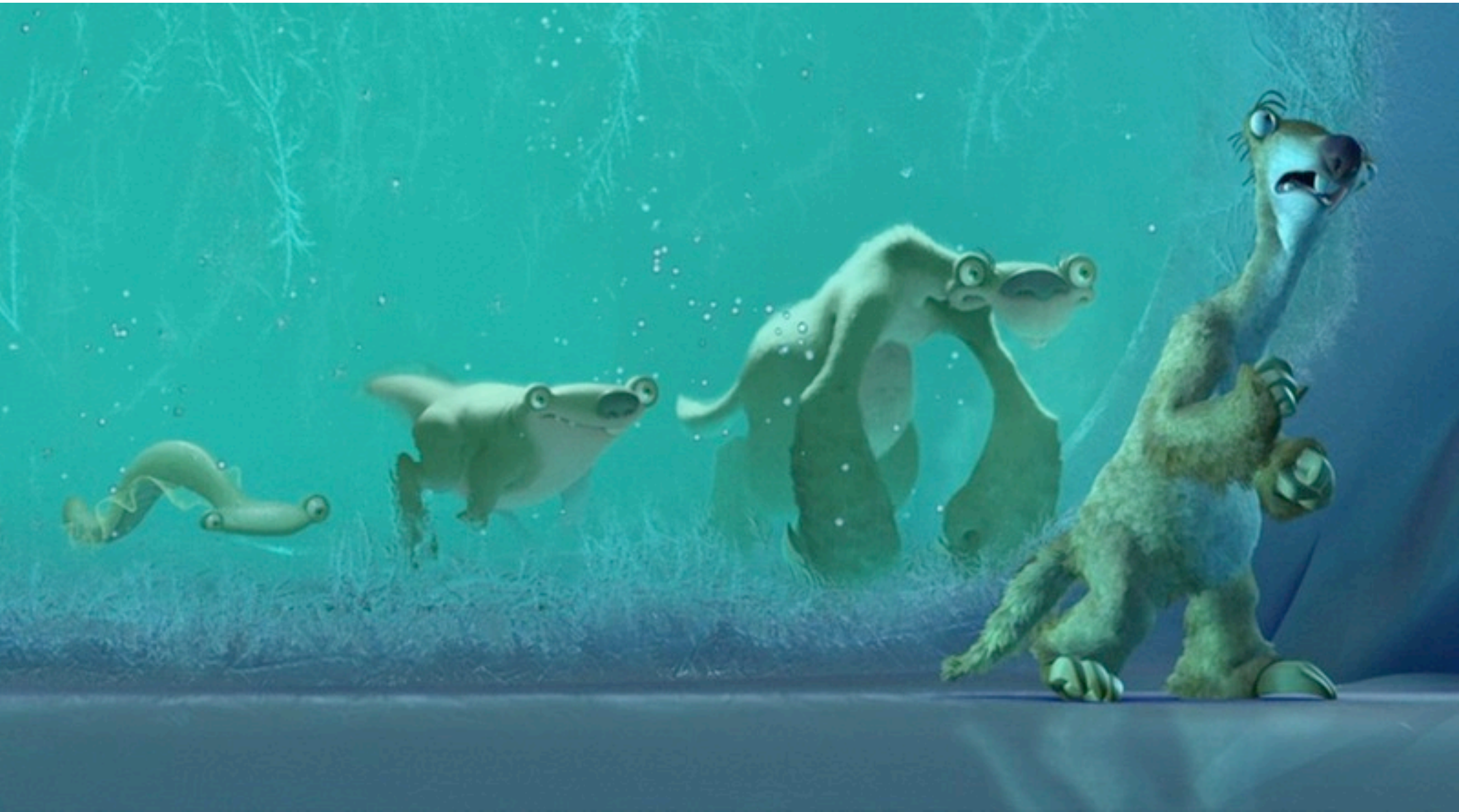
The Art of Graphics Programming

Week 1: *History of the Medium*

Patrick Hebron
NYU ITP - Fall 2012

"Any account of the cinema that was drawn merely from the technical innovations that made it possible would be a poor one indeed. On the contrary, an approximate and complicated visualization of an idea invariably precedes the industrial discovery which alone can open the way to its practical use."

André Bazin, *The Myth of Total Cinema*



Some Key Moments in the Pre-History of Computer Graphics

c.50,000 BC

Counting begins.

c.33,000 BC

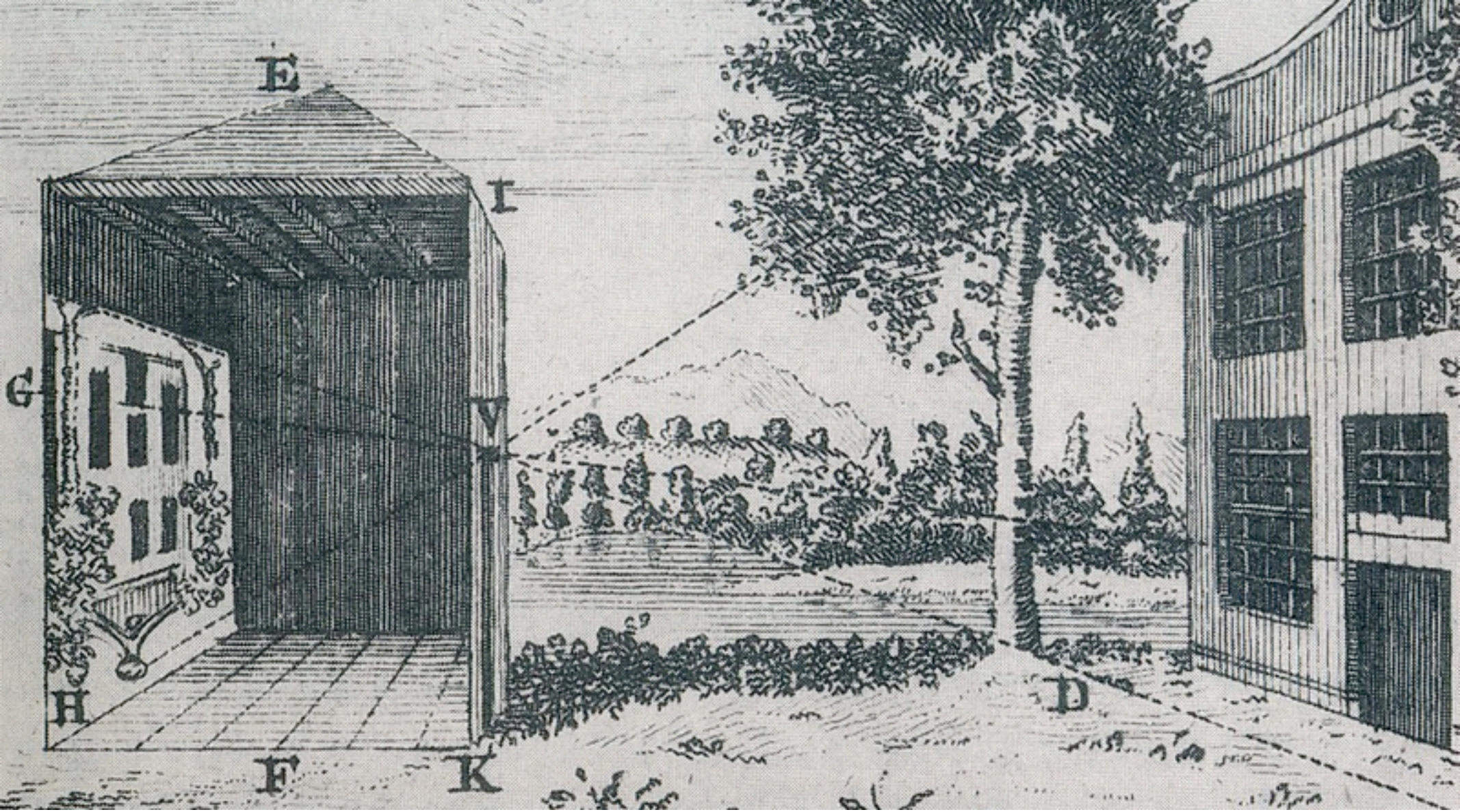
Chauvet cave is adorned with the earliest-known figurative drawings.

c.3,000 BC

Papyrus drawing, mummification and hieroglyphic numerals emerge in ancient Egypt.

