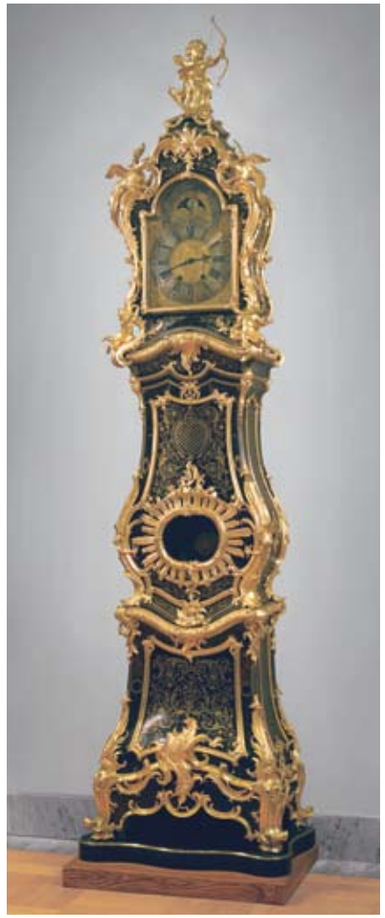
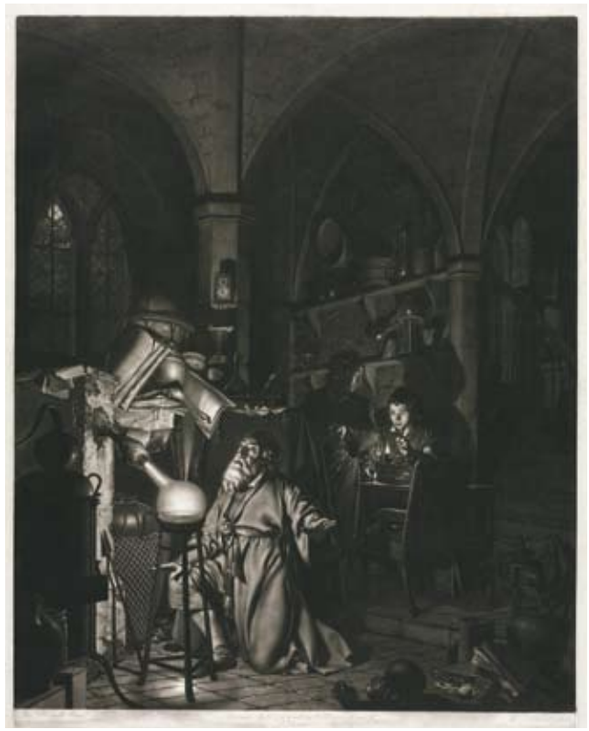
Scientific Exploration in the 1600s and 1700s

While medieval alchemy focused on transforming common materials into precious ones, like silver or gold, science focused on explaining the natural world. The move between the two was a gradual one. Unlike alchemists, scientists performed experiments and observations in a methodical, replicable manner in order to prove their hypotheses. The scientific method that arose in this period is central to science practice today.

Accurate measurements and improved tools were vital. With the invention of the pendulum clock in 1656, timekeeping became increasingly accurate. Makers of clock movements worked with furniture makers to create timepieces that were both precise and fashionable.

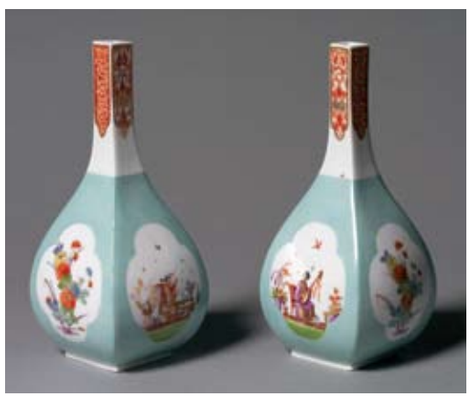
Despite the advances in science, many early discoveries were actually made by alchemists. This print at the right depicts a German alchemist discovering the element phosphorous in 1669. Another German alchemist, Johann Friedrich Böttger (1682–1719), and scientist Ehrenfried Walther von Tschirnhaus (1651–1708) discovered the process of creating true porcelain, which had been a tightly held secret in China. Through experimentation, they hit upon the exact combination of kaolin clay, quartz, and alabaster. This discovery resulted in the Meissen Factory's creation in Germany, the first porcelain manufacturers outside China. With successes born of the scientific method, former alchemists continued to adopt scientific processes. ***(CONTINUED ON BACK)***



