

# HISTORY OF DRINKING WATER

United States  
Environmental Protection  
Agency

Office of Water  
(4606)

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## EPA The History of Drinking Water Treatment

This fact sheet is based on information from the EPA report "25 Years of the Safe Drinking Water Act: History and Trends." Please refer to the full report for details and references. You may order a copy of the report, as well as many other EPA drinking water documents, by calling the Safe Drinking Water Hotline at (800) 426-4791, or you may review the report online at <http://www.epa.gov/safewater/sdwa25/sdwa.html>

Ancient civilizations established themselves around water sources. While the importance of ample water *quantity* for drinking and other purposes was apparent to our ancestors, an understanding of drinking water *quality* was not well known or documented. Although historical records have long mentioned aesthetic problems (an unpleasant appearance, taste or smell) with regard to drinking water, it took thousands of years for people to recognize that their senses alone were not accurate judges of water quality.

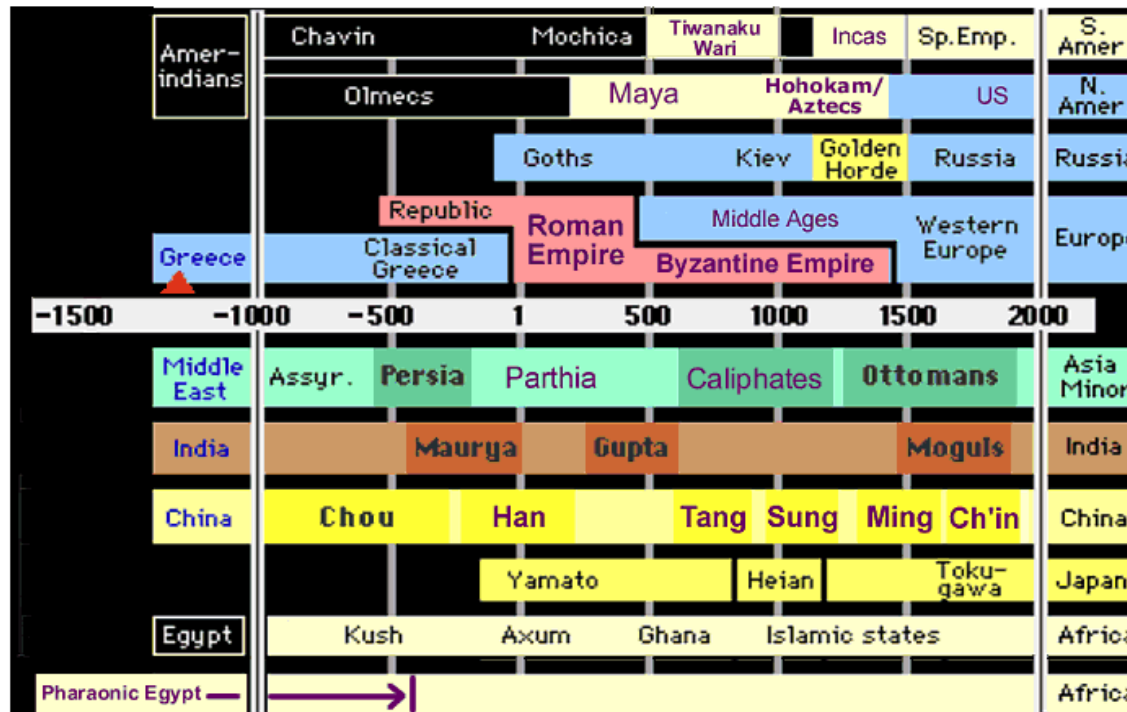
Water treatment originally focused on improving the aesthetic qualities of drinking water. Methods to improve the taste and odor of drinking water were recorded as early as 4000 B.C. Ancient

Sanskrit and Greek writings recommended water treatment methods such as filtering through charcoal, exposing to sunlight, boiling, and straining. Visible cloudiness (later termed turbidity) was the driving force behind the earliest water treatments, as many source waters contained particles that had an objectionable taste and appearance. To clarify water, the Egyptians reportedly used the chemical alum as early as 1500 B.C. to cause suspended particles to settle out of water. During the 1700s, filtration was established as an effective means of removing particles from water, although the degree of clarity achieved was not measurable at that time. By the early 1800s, slow sand filtration was beginning to be used regularly in Europe.



