History of Water Treatment

South Africa's tap water is considered of the highest quality in the world. But it doesn't start out that way. In fact, the water goes through a complex treatment process before it is considered safe to drink.

The history of water treatment is still being written, as discoveries continue to document its origins. There is evidence, however, that even in ancient times people saw the importance of treating water in some way before drinking it. Ancient Egyptians treated water by siphoning water out of the top of huge jars after allowing the muddy water from the Nile River to settle. Hipocrates, known as the father of medicine, directed people in Greece to boil and strain water before drinking it. In turn, the Romans passed water from aqueducts through settling basins to clarify it (remove impurities). Back then the focus was on the aesthetic quality of water i.e. if the water was clear and had no smell it was considered clean.

The first water facility to deliver water to an entire town was built in Paisley, Scotland in 1804 by John Gibb to supply his bleachery and the town and, within three years, filtered water was even piped directly to customers in Glasgow, Scotland.

In 1806, a large water treatment plant began operating in Paris. The plant's filters were made of sand and charcoal and where renewed every six hours. Pumps were driven by horses working in three shifts. Water was settled for 12 hours before filtration. In 1827 Englishman James Simpson built a sand filter for drinking water purification.

It was only in the 1870s that Drs Robert Koch and Joseph Lister demonstrated that microorganisms existing in water supplies can cause disease. Although by the start of the twentieth century, use of sand filtration sometimes preceded by some form of chemically assisted sedimentation or clarification was reasonably established, this did not prevent outbreaks of waterborne diseases such as cholera and typhoid. The first recorded use of chlorine on a permanent basis was in Middlekerk, Belgium, in 1902. This fundamental process is still used today, however, much work has been to refine the process since then.

Water is usually treated using the following steps:

- **Screening**: Screens or sieves are used to block large objects such as trash and leaves out of the water.
- **Flocculation**: The water is treated with chemicals that form a chemical floc which entraps dirt particles.
- **Rapid sand filters**: The use of rapid sand filters is the most common form of treating water. Passing flocculated water through a sand filter strains out the floc and the particles trapped in it.
- **Disinfection**: The filtered water is then disinfected with chlorine gas or another form of chlorine before it is pumped into the distribution system.
  (Source: Wikipedia, the free encyclopedia)

Other more modern water treatment technologies include the use of ozone or ultraviolet light. Water can also be purified using membrane technology. A membrane is a plastic sheet through which water is pushed under high pressure. This membrane acts as a barrier against pollution, leaving impurities behind.

DID YOU KNOW?

- The longest tunnel of any kind is the New York City West Delaware water-supply tunnel. It has a diameter of 4,1 m and runs for 169 km.
- Water leaves the stomach five minutes after consumption.
- An average tap left running can deliver 15 ℓ of water in one minute.
- Over 70 000 different water contaminants have been identified.

CHECK IT OUT!

The Water Research Commission has developed a new Education link on its website (www.wrc.org.za) for all those budding water scientists out there. The page provides fascinating insight into the world of water, such as water's unique properties. There is also information on the water cycle, dams, water treatment, groundwater, and water pollution, among others.