

PLUMBING DNA

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The History of Plumbing Around the World

By: [BigRentz](#) on March 28, 2023

Visiting the bathroom is so much a part of your daily routine, you probably don't give it much thought. Brushing your teeth, using the toilet, washing your hands and taking a shower or bath are almost second nature. In fact, people use the bathroom an average of [six or seven times a day](#). During those moments, you're probably not paying attention to how toilets work or how much water it takes for waste to make its way through the plumbing and sewage system.

Modern plumbing advances have long been credited with boosting human hygiene and [eliminating contamination and disease](#). Although plumbing in general refers to bringing water in and wastewater out of your home, how plumbing has impacted cleanliness and health in our homes throughout the centuries is amazing. Germs are easily washed away with a turn of a knob, and waste is sent out of your home with the flick of a handle.

The developments that led to the modern plumbing system haven't always been effective or simple. It's taken thousands of years to innovate, refine, and perfect the process, and improvements are still being made. Here's a look at the history of plumbing and how this complicated system has gotten to where it is today.

Ancient Plumbing

3000 BCE: First sanitation systems for upper class

Mesopotamia likely created the first sanitation systems, which were in wide use by at least the third millennium BCE. Upper class society had separate bathrooms with indoor toilets in their homes, palaces, and temples. Slanted tile drains would carry waste to a cesspool or sewer system of clay pipes, which would then take it out to the river.

2600–1800 BCE: First urban sanitation systems

Many historians credit Harappa, Rakhigarhi, and the town of Mohenjo-Daro, in modern-day Pakistan and India, as developing the first urban sanitation systems.

In this area, individual homes drew water from wells through masonry conduits. Wastewater was sent from the houses to covered drains that lined the main streets.

Historians believe that cleanliness was important to the [Indus River Valley civilization](#) because even the smallest houses were connected to the public drainage system.

2500 BCE: First copper pipes

The Egyptians developed techniques that created copper alloys, which led to their early piping systems. In 1994, archaeologists excavating the remains of a pyramid's funerary complex discovered a [copper plumbing and drainage system](#). The pyramid itself was estimated to be about 4,500 years old, dating back to around 2600 to 2500 BCE. Egyptians believed that the dead enjoyed the same luxuries as the living, which explains the plumbing.

2000–1700 BCE: Oldest flushing toilet

The Mediterranean island of Crete gets credit for the world's first flushing toilet. This early toilet consisted of a stone seat placed over a channel of streaming water fed by pipes. A bucket or jug filled with water would allow the flushing action to occur.

2000–1000 BCE: First drainage and sewage systems

Around 1700 to 1500 BCE, ancient engineers on the Greek island of Crete created a drainage system by using the land's steep grade to maximize drainage for lavatories, sinks, and manholes. The system consisted of terra cotta pipes with perfect joint sockets, and the pipes were tapered to prevent sediment from building up. It was the most advanced drainage system of its time.

Inside a queen's bathroom from the time, archaeologists discovered a 5-foot-long bathtub that apparently was filled and drained by hand. The water was emptied into a cavity in the floor and, eventually, into the Kairatos River. Also, the bathroom contained what is believed to have been the world's earliest "flushing" water closet, separated by partitions and flushed by rainwater or water from cisterns.

510–31 BCE: Aqueducts in Rome to move freshwater

The Romans built aqueducts to transport water from the countryside into Rome. At one point, these aqueducts carried about [1.2 billion liters of freshwater](#) 57 miles every day. After the water passed through the aqueducts, it was collected in tanks and distributed through tunnels of pipes to baths, fountains, and toilets.

Wealthy Romans had hot and cold water, as well as a sewage system. Public bathrooms and water supplies would come later, as further advancements were made.

A fatal misstep took place around 200 BCE Roman engineers used lead piping to replace the system already in place. This dramatically improved the way that water was carried into the city. Unbeknownst to the Romans, however, lead piping contained toxins that got into the water, causing numerous [deaths from lead poisoning](#).

The lead levels skyrocketed to 10 times the amount that's safe to consume. Children and pregnant women suffered the most, with a rise of infant deaths and miscarriages. Scholars still speculate on how much the resulting decline in the size and general health of Rome's population might have contributed to the downfall of the Roman empire.

The Early Modern Era

1596: First urban flushing toilet (aka 'The John')

Fast-forward to 1596, about 500 years ago, Queen Elizabeth I's godson, Sir John Harington, created the first flushing toilet. Harington, who had been banished from the royal court for telling risqué stories, built a home and created the first flushing toilet. After forgiving him, Elizabeth visited her godson and was so impressed by his invention that she ordered him to build one for her at Richmond Palace . . . and bathroom goers ever since have invoked the inventor's name in "the John."

Mid-1600s: America's first citywide water system

Boston developed the first city water system in 1652. Early settlers came together and formed a corporation to build the "Conduit," a waterworks system for fighting fires as well as for domestic use. Most of the system's vent piping was made of hollowed-out tree logs.