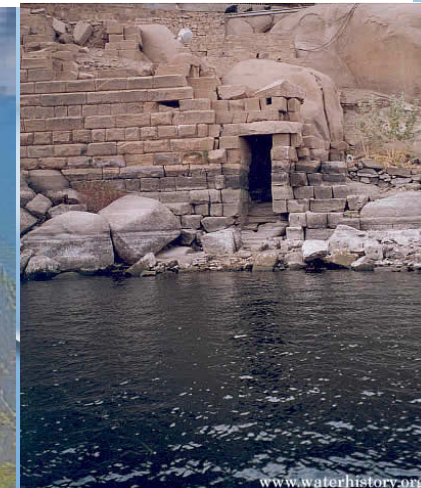
Civilizations have always formed around water supplies.

During the mid to late 1800s, scientists gained a greater understanding of the sources and effects of drinking water contaminants, especially those that were not visible to the naked eye. In 1855, epidemiologist Dr. John Snow proved that cholera was a waterborne disease by linking an outbreak of illness in London to a public well that was contaminated by sewage. In the late 1880s, Louis Pasteur demonstrated the "germ theory" of disease, which explained how microscopic organisms (microbes) could transmit disease through media like water.



Historic Eras with Active Links:

- [Byzantine Empire](#)
- [Caliphates](#)
- [Han, Tang, Sung, Ming, Ch'in](#)
- [Hohokam/Aztec](#)
- [Incas](#)
- [Maya](#)
- [Middle Ages](#)
- [Parthia](#)
- [Pharaonic Egypt](#)
- [Roman Empire](#)
- [US](#)
- [Tiwanaku & Wari](#)
- [Western Europe](#)

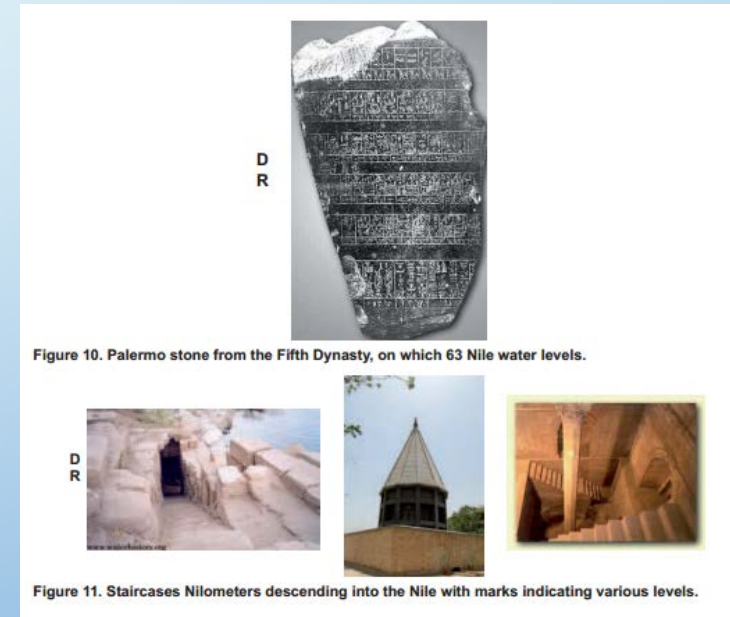






# EGYPT

- PRIMARY SOURCE OF WATER- NILE RIVER- MADE THEM SICK
- MORINGA SEEDS-WHEN YOU CRUSH THE SEEDS AND ADD THEM TO WATER, A PROTEIN FROM THE SEED WILL KILL SOME OF THE MICROBIAL ORGANISMS AND CAUSE THEM TO CLUMP TOGETHER AND SETTLE TO THE BOTTOM OF THE CONTAINER.
- OTHER METHODS
  - BOILING
  - FILTERING WITH GRAVEL AND SAND
  - A “GOMEDAKA” STONE
  - **ALUM**

