

# Antoni van Leeuwenhoek

Antoni van Leeuwenhoek was born in Delft, the Netherlands, on 24 October 1632 to Margriet Jacobsdochter van den Berch and Philips Thooniszoon, both of whom were middle-class artisans. He attended grammar school in Warmond, and then temporarily moved to Benthuisen to live with relatives. Eventually Leeuwenhoek left for Amsterdam to work as a cloth merchant's apprentice. Returning to Delft, he married Barbara de Mey on 29 July 1654, and worked as a shopkeeper. The marriage resulted in five children, only one of whom, Maria, outlived Leeuwenhoek.

In 1660 Leeuwenhoek left shopkeeping and became a civil servant as usher to the aldermen in Delft. That position led him to other civil occupations that resulted in greater financial reward, such as Chief Warden of the city and Wine-gauger. Meanwhile, Leeuwenhoek's wife died in 1666 and in 1671 he married Cornelia Swalmius, the daughter of a Calvinist minister. Swalmius died in 1694 and their one child died in infancy.

In 1671 Leeuwenhoek also began his scientific career by assembling simple microscopes and magnifying glasses. He eventually became a skilled craftsman in the intricate shaping of microscope lenses. The techniques Leeuwenhoek developed for shaping glass allowed him to develop instruments that resolved images more clearly and magnified more powerfully than anything else that would be developed for nearly another century. He was secretive about his process, never divulging what allowed him such success. Some credit his achievements to his exceptional manual dexterity, patience, mathematical exactitude, and good eyes.

Leeuwenhoek did not attend a university. Despite being very intelligent and inquisitive, he was virtually unaware of other scientific research. As a result, much of his work is very independent from the theories and ideas of others, and he sometimes re-investigated topics and phenomena already studied. Leeuwenhoek did have assistance from scientific peers and friends such as Regnier de Graaf and Constantijn Huygens, but he relied heavily on translated works.

The vast superiority of Leeuwenhoek's microscopes allowed him to see things within what Robert Hooke had recently labeled as "cells" that no one else at the time could, which understandably brought some controversy to his findings. He was the first person to conclude that motile objects seen through his microscope were actually little animals. This discovery allowed him to identify and describe various microorganisms such as bacteria, protozoa, and rotifers. To quantify his findings, Leeuwenhoek developed a new scale based on common small solids as standards of measurement.

Throughout the remainder of his career, Leeuwenhoek set out to investigate sexual reproduction and the transport system of nutrients in animals and plants. Though many others had tried, he was the first to observe spermatozoa, which he identified as "animalcules." Because of his conviction that motility means life, he thought the motile animalcules were the essence needed to create life, in contrast to the motionless egg, which he thought contributed little. This gave Leeuwenhoek a form of the preformation theory.

Leeuwenhoek went on to study and describe reproduction in many plants and animals. He also made great advances in the study of plant and animal anatomy. During his lifetime he was respected by scientists and was well known to laymen, partly due to the letters he sent to the Royal Society of London in which he detailed his discoveries, and partly due to the growing role as a public intellectual that he enjoyed toward the end of his life. Leeuwenhoek passed away on 30 August 1723 in Delft.

## Sources

1. Heniger, Johannes. "Leeuwenhoek, Antoni van." *Dictionary of Scientific Biography* 8: 126-29.