44_passage_2

The precursor of the modern camera, the camera obscura is a darkened enclosure into which light is admitted through a lens in a small hole. The image of the illuminated area outside the enclosure is thrown upside down as if by magic onto a surface in the darkened enclosure. This technique was known as long ago as the fifth century B.C., in China. Aristotle also experimented with it in the fourth century B.C., and Leonardo da Vinci described it in his notebooks in 1490. In 1558 Giovanni Battista Della Porta wrote in his twenty-volume work *Magia naturalis* (meaning "natural magic") instructions for adding a convex lens to improve the quality of the image thrown against a canvas or panel in the darkened area where its outlines could be traced. Later, portable camera obscuras were developed, with interior mirrors and drawing tables on which the artist could trace the image. For the artist, this technique allows forms and linear perspective to be drawn precisely as they would be seen from a single viewpoint. Mirrors were also used to reverse the projected images to their original positions. Did some of the great masters of painting, then, trace their images using a camera obscura? Some art historians are now looking for clues of artists' use of such devices. One of the artists whose paintings are being analyzed from this point of view is the great Dutch master, Jan Vermeer, who lived from 1632 to 1675 during the flowering of art and science in the Netherlands, including the science of optics. Vermeer produced only about 30 known paintings, including his famous *The Art of Painting*. The room shown in it closely resembles the room in other Vermeer paintings, with lighting coming from a window on the left, the same roof beams, and similar floor tiles, suggesting that the room was fitted with a camera obscura on the side in the foreground. The map hung on the opposite wall was a real map in Vermeer's possession, reproduced in such faithful detail that some kind of tracery is suspected. When one of Vermeer's paintings was X-rayed, it did not have any preliminary sketches on the canvas beneath the paint, but rather the complete image drawn in black and white without any trial sketches. Vermeer did not have any students, did not keep any records, and did not encourage anyone to visit his studio, facts that can be interpreted as protecting his secret use of a camera obscura. In recent times the British artist David Hockney has published his investigations into the secret use of the camera obscura, claiming that for up to 400 years, many of Western art's great masters probably used the device to produce almost photographically realistic details in their paintings. He includes in this group Caravaggio, Hans Holbein, Leonardo da Vinci, Diego Velázquez, Jean-Auguste-Dominique Ingres, Agnolo Bronzino, and Jan van Eyck. From an artist's point of view, Hockney observed that a camera obscura compresses the complicated forms of a three-dimensional scene into two-dimensional shapes that can easily be traced and also increases the contrast between light and dark, leading to the chiaroscuro artistic term for a contrast between light and dark effect seen in many of these paintings. In Jan van Eyck's *The Marriage of Giovanni Arnolfini and Giovanna Cenami*, the complicated foreshortening (a technique for representing an image in art that makes it appear to recede in space) in the chandelier and the intricate detail in the bride's garments are among the clues that Hockney thinks point to the use of the camera obscura. So what are we to conclude? If these artists did use a camera obscura, does that diminish their stature? Hockney argues that the camera obscura does not replace artistic skill in drawing and painting. In experimenting with it, he found that it is actually quite difficult to use for drawing, and he speculates that the artists probably combined their observations from life with

tracing of shapes.

question 1

What can be inferred from paragraph 1 about Giovanni Battista Della Porta' s contribution to the camera obscura?

A He translated a Chinese description of the use of the camera obscura and made the technique available to artists.

B His convex lens made the projected image easier to trace.

C His version of the camera obscura allowed for the later addition of a mirror.

D His improvements relied heavily on design changes proposed earlier by Leonardo da Vinci.

question 2

Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

A One artist with a particularly interesting point of view about the use of the camera obscura in painting was Jan Vermeer, who lived in the Netherlands from 1632 to 1675.

B Historical analyses suggest that Dutch masters were interested in the science of optics, so they may have used the camera obscura to trace images.

C The use of the camera obscura is being analyzed in the paintings of Jan Vermeer, who lived in the Netherlands when art and science were flourishing there.

D One view held by historians is that most Dutch masters were as interested in art as they were in science, and that provides clues about the techniques used in their paintings.

question 3

What does paragraph 2 indicate about Vermeer' s The Art of Painting?

A It is the first in a series of about 30 paintings that he created.

B It may have been painted by one of his students.

C It was in his possession until his death in 1675.

D It has the same setting as several other works of his.

question 4

Why does the author provide the information that “When one of Vermeer’s paintings was X-rayed, it did not have any preliminary sketches on the canvas beneath the paint, but rather the complete image drawn in black and white without any trial sketches.” ?