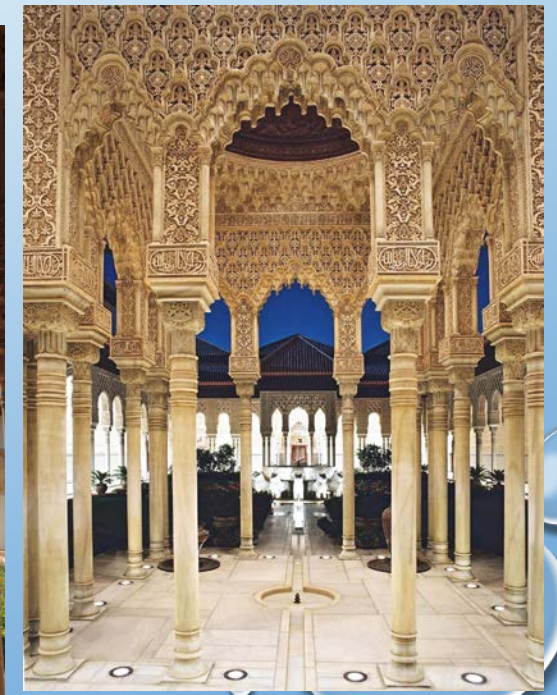
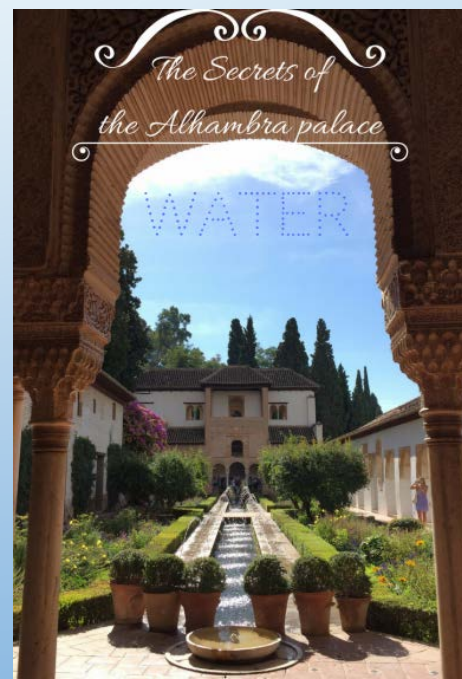
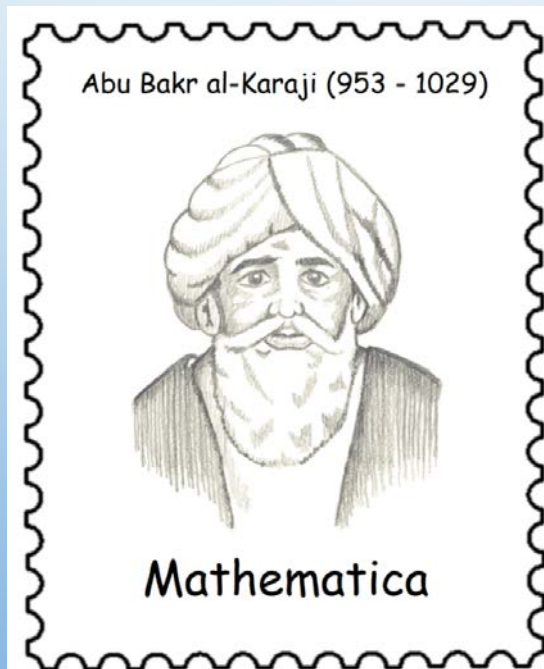


*The Quest for Pure Water: The History of Water Purification from the Earliest Records to the Twentieth Century, authors M.N. Baker and Michael Taras*