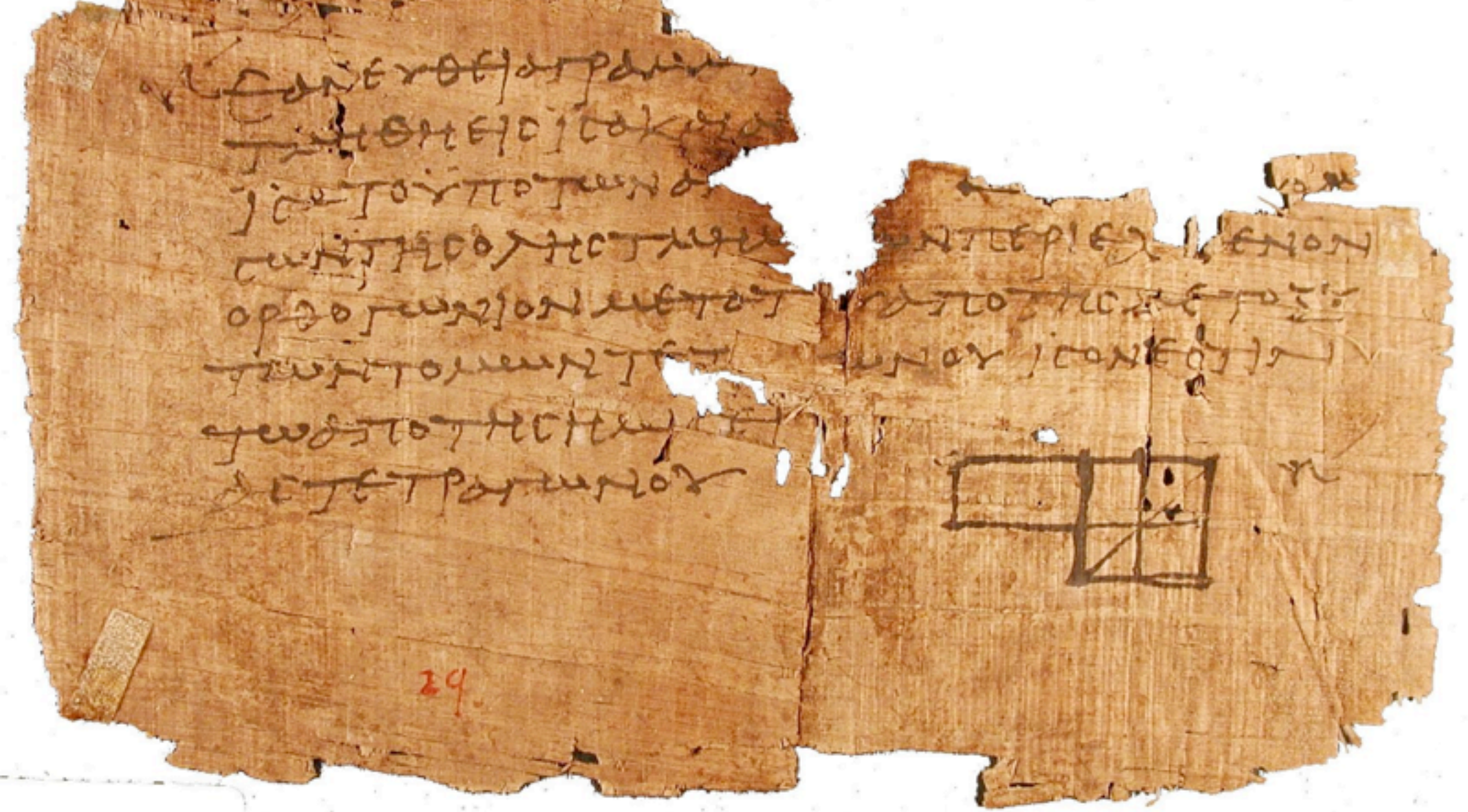
c.450 BC

Zeno of Elea formulates a set of seeming paradoxes concerning infinitudes.



400
BC

Earliest reference to the principles utilized by a camera obscura.

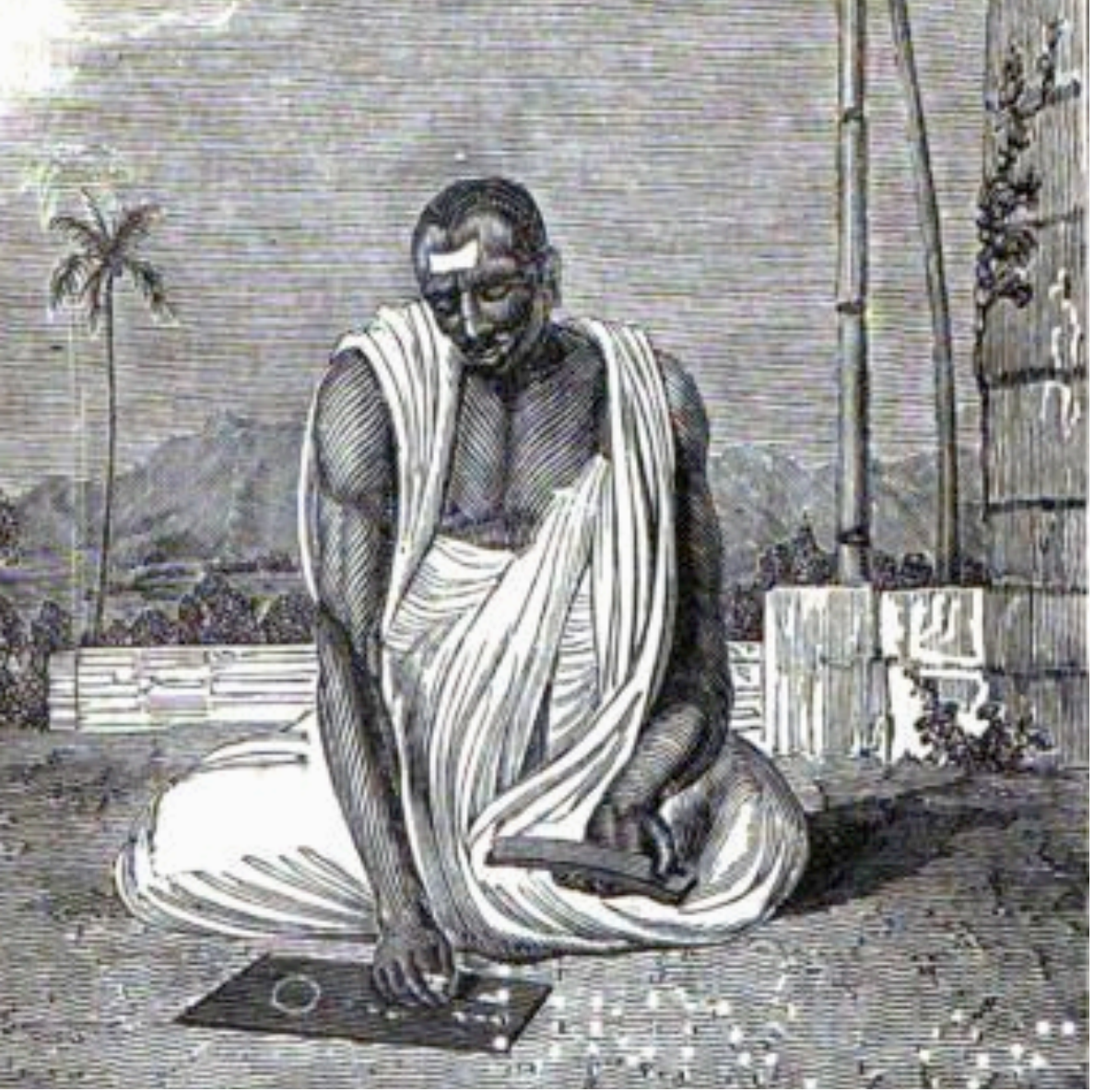


c.300 BC

Euclid introduces the foundations of classical geometry.

c.200 BC

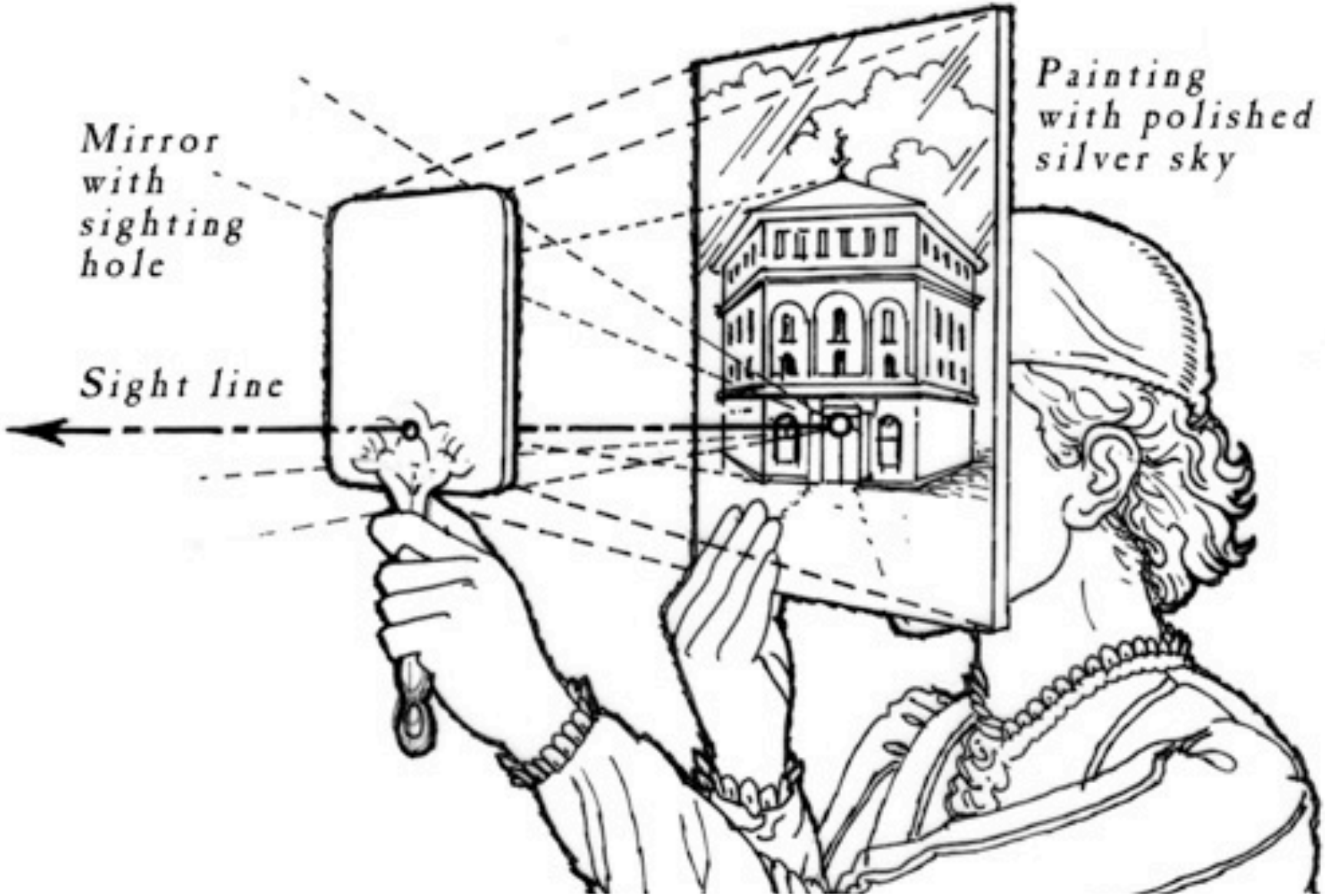
Eratosthenes measures the earth's circumference using trigonometry and experiential observation.