A To provide an example of a way to learn about the practices of artists who did not keep good records

B To emphasize Vermeer’s confidence and skill as an artist

C To provide evidence that Vermeer may have traced the image using a camera obscura

D To argue that Vermeer did his preliminary sketching on paper, rather than on canvas

question 5

According to paragraph 3, Hockney believes that all of the following indicate use of a camera obscura EXCEPT

A very detailed, realistic work

B increased contrast between light and dark

C oversimplification of forms when the image is traced

D complicated foreshortening of objects

question 6

The word “intricate” in the passage is closest in meaning to

A surprising

- B complex
- C beautiful
- D clear

question 7

The word "diminish" in the passage is closest in meaning to

- A reduce
- B affect
- C reflect
- D determine

question 8

According to paragraph 4, what does Hockney argue about the use of the camera obscura in producing art?

- A Works produced using a camera obscura do not deserve as much respect as those produced without it.
- B The camera obscura was probably used primarily as a training device, rather than used in producing finished works.
- C Use of the camera obscura by Western art's great masters was probably relatively rare.
- D While the use of the camera obscura may have helped artists, they still needed to have significant artistic ability.

question 9

Look at the four squares [] that indicate where the following sentence could be added to the passage.

The precursor of the modern camera, the camera obscura is a darkened

enclosure into which light is admitted through a lens in a small hole. The image of the illuminated area outside the enclosure is thrown upside down as if by magic onto a surface in the darkened enclosure. This technique was known as long ago as the fifth century B.C., in China. Aristotle also experimented with it in the fourth century B.C., and Leonardo da Vinci described it in his notebooks in 1490. In 1558 Giovanni Battista Della Porta wrote in his twenty-volume work *Magia naturalis* (meaning "natural magic") instructions for adding a convex lens to improve the quality of the image thrown against a canvas or panel in the darkened area where its outlines could be traced. [] Later, portable camera obscuras were developed, with interior mirrors and drawing tables on which the artist could trace the image. [] For the artist, this technique allows forms and linear perspective to be drawn precisely as they would be seen from a single viewpoint. [] Mirrors were also used to reverse the projected images to their original positions. [] Did some of the great masters of painting, then, trace their images using a camera obscura? Some art historians are now looking for clues of artists' use of such devices. One of the artists whose paintings are being analyzed from this point of view is the great Dutch master, Jan Vermeer, who lived from 1632 to 1675 during the flowering of art and science in the Netherlands, including the science of optics. Vermeer produced only about 30 known paintings, including his famous *The Art of Painting*. The room shown in it closely resembles the room in other Vermeer paintings, with lighting coming from a window on the left, the same roof beams, and similar floor tiles, suggesting that the room was fitted with a camera obscura on the side in the foreground. The map hung on the opposite wall was a real map in Vermeer's possession, reproduced in such faithful detail that some kind of tracery is suspected. When one of Vermeer's paintings was X-rayed, it did not have any preliminary sketches on the canvas beneath the paint, but rather the complete image drawn in black and white without any trial sketches. Vermeer did not have any students, did not keep any records, and did not encourage anyone to visit his studio, facts that can be interpreted as protecting his secret use of a camera obscura. In recent times the British artist David Hockney has published his investigations into the secret use of the camera obscura, claiming that for up to 400 years, many of Western art's great masters probably used the device to produce almost photographically realistic details in their paintings. He includes in this group Caravaggio, Hans Holbein, Leonardo da Vinci, Diego Velázquez, Jean-Auguste-Dominique Ingres, Agnolo Bronzino, and Jan van Eyck. From an artist's point of view, Hockney observed that a camera obscura compresses the complicated forms of a three-dimensional scene into two-dimensional shapes that can easily be traced and also increases the contrast between light and dark, leading to the chiaroscuro artistic term for a contrast between light and dark effect seen in many of these paintings. In Jan van Eyck's *The Marriage of Giovanni Arnolfini and Giovanna Cenami*, the complicated foreshortening (a technique for representing an image in art that makes it appear to recede in space) in the chandelier and the intricate detail in the bride's garments are among the clues that Hockney thinks point to the use of the camera obscura. So what are we to conclude? If these artists did use a camera obscura, does that diminish their stature? Hockney argues that the camera obscura does not replace artistic skill in drawing and painting. In experimenting with it, he found that it is actually quite difficult to use for drawing, and he speculates that the artists probably combined their observations from life with tracing of shapes.

question 10

Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. This question is worth 2 points.

- A. Evidence that the use of the camera obscura has long been known is provided by its description in many sources, including works dating back to Chinese writers from the fifth century B.C.
- B. The camera obscura was most widely used by artists in seventeenth-century Netherlands, a period when art and science thrived.
- C. Some historians who have studied paintings by Western masters have found clues indicating that the masters may have secretly used the camera obscura in their works.
- D. The unique features of Vermeer's *The Art of Painting* make it unlikely that it was made with a camera obscura, as opposed to his other works.
- E. It is now widely believed that the use of the camera obscura led to the development of a style of photographic realism in Western art.
- F. The artist David Hockney has speculated that artists probably combined the use of the camera obscura with their own original observations from life.