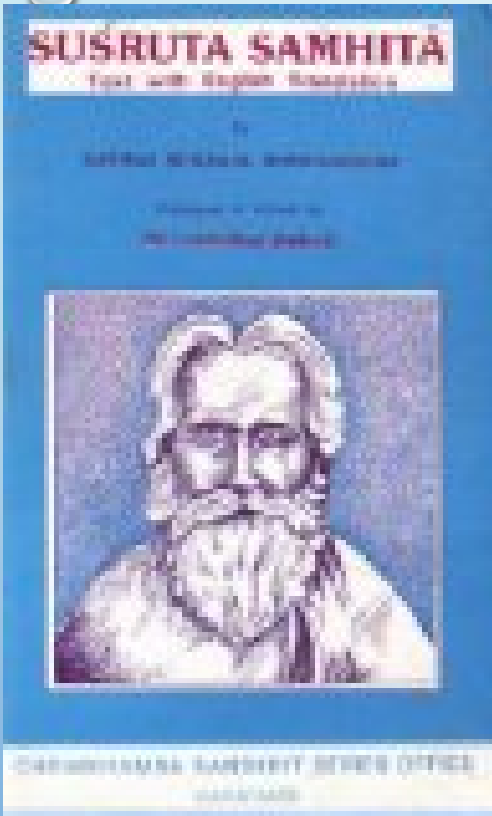
# ALHAMBRA PALACE

- LOCATED IN GRANADA, SPAIN
- THE ALHAMBRA WAS BUILT IN THE 13TH AND 14TH CENTURIES BY THE NASRID KINGS
- ACEQUIA REAL- MAIN WATER CHANNEL FROM DARRO RIVER
- FOUNTAINS STILL WORK TODAY
- KARAJI, MOHAMMED IBN AL-HASAN AL-HASIB (EARLY 10TH CENTURY

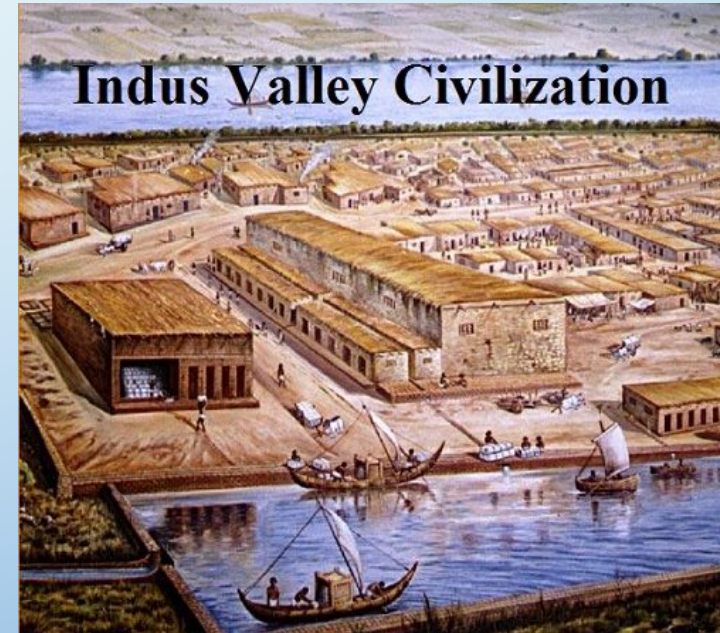




Sanskrit medical writings known as the *Sus'ruta Samhita*, which dates back to about 2,000 B.C., and these methods include the boiling of water over fire, heating of water under the sun, dipping of heated iron into water, filtration through gravel and sand



Certain metals disrupt bacteria cycles, including copper. In ancient India, brass, an alloy of copper and zinc and sometimes with other metals, was used to store water.

