## The Development of Sanitation Systems

The first sanitation systems were built in the prehistoric Middle East, in the south-east of the modern country of Iran near Zabol. An inverted siphon system, along with glass covered clay pipes, was used for the first time in the palaces of Crete, Greece. It is still in working condition, after about 3000 years.

Higher population densities required more complex sewer collection and conveyance systems to maintain sanitary conditions in crowded cities. The ancient cities of Harappa and Mohenjo-daro of the Indus Valley civilisation constructed complex networks of bricklined sewage drains from around 2600 BC and also had outdoor flush toilets connected to this network. The urban areas of the Indus Valley civilisation provided public and private baths, sewage was disposed through underground drains built with precisely laid bricks, and a sophisticated water management system with numerous reservoirs was established.

Roman towns and garrisons in the United Kingdom between 46 BC and 400 AD had complex sewer networks sometimes constructed out of hollowed-out elm logs, which were shaped so that they butted together with the down-stream pipe providing a socket for the upstream pipe.

In some cities, including Rome, Istanbul (Constantinople) and Fustat, networked ancient sewer systems continue to function today as collection systems for those cities' modernised sewer systems. Instead of flowing to a river or the sea, the pipes have been re-routed to modern sewer treatment facilities.

This basic system remained in place with little positive change, until the 16th century, when Sir John Harington invented the first flush toilet as a device for Queen Elizabeth I (his godmother) that released wastes into cesspools. Despite this innovation, most cities did not have a functioning sewer system before the Industrial era, relying instead on nearby rivers or occasional rain showers to wash away the sewage from the streets.

The prevailing system was sufficient for the needs of early cities with few occupants, but the tremendous growth of cities during the Industrial Revolution quickly led to terribly overpolluted streets, which acted as a constant source for the outbreak of disease. As recently as the late 19th century sewerage systems in some parts of the highly industrialised United Kingdom were so inadequate that water-borne diseases such as cholera and typhoid remained a risk.

The first comprehensive sewer system was built in Hamburg, Germany in the mid-19th century, and the first such systems in the United States were built in the late 1850s in Chicago and Brooklyn. Initially these systems discharged sewage directly to surface waters without treatment. But as pollution of water bodies became a concern, cities attempted to treat the sewage before discharge. During the half-century around 1900, these public health interventions succeeded in drastically reducing the incidence of water-borne diseases among the urban population, and were an important cause in the increases of life expectancy experienced at the time.

## Are the following statements are TRUE, FALSE or NOT GIVEN?

- 1) Early sanitation systems became more intricate as city populations grew.
- 2) The ancient water management systems of the Indus Valley are still in use today.
- 3) Some sewage networks built by the Romans in the UK were made out of wood.
- 4) Rome had the most developed of all ancient sanitation systems.
- 5) By the time of Queen Elizabeth 1, the majority of cities had built sewers for waste water.
- 6) Poor sanitation systems during the Industrial era posed a significant health risk.
- 7) The world's first complete sewage network was constructed in the USA.

The correct answers are on page 3 of this document.

## Correct answers:

- 1. True
- 2. Not given
- 3. True
- 4. Not given
- 5. False
- 6. True
- 7. False

To practise some "Yes, No, Not Given" questions from the official IELTS website, click on the link below.

Yes, No, Not Given