Leeuwenhoek was born into a lower middle class family in the town of Delft in Holland, the son of a basket-maker. He received only a primary education and did not learn Latin, the scientific language of the time. He owned a draper's shop and was later appointed to several official positions in the city of Delft: in 1669 he was admitted as land surveyor, and in 1679 he was appointed as wine gauger. He always lived in his native town and his visit to London in 1668 was the only occasion on which he went abroad. Van Leeuwenhoek married twice, and saw one child, Maria, to grow to adulthood. She survived him and protected his legacy.

Leeuwenhoek’s fame rests solely on his microscopes and the studies he made with them. His hand-made microscopes were of the single-lens type and had a quality which was unsurpassed during his lifetime (maximum magnification: 270). He blew or ground the lenses himself, by a secret process. For each preparation he constructed a new microscope. Of the more than 500 microscopes he left at his death, only ten survive. Leeuwenhoek’s manual skill allowed him to make preparations of the highest quality and his study of these led to many discoveries.

Leeuwenhoek was introduced to Cartesian natural philosophy by Christiaan Huygens and the Delft physicians R. de Graaf, and C. ’s Gravesande. Whenever Leeuwenhoek tried to explain his observations or put them in a wider context, he used a Cartesian framework. De Graaf introduced Leeuwenhoek to the Royal Society in London, where his observations aroused great interest. Leeuwenhoek wrote up the results of his researches in more than 350 letters, of which the greater part was sent to the Royal Society in London, which elected him as Fellow in 1680. A substantial number of the letters was published in English translation in the Society’s Philosophical Transactions, but there were also contemporary editions of a part of his work in Dutch and in a Latin translation.

Leeuwenhoek’s most important discoveries were spermatozoa (of humans and all kinds of animals), red blood cells, and many kinds of what we now call micro-organisms. But his interests covered practically all aspects and forms of inanimate and animate nature. Thus, scattered in his letters are comparative descriptions of the cellular structure of different kinds of wood, the shape of crystals from salts
obtained by burning to ashes various kinds of plants, bacteria in
dental plaque, striated muscle cells, and so on. The discovery that
satisfied him most was the factual demonstration of the circulation of
the blood in the tail fin of a living young eel in 1688.

The encyclopedic nature of his work might hide the fact that
notwithstanding his lack of scientific training Leeuwenhoek was con­
cerned with a few general problems: the (microscopical) structure of
organisms and the operating mechanisms of reproduction and
growth. His starting point was the concept of uniformity in Nature
and his explanations were based upon the Cartesian concept of mat­
ter. Leeuwenhoek therefore constructed a theory that all matter con­
sisted of ‘globules’. His enduring opposition to the idea of spontane­
ous generation for example was based on the conviction that the
Creator had created the world in a uniform and perfect manner and
was supported by the discovery of many very small organisms that
normally escaped the eye but nevertheless appeared to possess a per­
fection equal to that of higher animals and plants.

Leeuwenhoek supported the preformation theory of generation,
especially the animalculist version. The spermatozoa themselves were
in fact preformed organisms, while the female reproductive organs
only served to nourish them to maturity. Contrary to some
contemporary microscopists Leeuwenhoek never claimed to have
seen a miniature organism in the head of a spermatozoon. In his
studies of the growth and nourishment of plants he made elaborate
studies of sap transport and compared it to the circulation of blood in
animals.

After the decline and fall of scientific microscopy at the end of the
seventeenth century, Leeuwenhoek was the only one who continued
this type of study, pursuing it until his final days. Despite the admira­
tion aroused by Leeuwenhoek’s often spectacular observations, his
influence on the development of scientific ideas and concepts was
scant. This was due in part to Leeuwenhoek’s secretiveness, so that
his observations could only be repeated by others with great dif­
culty. The lack of adequate concepts for microscopical structures
such as cells and their parts was another reason for the eclipse of his
work in the eighteenth century.

Leeuwenhoek died in Delft in 1723, a celebrity who had attracted
many scientists, politicians and royalty to the city.
Primary works


Secondary sources


*DMB*, 1162-1165; J. Heniger, in: *DSB*, vol. 8, 126-130; E. Mortreux, in: *NNBW*, vol. 6, 922-926.

[L.C.P.]