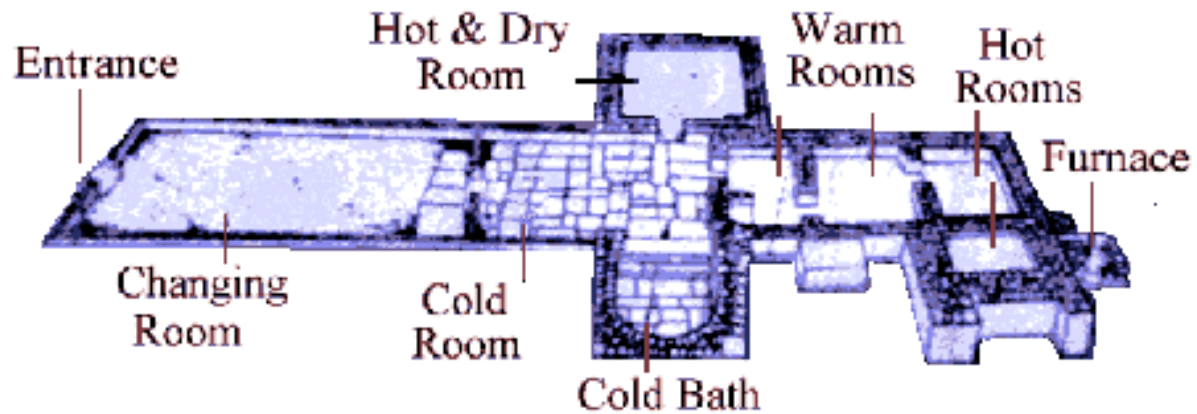


Clearing nut (*Strychnos potatorum* = Thetraang Kottai in Tamil)





# ROMAN BATH

- PROVIDED BY AQUEDUCTS
- ROMAN/GREEK PURIFYING METHODS
  - HIPPOCRATES SLEEVE – STRAIN BOILED RAIN WATER
  - MACERATED LAURELS - DIOPHANES
  - IMMERSE BAG OF POUNDED BARLEY AND BRUISED CORAL – PAXAMUS
  - WICK SIPHONS- GERBER (ARABIAN)