0

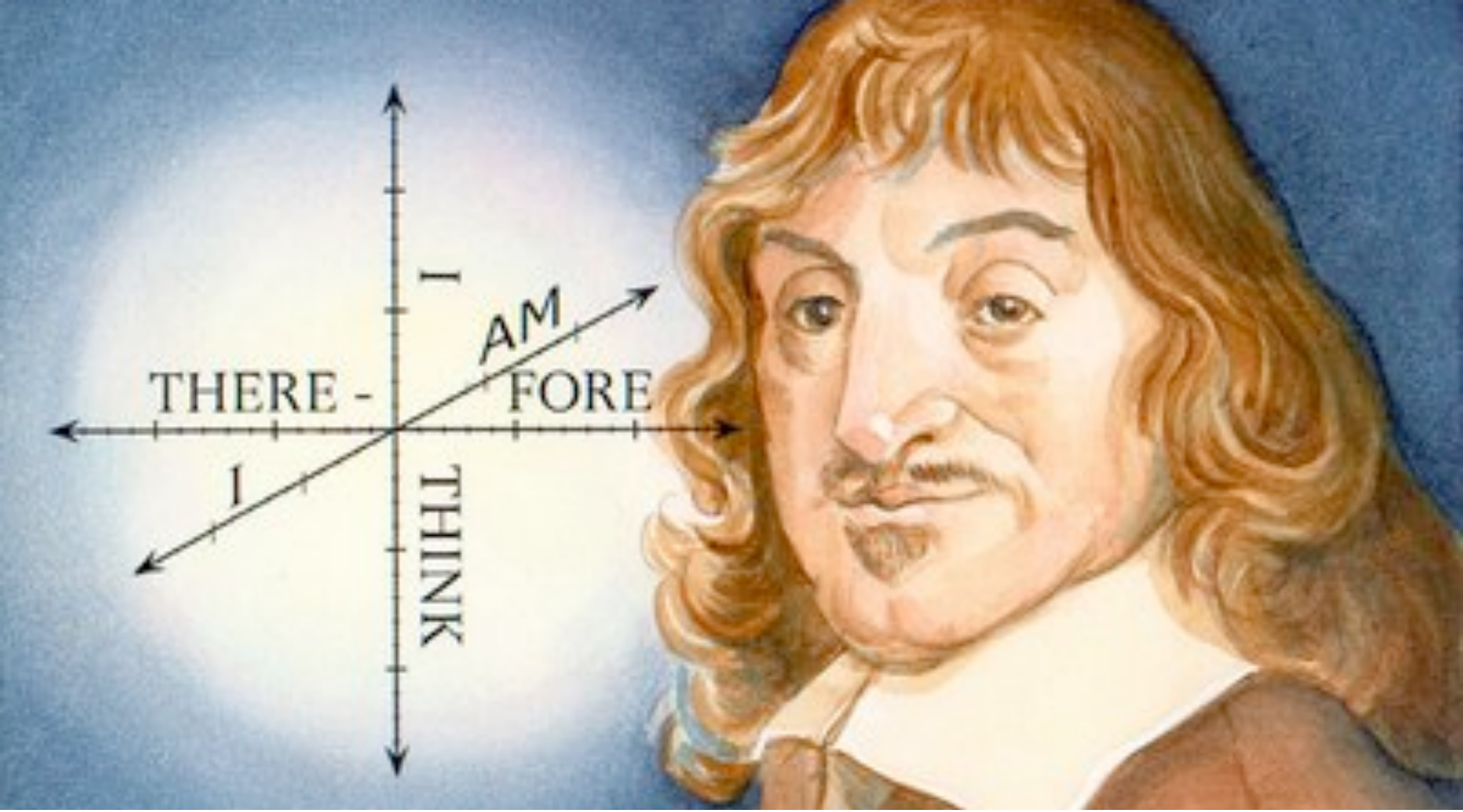
c.625

Brahmagupta uses zero as a number for the first time. (Finally, computers can begin counting!)



1413

Filippo Brunelleschi demonstrates a method of geometric perspective drawing.

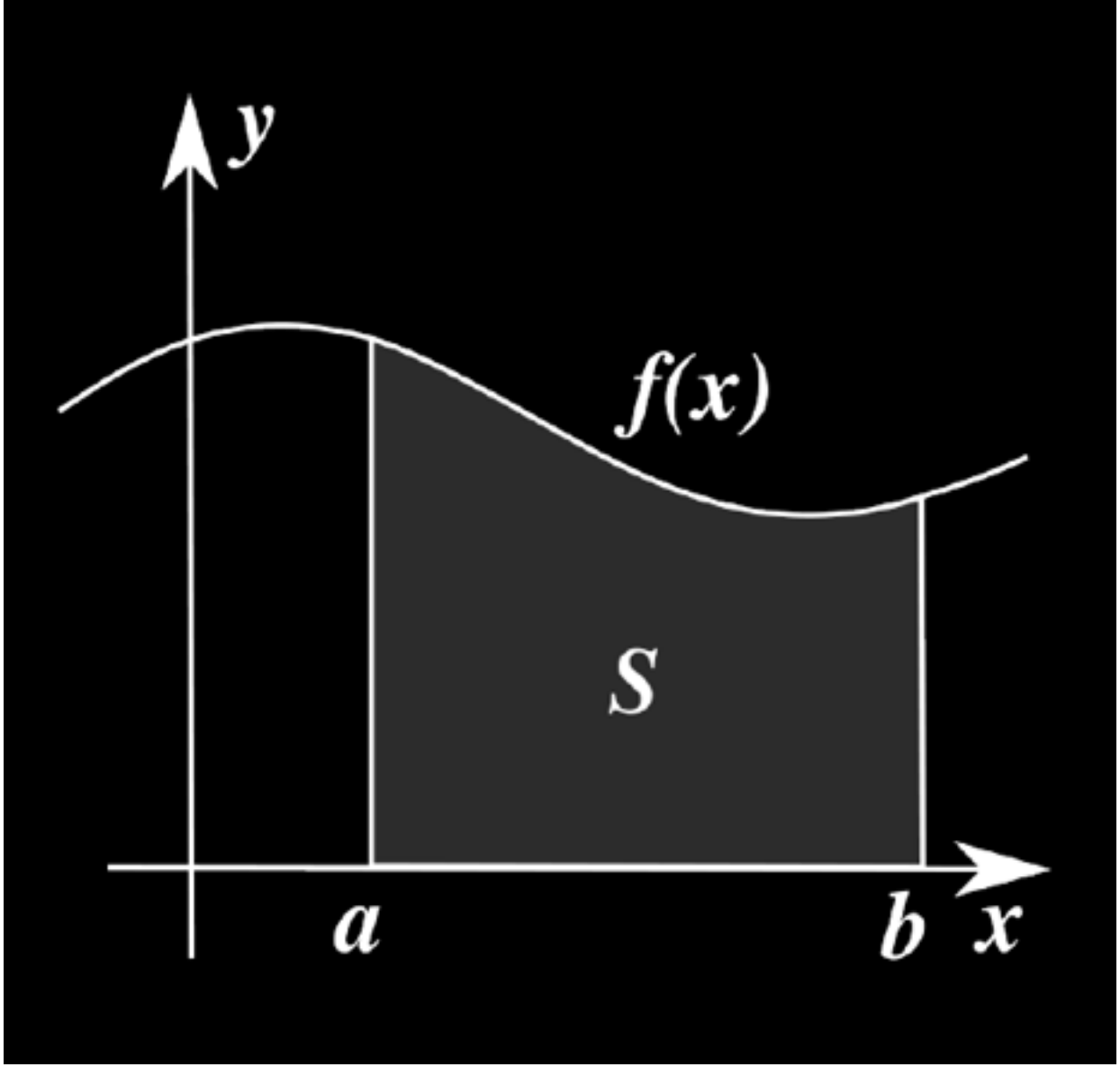


c.1600

René Descartes develops analytic geometry and the foundation of Cartesian Coordinates.