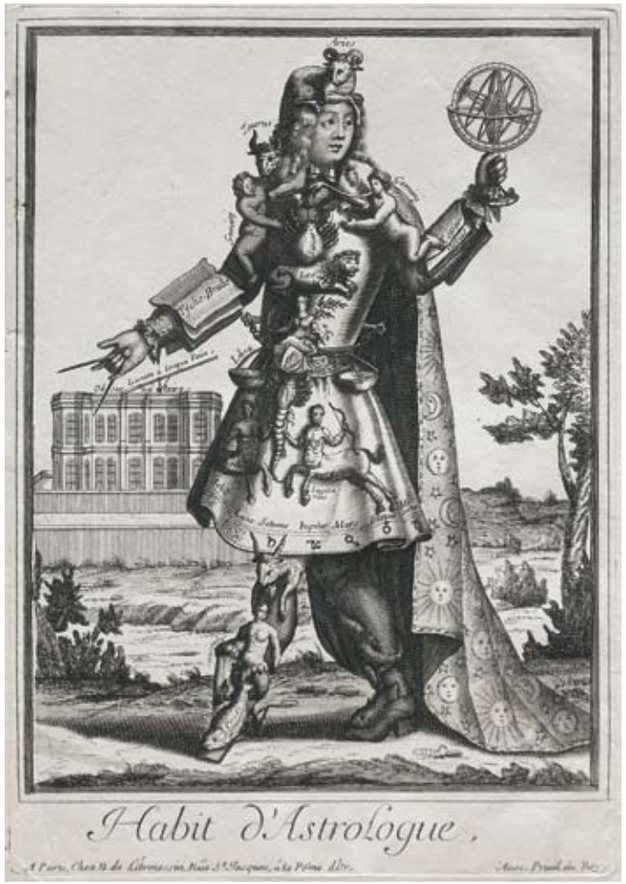


far right: William Pether (British, about 1738–1821). *The Alchemist, in Search of the Philosopher's Stone, Discovers Phosphorus, and Prays for the Successful Conclusion of his Operation, as was the Custom of the Ancient Chemical Astrologers* (after Joseph Wright of Derby), 1775. Mezzotint; 22 13/16 x 8 11/16 in. Alma and Robert D. Milne Fund 1995.2

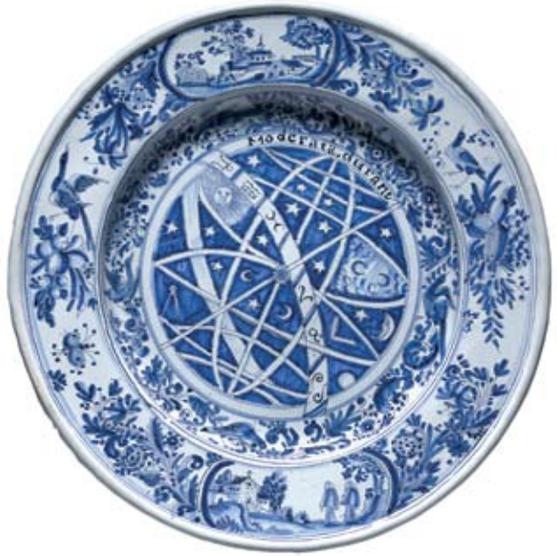
near right: Jean-Pierre Latz (French, 1691–1754); movement maker, Stollewerck. *Tall Clock* (Regulateur), 1744. Boulle marquetry with gilt bronze mounts; 103 1/16 x 27 1/2 x 16 1/2 in. John L. Severance Fund 1949.200



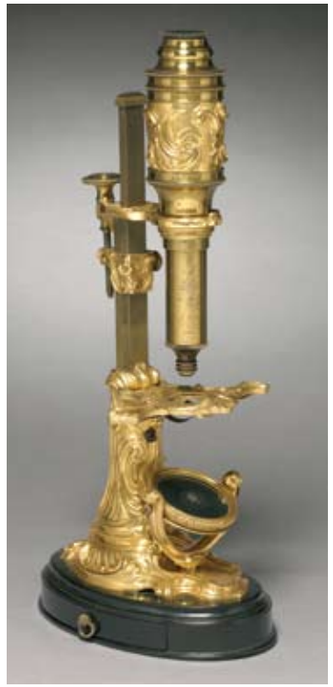
right: Meissen Factory (Germany), probably decorated by Johann Gregor Herold (German, 1696–1775). *Pair of Saki Bottles,* about 1730. Porcelain; 8 3/8 x 3 13/16 in. Bequest of Mrs. Severance A. Millikin 1989.173



above: This print, *Fanciful Costumes: Costume of the Astrologer,* by Nicolas de Larmessin II (French, 1638–1694) from about 1690, shows an astronomer holding a celestial sphere. A telescope is behind him on the roof of the observatory. (Etching and engraving; 11 1/4 x 7 3/4 in. John L. Severance Fund 2001.13)



above: This *Large Plate* by the Nevers Factory from the late 1600s in France uses an astronomical chart as a decorative motif. (Faience; diam. 17 3/8 in. The Norweb Collection 1966.221)



left: *Microscope,* mid 1700s. France. Gilt bronze mounts; 11 1/4 x 6 1/6 x 4 1/2 in. Purchase from the J. H. Wade Fund 1974.15

(CONTINUED FROM FRONT) Optical tools allowed investigation of formerly unknown worlds, from vast skies to microscopic cells. Important tools, already in use in the Islamic world by the 900s, later traveled into Europe. Roger Bacon (1214–1294) described using a telescope in 1267. His model was improved by others, most notably Galileo Galilei (1564–1642) who was famous for arguing Earth's place in the solar system.

With improved tools, scientists were able to observe unidentified phenomena. Dutch scientist Anton van Leeuwenhoek (1632–1723) developed powerful lenses used in telescopes by astronomers who created highly accurate charts for sea navigation. In 1665, Robert Hooke (1635–1703) looked through a microscope and discovered that plants were made of cells.

In the 1600s and 1700s, even non-scientists collected and used optical tools. The wealthy, great patrons of science collected tools such as telescopes and microscopes either for their novelty or to do their own research. Madame de Pompadour, mistress of Louis XV, had two telescopes and most likely a microscope. These tools would be finely decorated, such as the museum's gilt bronze *Microscope,* shown here.