Smarter Filtration Solutions



**Gopani™**

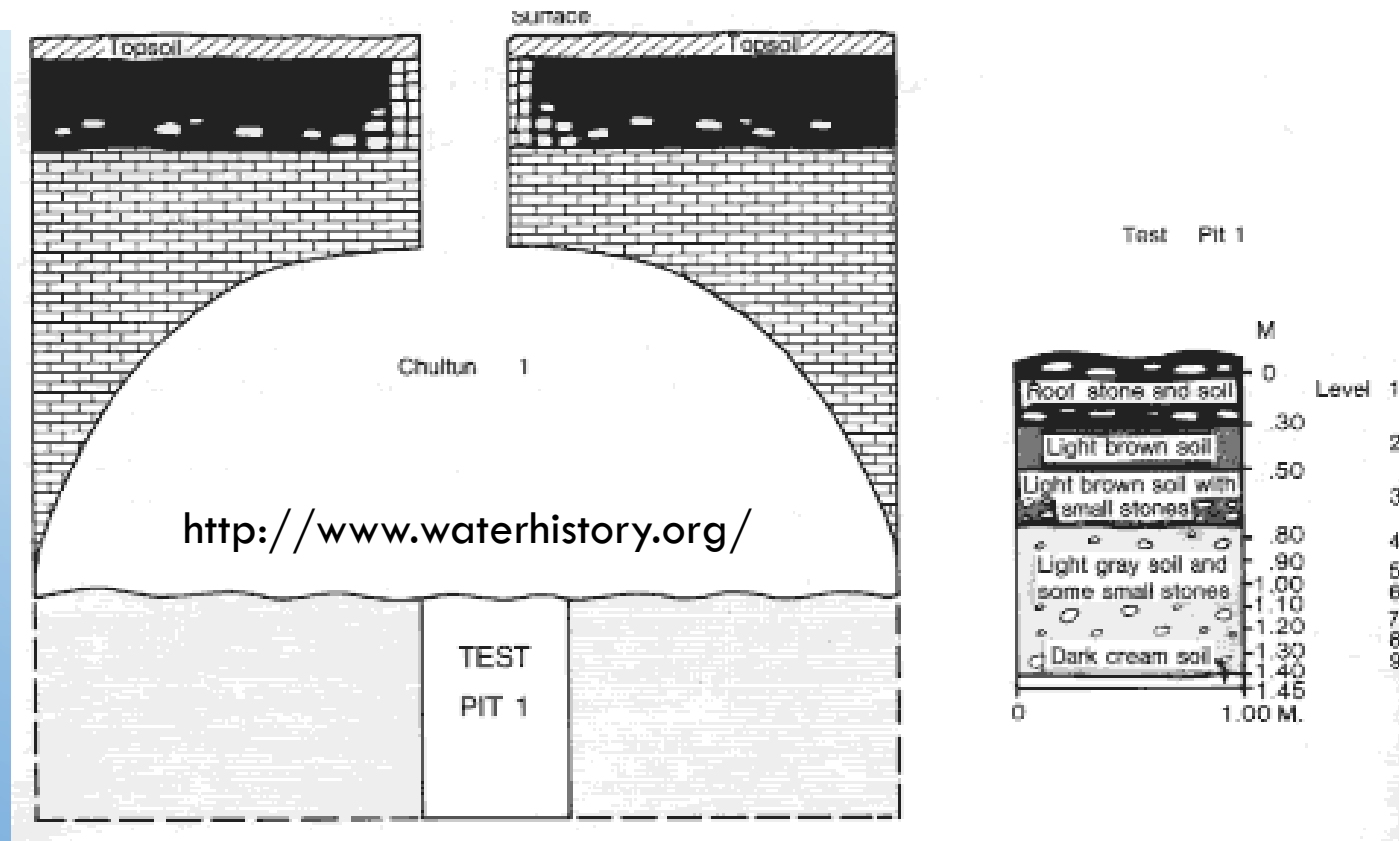
#HistoryOfFiltration

After 500 BC, Hippocrates invented the practice of sieving water and obtained the **First Bag Filter** called the '**Hippocratic Sleeve**'.

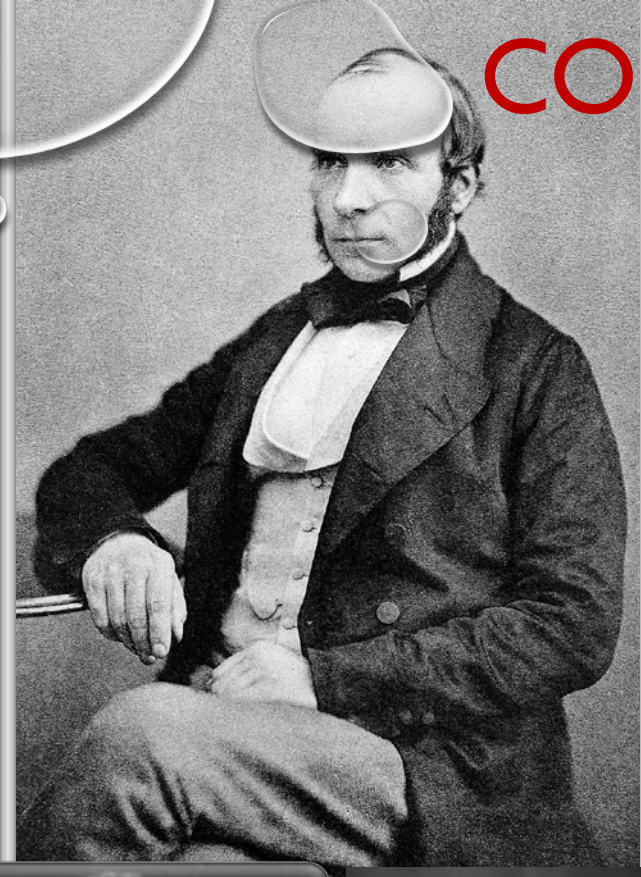


The Mayans constructed cisterns--call chultuns--in the limestone rock under buildings and ceremonial plazas. The Maya engineers devised drainage systems from buildings and courtyards to divert rain runoff into the chultuns to provide year-round water supplies in areas where cenotes did not exist, such as in northwestern Yucatan.