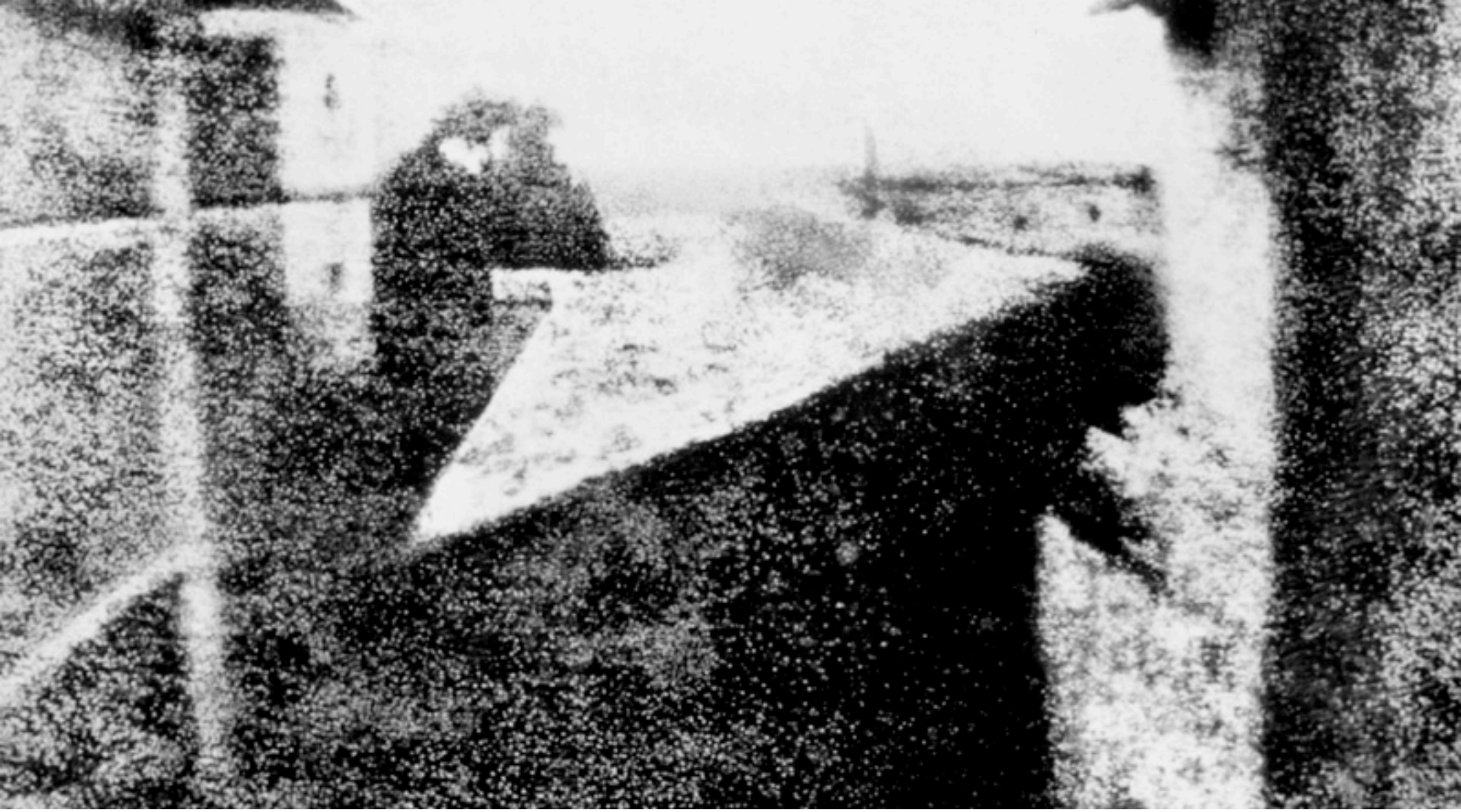
1609

Galileo Galilei demonstrates his telescope and validates the heliocentric model of the solar system.



c.1650

Leibniz and Newton simultaneously invent calculus, providing a language for the description of dynamic systems and forever resolving Zeno's paradoxes.

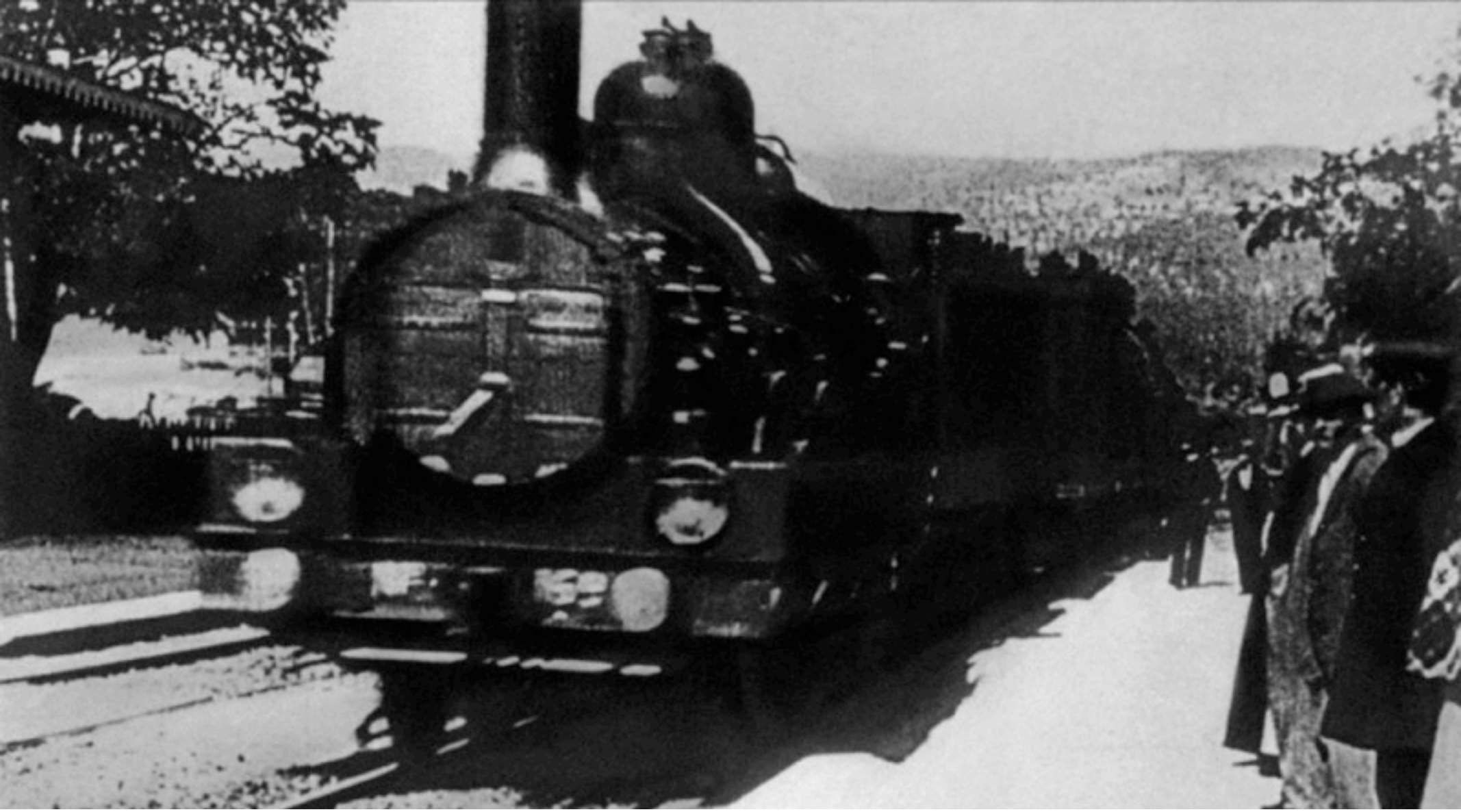


1816

Nicéphore Niépce creates the first partially successful photographic image.

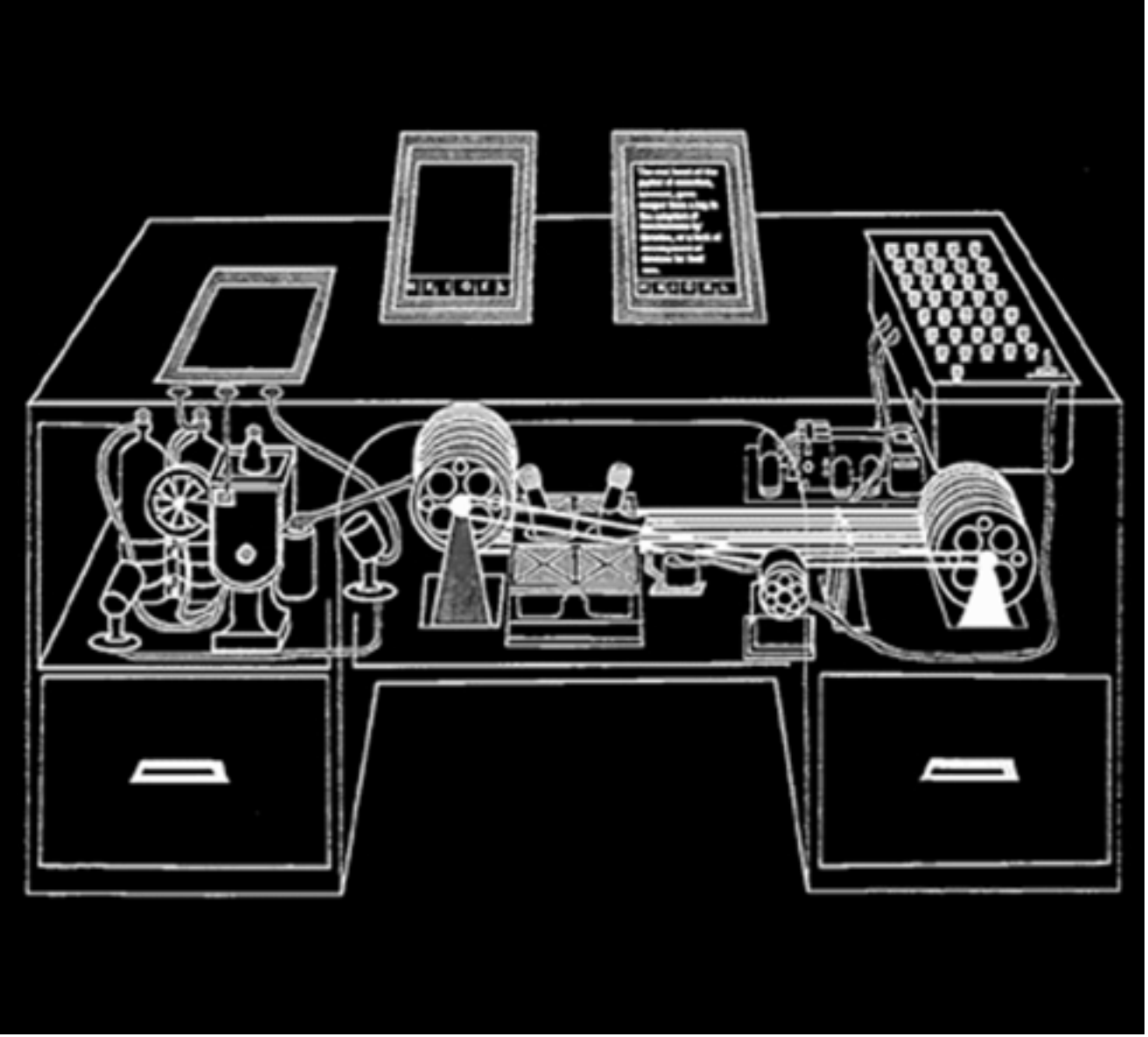
c.1880

The first motion picture cameras are invented.



