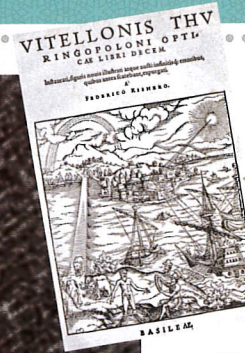


# 15 EYE-POPPING

# VISION FACTS



1 Much of what we know about the **eye and vision** was influenced by scientists in Muslim civilization, beginning in the **9th century**.

The scholars of Islam inherited **two theories about vision** from the Greeks. One said we see because our eyes send out visible, laser-like rays that make objects visible. The other said we see because something representing an object **enters our eyes**.

Figuring out how the eye works is one of the most outstanding **scientific legacies** of Muslim civilization.



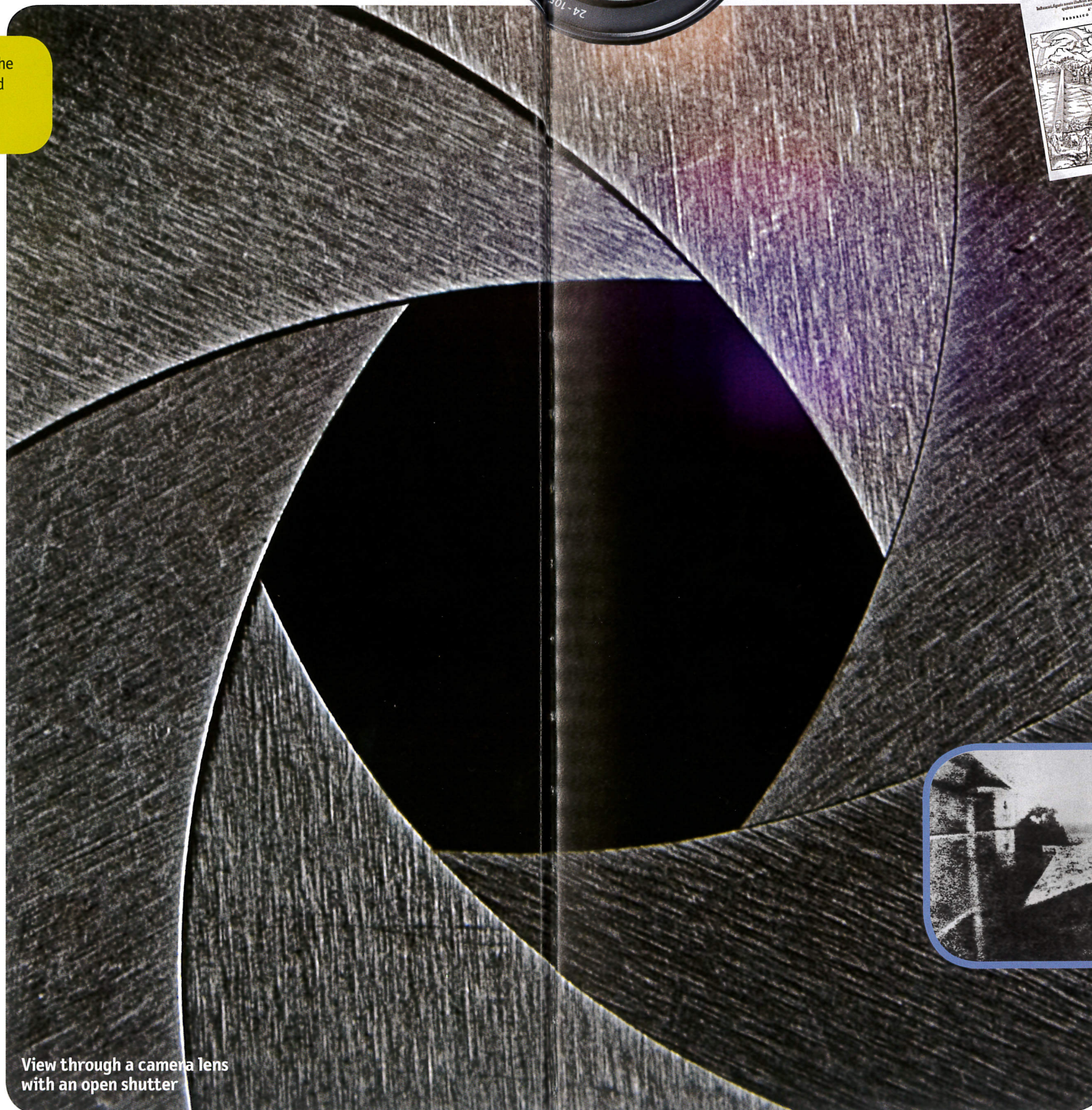
4 Ninth-century philosopher and scientist **Al-Kindi** was the first to lay down the foundations of **modern-day optics** by questioning earlier theories of vision.

5 Al-Kindi has been called "one of the **12 giant minds** of history."

One century later **Ibn al-Haytham**, a mathematician, astronomer, and physicist, used experiments to build on Al-Kindi's work and provide a more detailed theory of **vision**.

Al-Kindi's **meticulous experiments** helped Ibn al-Haytham prove that we see because of **light rays** coming from the objects, not from the eye.

**Scientific theories** were often accepted without proof. Ibn al-Haytham was among the first to use experiments to check theories. His *Book of Optics* is still a **brilliant example** of writing on the scientific method.



View through a camera lens with an open shutter

9 **Leonardo da Vinci** may have learned from Ibn al-Haytham's book after it was translated from Arabic into **Latin**.

10 Ibn al-Haytham experimented with the **pinhole camera** while under house arrest in Cairo, Egypt.



11 One day Ibn al-Haytham noticed that light coming through a **tiny hole** in the shutters projected an image of the **outside world** onto the opposite wall of his dark room.

12 After **discovering** that the smaller the hole, the more focused the light and the sharper the image, Ibn al-Haytham confirmed light travels in a straight line. This led to the **camera obscura**, a forerunner to the modern camera.

13 The camera obscura had a large, **dark chamber** the size of a small room with a pinhole opening for light to shine through. The image projected by the light was traced onto a drawing surface to **produce a picture**.



14 The **earliest** known surviving photograph was shot in **France** in 1827, using a camera obscura.

15 "**Camera obscura**" is the Latin translation of "**dark room**," as originally used by Ibn al-Haytham, which in modern Arabic is *qamara*.