1664: First water main

King Louis XIV of France ordered the construction of a cast-iron water main that extended 15 miles from a pumping station at Marly-on-Seine to the palace at Versailles. The main supplied water to the nearby town, and the piping served the palace gardens and fountains for more than 330 years.

1767: First mechanical shower

English stove and heater manufacturer William Feetham created and patented the world's first mechanical shower, known as the "English Regency shower." The shower consisted of a large basin, where the bather would stand, and an overhead water tank that pumped water upward from the basin via a hand pump.

Once the water was collected overhead, the bather would pull a chain, and the water would be dumped onto them, eventually collecting back in the basin. The water would then be reused over and over for the duration of the shower.

In the beginning, no one wanted anything to do with this contraption; the recycled water was dirty and cold. By this time, hot baths were common and seemed a lot better than “showering” in soiled water. It would take several years and major improvements — including the development of the water heater to provide a consistent flow of hot water inside the house — before the shower became a standard household feature.

1775: Prototype for the modern toilet

Nearly 200 years after Sir John Harington invented the first flushing toilet, Scottish inventor Alexander Cumming received the first patent for a very similar — but improved — device, with a few crucial additions. Cumming improved on Harington’s toilet, which hadn’t been able to refill on its own or eliminate the horrible smell.

Cumming’s prototype featured a device that linked the water inlet valve to the flush mechanism, allowing the pan to be emptied and refilled. Below the bowl, Cumming installed an S-shaped pipe (or “S-trap”) that created a seal with water, preventing sewer gas from entering the toilet.

1778: First flush toilet

Joseph Bramah improved upon Cumming’s design by adding a hinged valve at the bottom of the bowl. He patented his invention and his prototype became the toilet most commonly used on ships, boats, and planes.

1795: First water system for firefighters

When New York City’s population outgrew its plumbing system, it devised a new network of hollow logs to transport water for firefighting. The setup allowed firemen to access water by drilling through the walls of the “pipes,” then plug the hole after they were finished — giving birth to the term “fireplug.”

The Modern Era

1815: First water availability and safety measures

Philadelphia was the first U.S. city to recognize that safe and available water should be governed by municipalities. The Fairmount Water Works system replaced its inefficient steam engine system with a dam and water wheels across the Schuylkill River. The water was piped directly to the businesses and homes of paying customers, and free water was provided via fire hydrants to anyone with a bucket.

1819–1858: First cast-iron pipe system in America

Philadelphia became the first U.S. city to switch from wooden log pipes to a cast-iron system. The more durable plumbing system allowed users to regulate water pressure far better than with wooden piping.

Philadelphia had installed wooden log pipes as part of the city's new water supply system starting in 1800. By 1819, however, larger and more durable cast iron mains began to take over. Although the city stopped installing wooden pipes in 1832, they didn't remove them all from service until 1858. Residents could either get water for free from hydrants around the city or they could pay a \$5 annual fee to have the water piped directly into their homes.

1829: First hotel with plumbing

The Tremont Hotel of Boston became the first hotel of its kind to offer indoor plumbing for guests. The Tremont, designed by architect Isaiah Rogers, is considered the first modern hotel in the United States. In addition to featuring indoor toilets and running water, it offered free soap for guests to use at their convenience.

[“View of Tremont House, Boston”](#) by [Boston Public Library](#) is licensed under [CC BY-NC-ND 2.0](#).

1833: First plumbing in the White House

It’s odd, but true: A fancy hotel installed plumbing before the White House did. Until Andrew Jackson’s presidency, water was pumped to the White House from a well at the neighboring Treasury Building. Even when plumbing was finally introduced in 1833, only the main floor of the presidential home had that luxury. The second floor wouldn’t see plumbing until 20 years later, during the presidency of Franklin Pierce.

1835–1842: First municipal reservoir

Midtown Manhattan began construction of the first municipal aqueduct and reservoir system in 1835. Using water from the Croton River, the system began its service in 1842. The system was capable of delivering about [72 million gallons of fresh water](#) a day to city residents.

1848: National Public Health Act

England passed the National Public Health Act — which included notes on water health and safety and established a Central Board of Health — in response to several severe cholera outbreaks. The act had its flaws but served as a blueprint for later public safety acts. Recognized as one of the greatest milestones in public health history, it has been adopted and adapted by countries all over the world.

1855: First comprehensive sewer system in America

In the mid-1800s, Chicago completed construction of the Illinois and Michigan Canal and reversed the flow of the Chicago River. These two massive plumbing feats that helped transform the city into a national trade hub. During this same period, though, the burgeoning city also lost thousands of lives to multiple cholera, typhoid, and dysentery outbreaks.

To eliminate the swampy conditions that kept making its citizens sick, city engineers, by 1855, built the first sewer system that spanned a city. The city laid sewer lines

above the thoroughfares and covered them with dirt, elevating the streets by as much as 8 feet and literally raising the city out of the muck.