1903

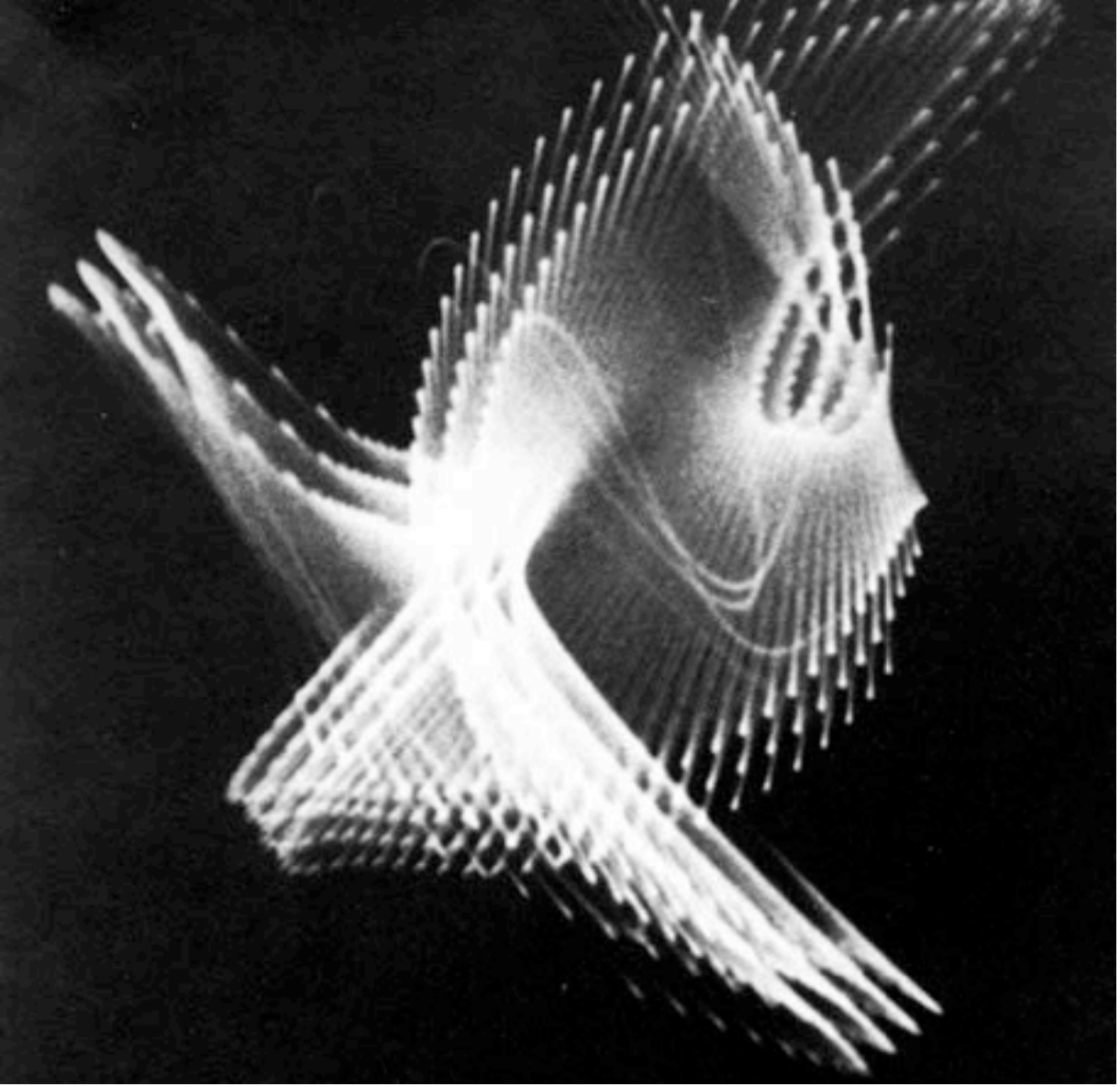
The Lumière brothers present *L'Arrivée du train*, the first stereoscopic film.

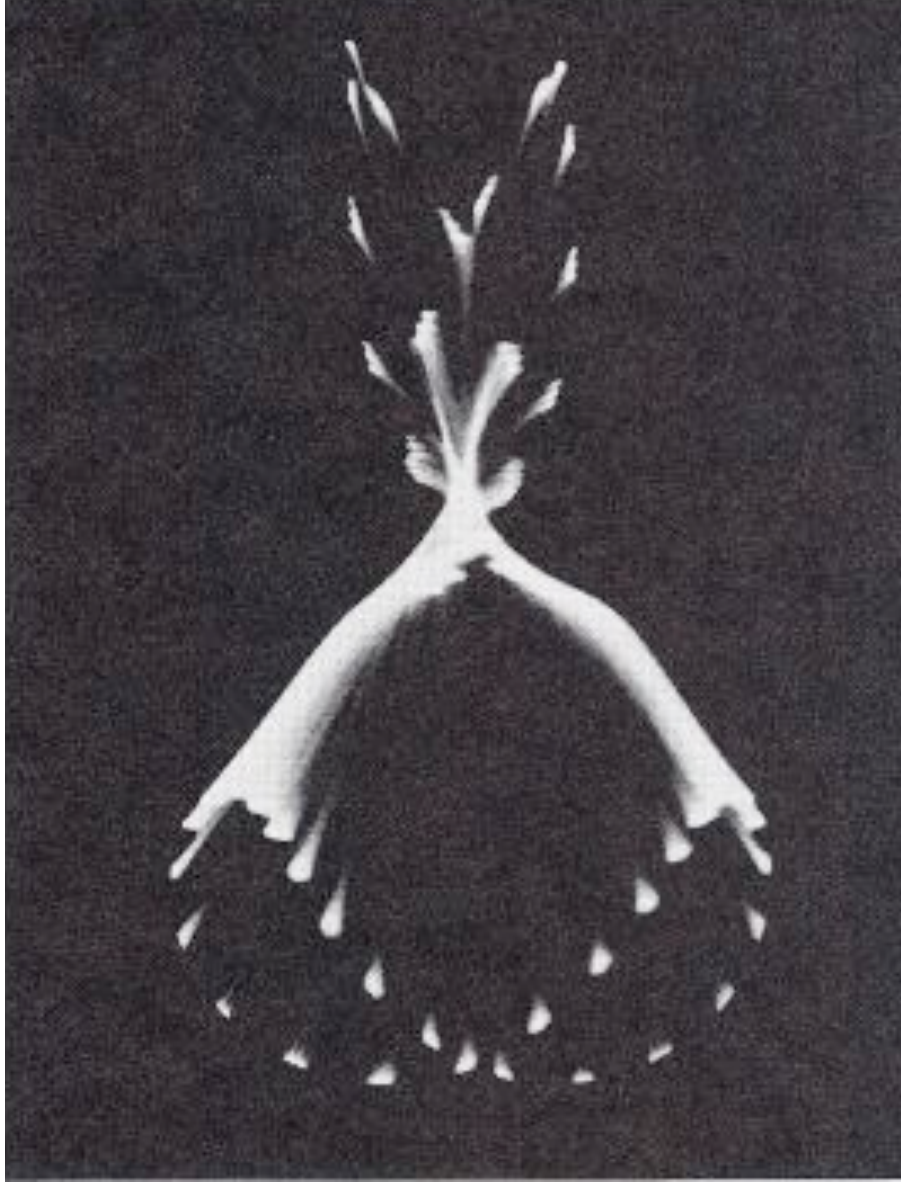


1945

Vannevar Bush publishes his essay, *As We May Think*, anticipating many of the design concepts of a modern personal computer.

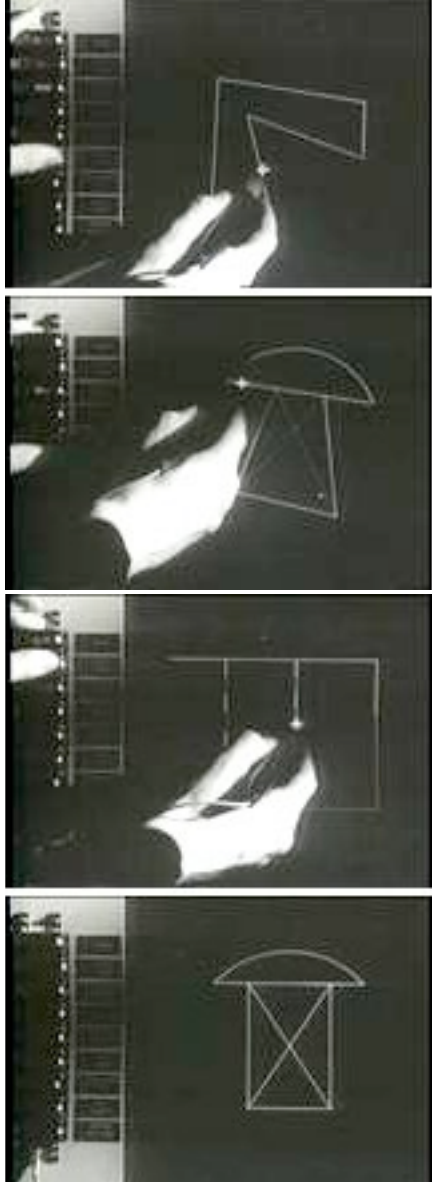
Some Key Moments in the History of Computer Graphics





