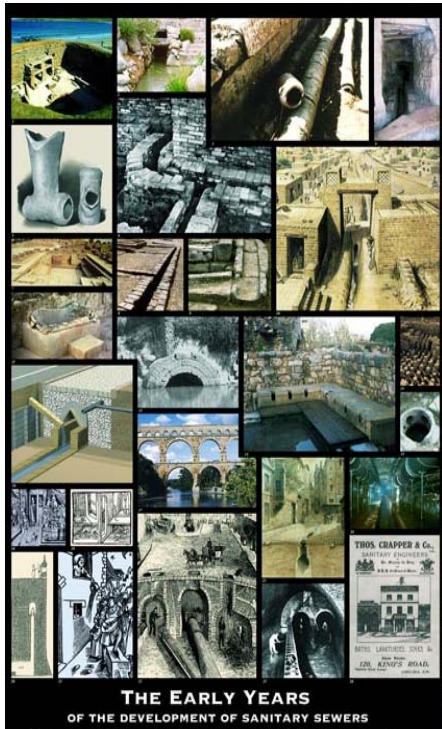


# The History of Wastewater Treatment



Wastewater treatment and collection has followed paths of both historic and scientific discoveries. From a historic perspective, as communities have grown, so has the need for quality water. The need to supply safe water, remove wastes from water, and to protect public health, have been the endeavors and concern of many generations. Scientifically, as public health issues and the understanding of what causes outbreaks of disease such as cholera and dysentery have been discovered, the building of infrastructure and development of processes that can be used to end these issues has followed.

## 80 A.D.

Roman Statesman Frontinus, in his treatise on the "Water Supply of Rome" quotes a Roman Ordinance:

*"I desire that nobody shall conduct away any excess of water without having received my permission or that of my representative; for it is necessary that a part of the supply flowing from the delivery tanks shall be utilized not only for cleaning our city, but also for flushing the sewers."*



Homes at this time were not connected to a collection system that removed wastewater from individual households, but instead the streets themselves were the collection point for waste materials that were washed out to open sewers.

## 1600's



In 1684, Dutch scientist, Antony van Leeuwenhoek, published sketches of common forms of bacteria that he observed under his simple microscope.

## 1800's

The development of sewers began in London, introducing the solution to public health problems created by unsanitary conditions.

## 1842

The sewerage system of Hamburg Germany was laid out by the English engineer Lindley.

## 1850s

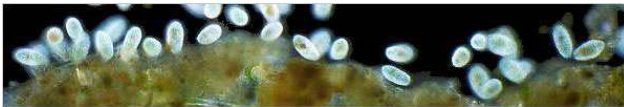
Engineer Chesborough designed the first comprehensive sewage system in Chicago.

A London typhoid epidemic is believed to have been caused by bad water.

An 1855 cholera outbreak in London was found to be caused by sewage contamination of a pump well, known as the Broad Street Pump Affair.



The discovery of bacteria and the cause of many “water-borne” diseases such as typhoid fever, cholera, and dysentery led to great strides in public sanitation efforts. Wastewater treatment today with its various types of treatment processes, utilize microorganisms to convert the organic substances in the sewage into harmless materials.



The ciliate Coleps feeding on decaying organic matter. x100.

Below, courtesy of [www.micrographia.com](http://www.micrographia.com) are some close up pictures of wastewater microorganisms.



Peranema. This flagellate is common in waters rich in organic nutrients

Wastewater treatment duplicates the naturally occurring activities of soil and water microorganisms, concentrating these organisms that use the organics in the sewage as its food source. The resulting treated water is then returned to the river or water body for use by downstream communities.



A bdelloid rotifer browses in a mass of decaying vegetation.



Ciliate: Vorticella feeding.



Curved filaments of the sulphur bacterium Beggiatoa.

A microscene with various Protozoa. x100.