1857: First commercially available toilet paper

American inventor Joseph Gayetty began selling “medicated paper” made of hemp and aloe. He was so proud of his invention that each sheet carried a watermark of his name. The toilet paper was sold in packages of flat sheets and advertised as “the greatest necessity of the age!”

1870: First ceramic flushing toilet and water heaters

British pottery manufacturer Thomas William Twyford invented the single-piece ceramic toilet. Around the same time, water heaters began to appear in private homes, revolutionizing the American home later with improvements in cooking, cleaning, handwashing, and bathing. Initially, the water heaters would explode due to steam valves malfunctioning.

1871: Perforated toilet paper

Seth Wheeler came up with the idea to create perforated toilet paper, which makes it easier to tear off in sheets. He also patented the cardboard tube inside, making his vision nearly identical to the modern toilet paper that we use today.

1880–1891: The truth and myth of Thomas Crapper

Thomas Crapper made the toilet simpler and more practical by improving a few design elements. He invented the floating ballcock, which stops water from flowing into the toilet tank when it’s not needed.

Crapper also came up with the revolutionary “U” shape trap that controls sewer gas without needing more complicated valves. His design improved upon the “S” bend shape, which tended to dry out and clog.

[Crapper](#) was a successful plumber and sanitation engineer. But, contrary to popular myth, he did not create the flushing toilet — which long predates his arrival on the scene.

1883: First cast iron bathtub

Originally a manufacturer of farm implements, American John Kohler invented the cast-iron bathtub by modifying iron troughs used for watering livestock. He added four decorative feet and a smooth enamel finish and soon started doing big business in plumbing products and enamelware.

1930s: First standardized plumbing codes

Before he became the nation's 31st president, Herbert Hoover was one of the fathers of modern standardized plumbing codes for builders and plumbers, along with Dr. Roy B. Hunter. Hoover was an engineer and Secretary of Commerce in 1921, and Dr. Roy B. Hunter was head of the plumbing division of the National Bureau of Standards from the 1920s through the 1940s.

The first plumbing code in America, [published in 1928](#), honored Hoover by calling it the “Hoover Code.” Dr. Hunter's work is still referenced in U.S. plumbing codes used today.

1950s: First non-metallic pipes

Plastic piping was [introduced in 1952](#) in the United States, in response to the shortage of metals after World War II. Three years later, the first polyvinyl chloride (PVC) water pipes were laid in the U.S. Most pipes for plumbing throughout the country today are made of PVC material, due to its relative stability and low cost.

The Postmodern Era

1964: First smart toilet

Although many people associate smart toilets with Japan, they were actually invented by American Arnold Cohen. He patented the first “intelligent” toilet, which led to the revolutionary design and development of the advanced toilets you see today. Smart toilets include additional features not included in the original design, such as touchless flush, washing functions, and heated seats.

1978: First water conservation laws

California adopted a law stipulating that toilets may use no more than 3.5 gpf (gallons per flush). Previously, most toilets consumed at least 6 gpf. According to a report from 2013, because of California's dense population and propensity for drought means that for urban use, the state consumes about 2.9 trillion gallons of water per year. When it came to water connected to toilet use, 28% and 40% of that 2.9 trillion gallons was due to flushing.

1984: First pressure-assist toilets

Pressure-assist toilets offer an eco-friendly option to traditional gravity toilets. Although they often look like standard toilets from the outside, these powerful and economical units contain compressed air that pushes water into the bowl during flushing. In addition to using less water, pressure assist toilets are less likely to clog or break.

1992: U.S. Energy Policy Act

The United States Energy Policy Act reduced water-flow rates into plumbing fixtures. This act mandated the introduction of low-flush toilets and outlawed toilets that flush more than 1.6 gallons of water.

2003: First international standards

The International Code Council was formed to ensure a strictly enforced code and standard in all plumbing projects around the globe. The nonprofit council develops model codes and standards used worldwide to construct safe, sustainable, affordable, and resilient structures.

2015: Stricter conservation in California

California adopted one of the strictest water-saving standards in the country: No residential toilet in the state can flush more than 1.28 gallons of water at a time. Under this law, no urinal can use more than 0.125 gallons in a single flush, and kitchen faucets must use no more than 1.8 gallons of water a minute.

2022: Emergency water conservation in California

In response to ongoing drought, the State Water Board issued an emergency regulation that limits wasteful water practices. The rule requires not using potable water for non-functional purposes on grass, pausing irrigation systems after rain, not cleaning sidewalks or driveways with water, avoiding overwatering, and turning off water fountains that are only decorative.

Plumbing has evolved dramatically since the dawn of civilization. At one time, showering and using a toilet were luxuries that took lots of time and effort. Now you can walk just a few feet to your bathroom to do both in less than 30 minutes.

Hygiene and sanitation services are necessities we often take for granted. But the next time you flush a toilet or fill up a cup with drinking water, think of how far our bathroom fixtures and sewers have come. From a simple hole in the ground, civilization has developed elaborate citywide systems and sophisticated devices that make our lives healthier, easier, more comfortable, and much more pleasant.