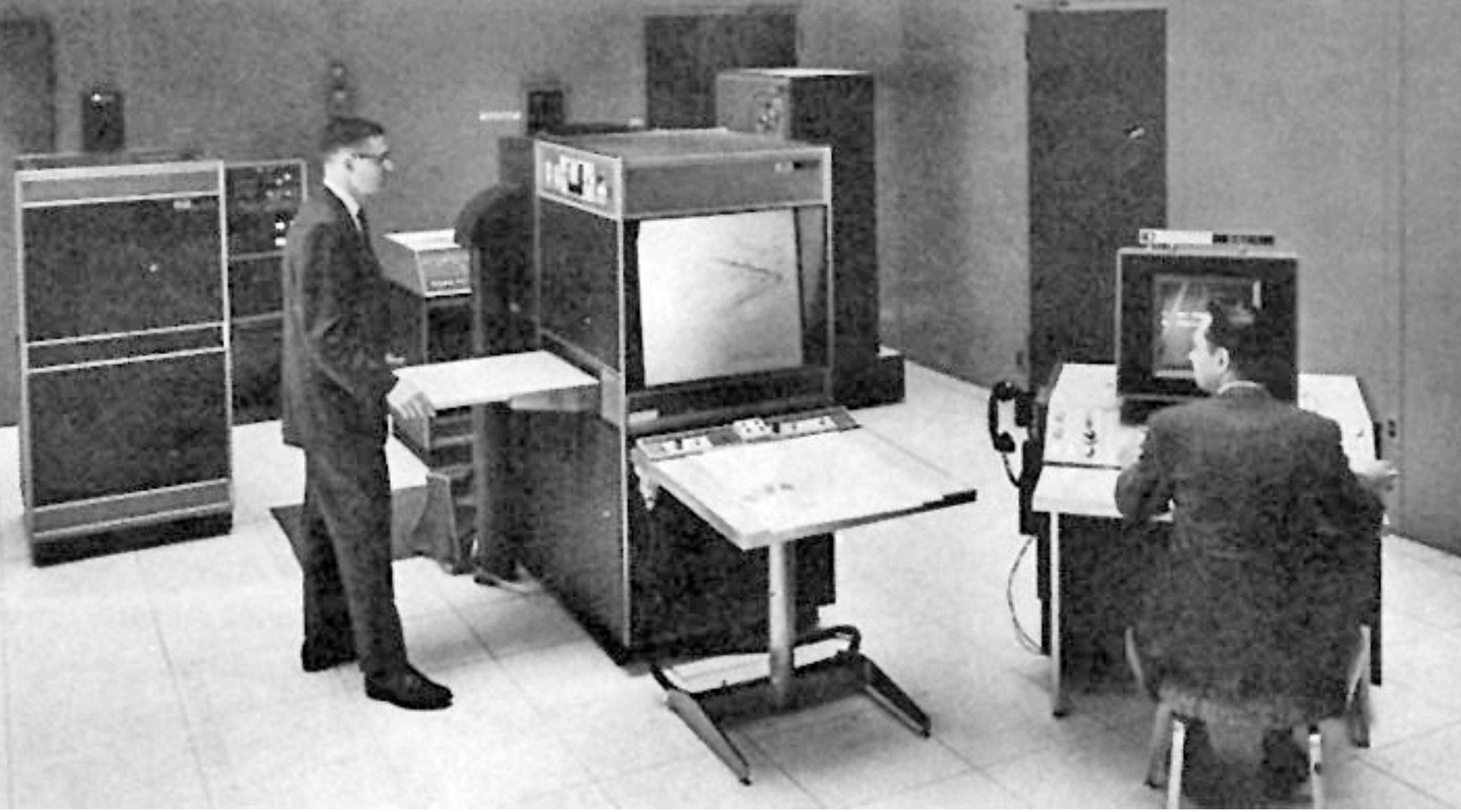
1950

Ben Laposky uses analog oscilloscope to create the first electronically generated graphics.



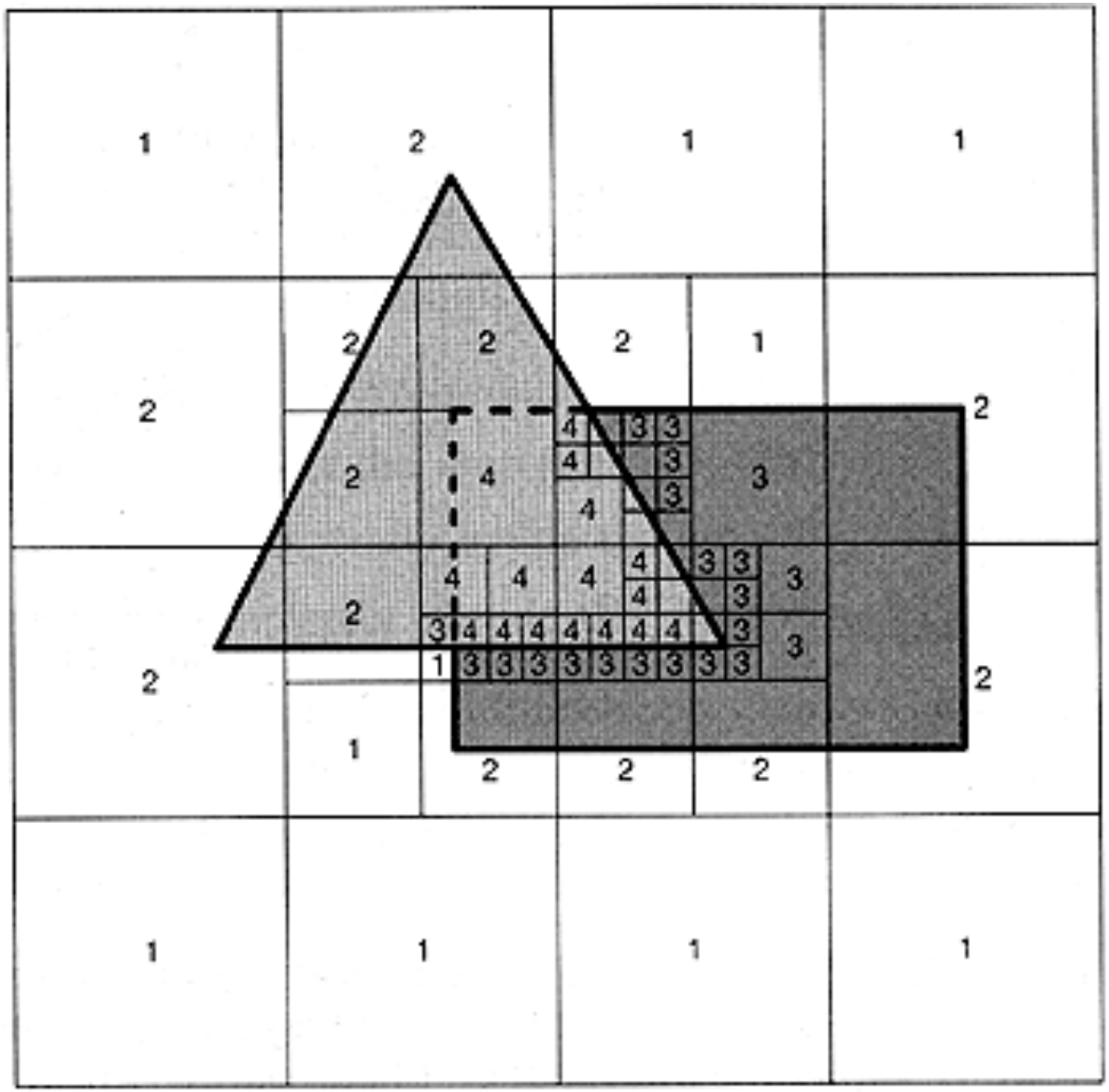
1963

Ivan Sutherland develops Sketchpad, a system for human-computer graphical interaction.