A chultun investigated at Edzna is fairly typical. It was bottle shaped in the cross section with a narrow restricted neck and a large globular-shaped chamber below (see illustration below). The total depth of the Edzna chultun was slightly more than 5 meters.



# CONTRIBUTORS





# Hypatia of Alexandria

By: Alexis Marshall

Works Cited  
page can be  
viewed here:  
<https://docs.google.com/document/d/1o33aLeLzDpPJzwoCG9ZMUykqWlQ1YofVV0jnlVLkJg/edit>

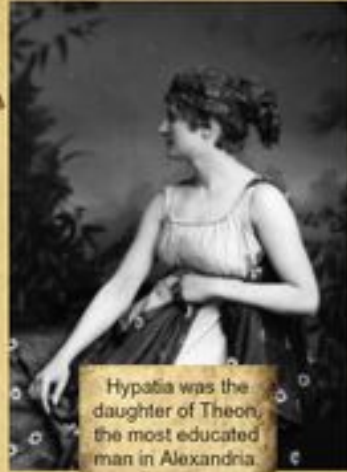


Born: 355 A.D or 370 A.D  
in Alexandria, Egypt  
*(Hypatia, 1995)*

Hypatia edited the book *On the Conics of Apollonius*. She made the book easier to understand which made the work thrive through many centuries.  
*(Hypatia, 1995)*

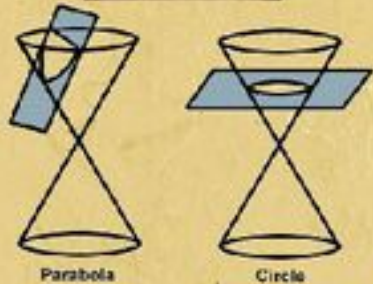
On her way home in 415 A.D. a mob attacked Hypatia. They stripped her, and killed her with peices of broken pottery.  
*(Hypatia, 1995)*

Conic sections are used today to describe planets' orbits, the paths of comets, and motions of rockets.  
*(Lorenz, 2012)*



Hypatia was the daughter of Theon, the most educated man in Alexandria

**Like Father like Daughter**  
Theon taught his daughter the different religions of the world. Hypatia learned to influence people with the power of words. Theon also taught her the fundamentals of teaching. People from all over came to learn and study from Hypatia.  
*(Hypatia, 1995)*



Parabola

Circle

Conic sections are the intersection of a plane and a cone. Depending on the angle of the plane, the figure formed is either a circle, a parabola, or a hyperbola.



Ellipse

Hyperbola

Hypatia was the first woman to have a significant impact on the survival of early theories in mathematics.  
*(Hypatia, 1995)*

Hypatia studied Astrology, Astronomy, and Mathematics  
*(Hypatia, 1995)*

Descartes, Newton, and Leibniz expanded on her work. Hypatia made extraordinary accomplishments for a woman in her time.  
*(Hypatia, 1995)*

## Works

- She invented the hygrometer.
- She also invented an instrument for distilling water.
- Her most important writings are: "The Astronomical Canon", a comment of the "Diophantus arithmetic" and the "Conic Sections of Apollonius of Perga."





# SOCIAL/GENDER IMPLICATIONS

## A women's crisis

Women are disproportionately affected by the water crisis, as they are often responsible for collecting water. This takes time away from work, school and caring for family. Lack of water and sanitation lock women in a cycle of poverty.





# DEVELOPMENT

- FILTRATION BECAME PREFERRED METHOD IN 17<sup>TH</sup> – 18<sup>TH</sup> CENTURIES
- 1804- PAISLEY, SCOTLAND, FIRST MUNICIPAL WATER PURIFYING PLANT
- 1827- SLOW SAND FILTERS IN GREENOCK, SCOTLAND, ROBERT THOM
- 1880'S- RAPID SAND FILTRATION IMPLEMENTED IN UNITED STATES