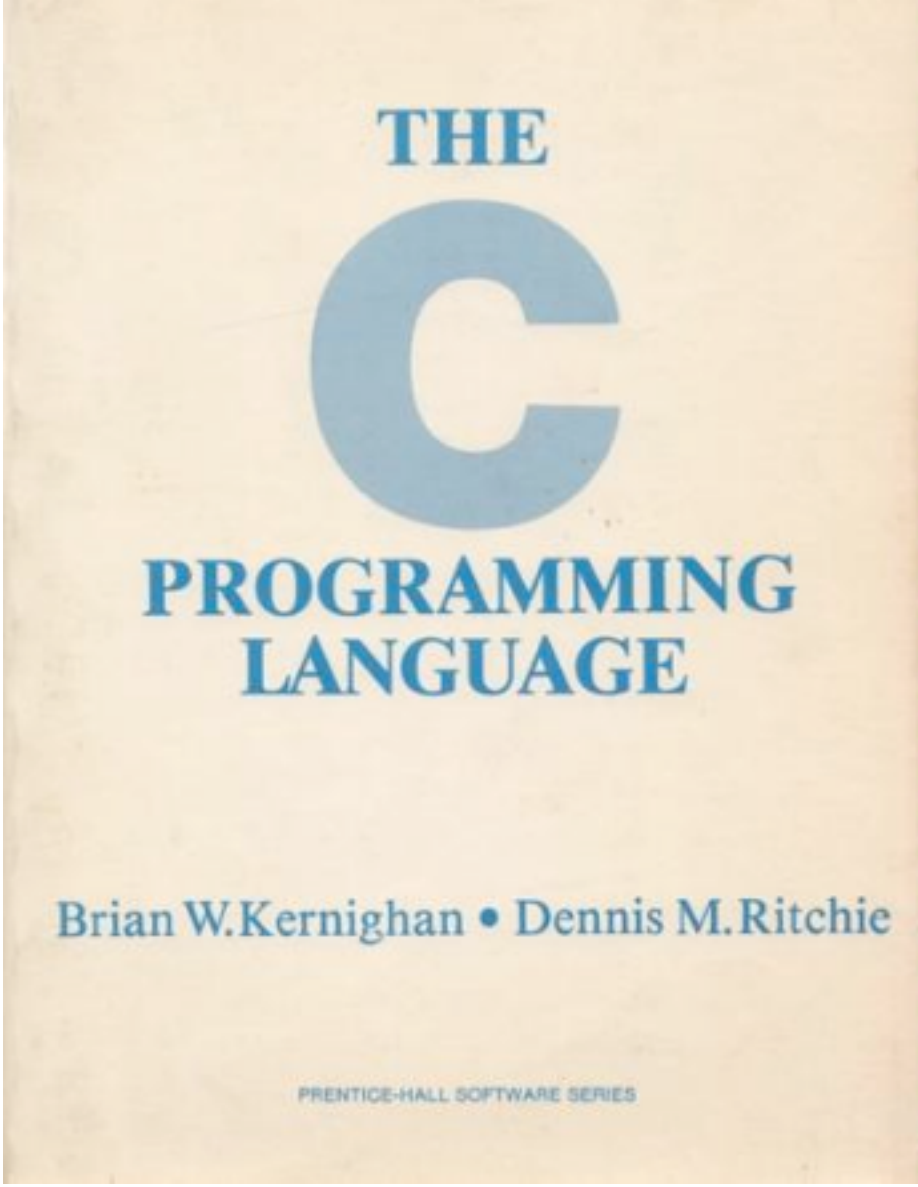
1963

GM and IBM collaborate on DAC-1, the first Computer-Aided Design program.



1969

John Warnock creates subdivision and hidden-surface algorithms, later co-founds Adobe.

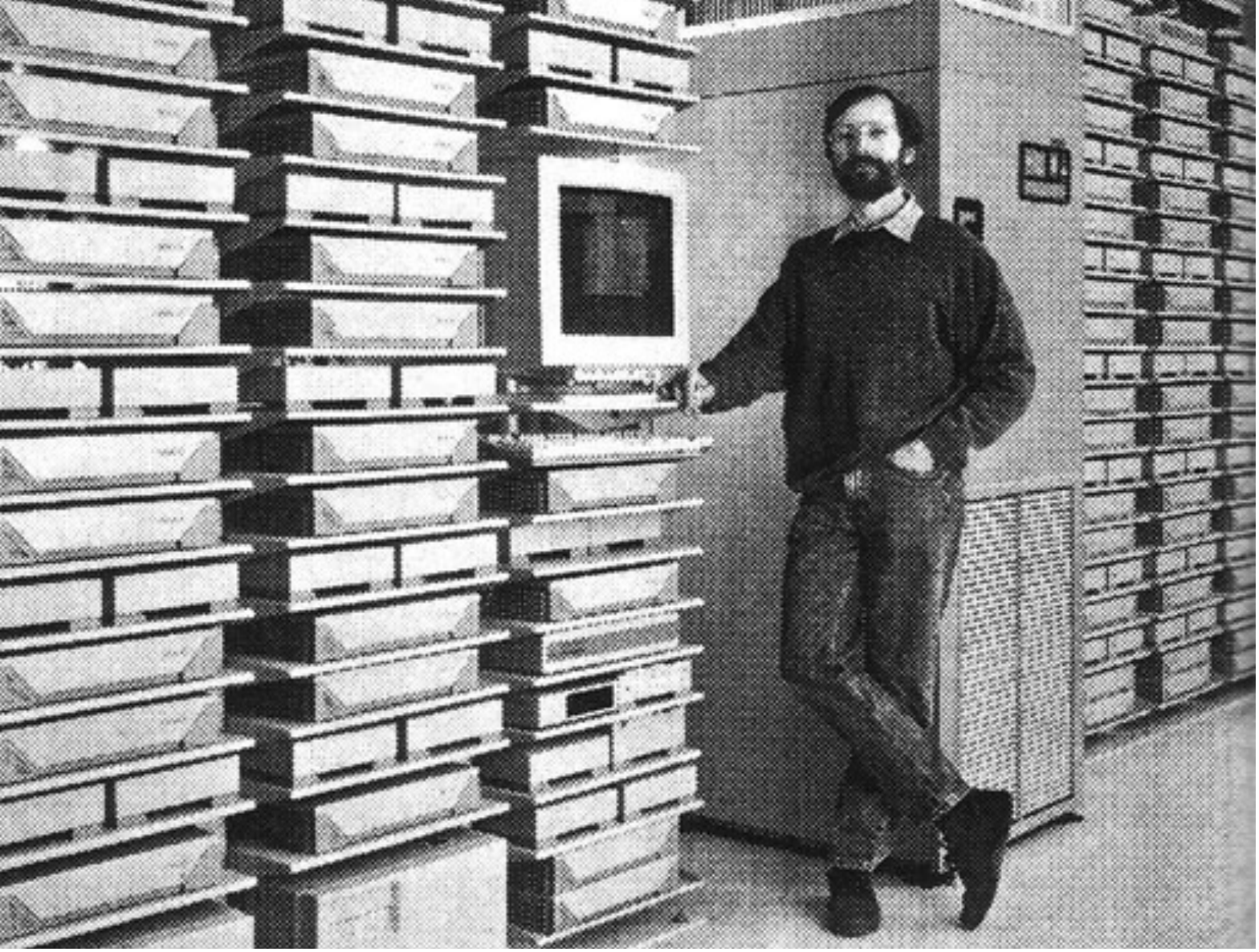


1969

Dennis Ritchie begins work on the C programming language.

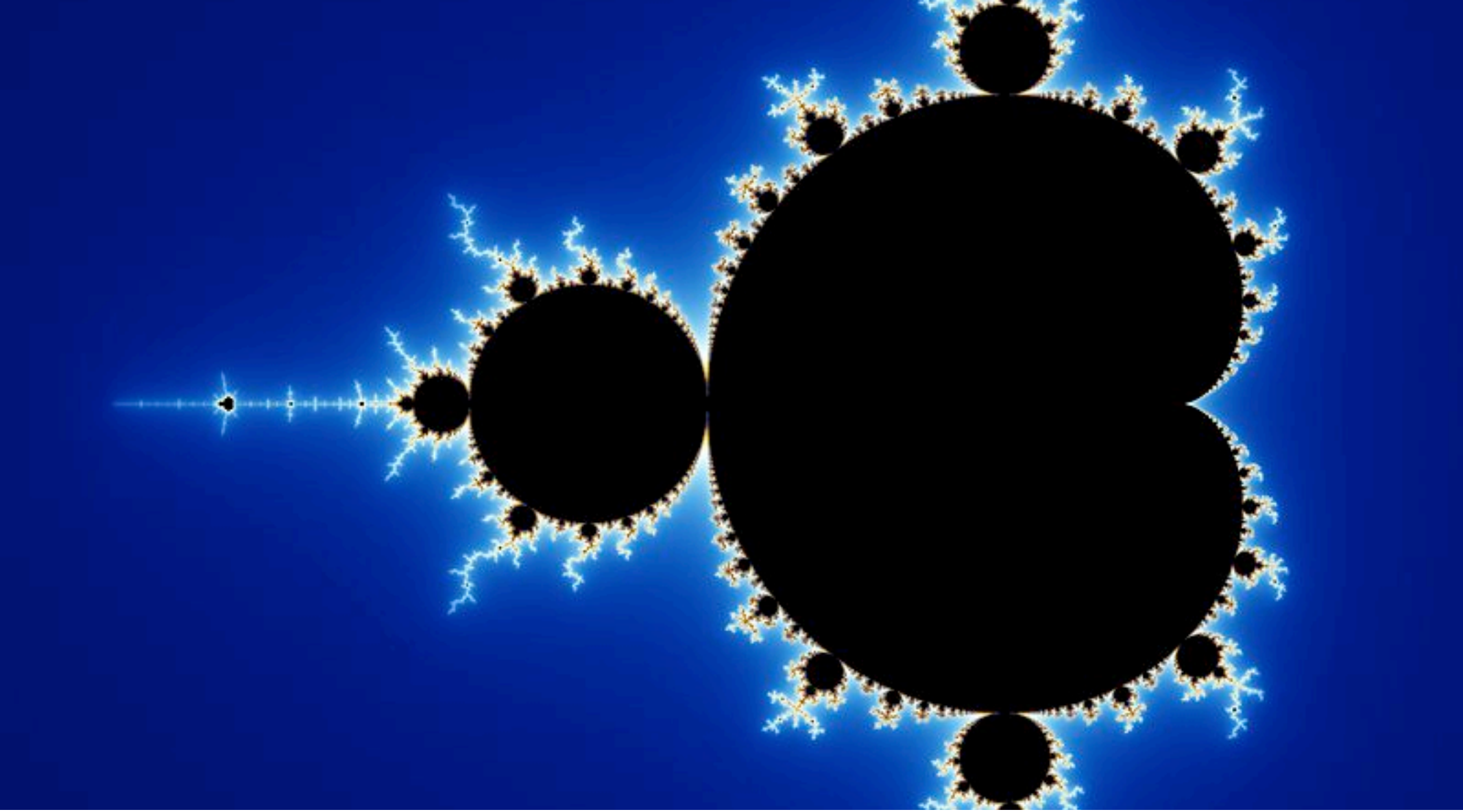
1972

Pong is released.



1974

Edwin Catmull invents texture mapping and Z-Buffer algorithm, later co-founds Pixar.

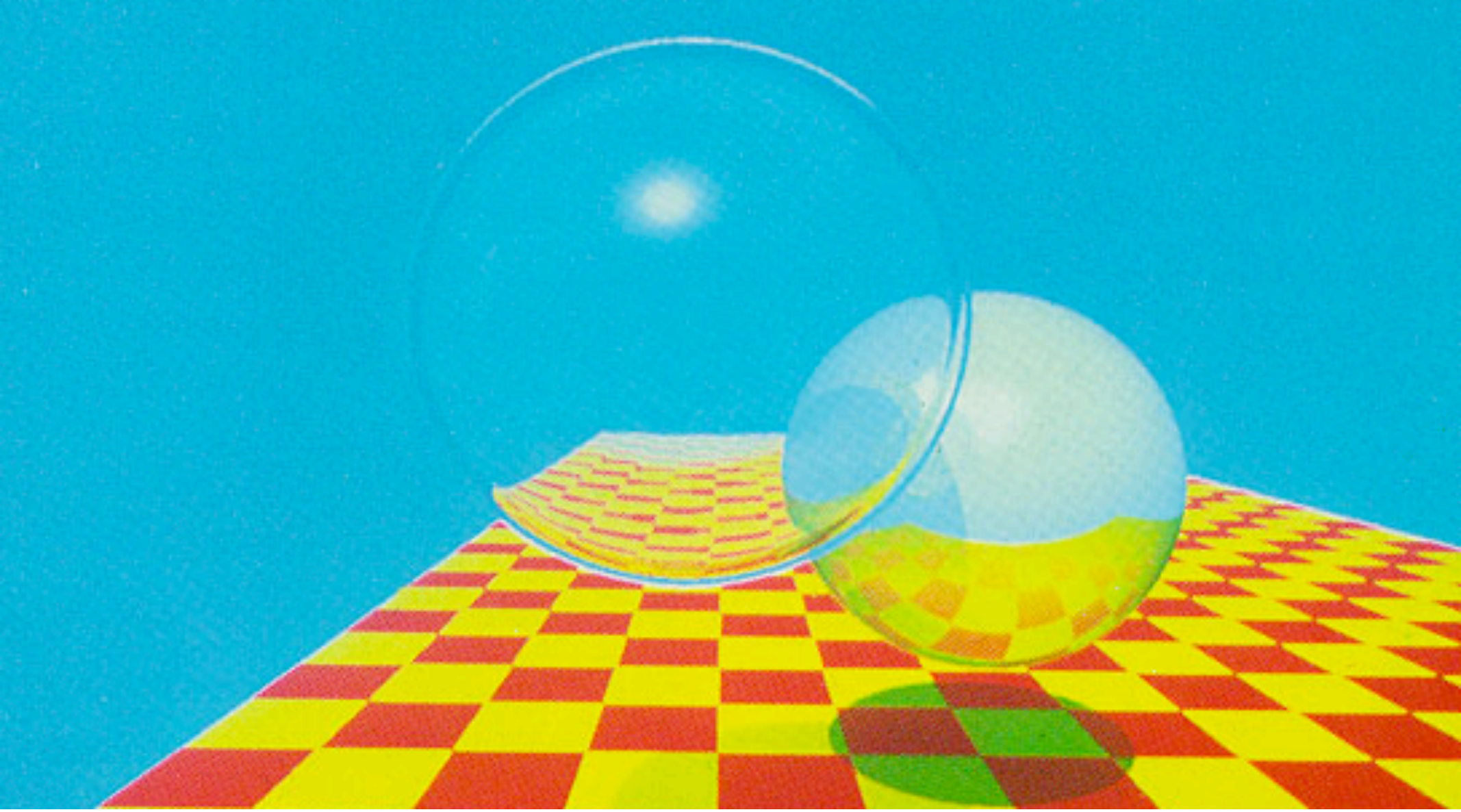


1975

Benoit Mandelbrot introduces fractal geometry.

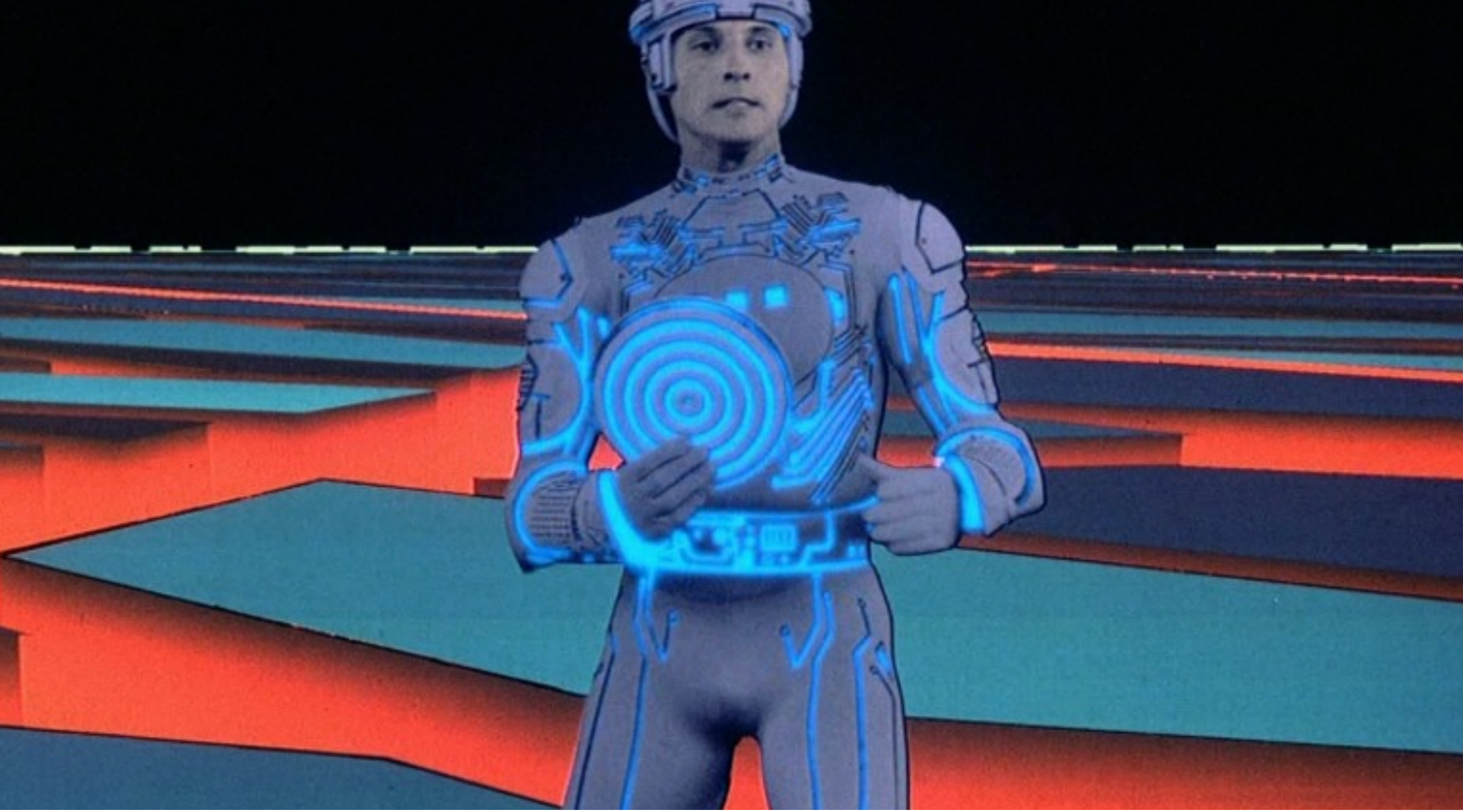
1977

Apple II, a personal computer with color graphics capability, is introduced.



1979

Raytracing algorithm introduced by Turner Whitted.

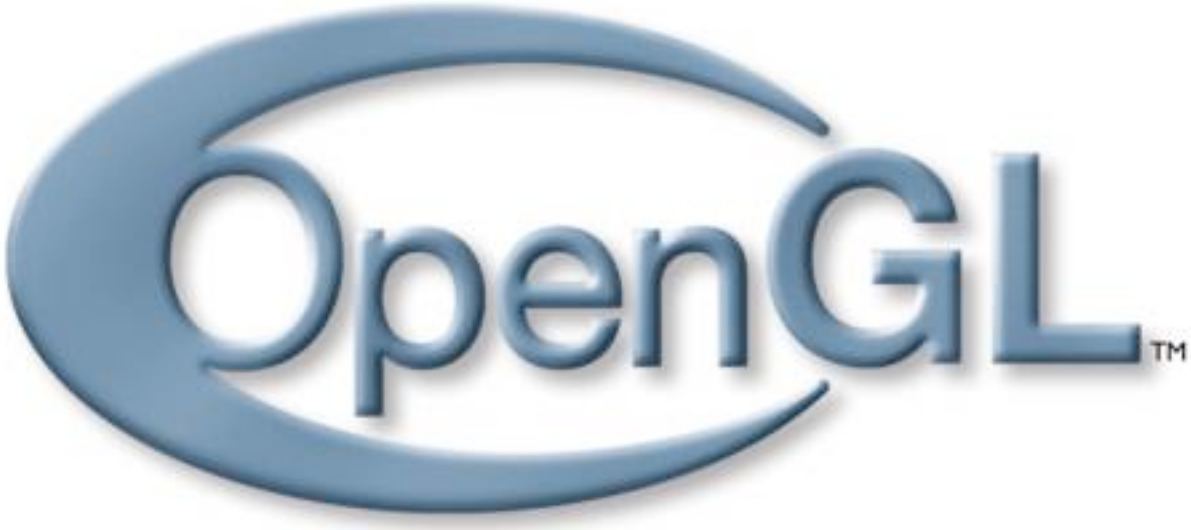


1982

Tron, the first film to make extensive use of computer graphics, is released.

1986

Pixar releases *Luxo Jr.*, the first computer-generated short film.



1992

Silicon Graphics International develops the original OpenGL specification.

1995

Pixar releases *Toy Story*, the first feature-length computer-generated film.

1996

The Dancing Baby takes off, a sign that the medium's rapid technical progress has delivered it to the domain of the culturally commonplace.