

**WATER SUPPLY AND SEWAGE** Fresh water supply and waste water disposal were much the same in both urbanizing and rural areas in early America. Most inhabitants of the largest cities took fresh water from local wells or springs and disposed of waste in the nearest convenience: privies, streets, or rivers. The beginnings of modern water supplies from distant sources emerged at the turn of the nineteenth century in those cities where natural supplies became inadequate, unhealthy, or both.

After 1800 New York became the most populous city, but its sixty thousand people, clustered at the low southern tip of salt-ringed Manhattan Island, still relied on hundreds of public street wells, which had always been hard or brackish and were increasingly polluted. For six decades beginning in the 1740s, many New Yorkers had paid for "tea water" carted from a privately owned pump over a suburban spring just south of today's Chinatown. The quality of the Tea Water Pump declined precipitously around 1800 as habitation encroached. After the most devastating of the city's regular yellow fever epidemics killed two thousand people in 1798, Aaron Burr formed the Manhattan Company, ostensibly to pipe water from the mainland Bronx River. Through Burr's own influence as a state assemblyman, the company received a liberal state charter, including monopoly water rights and unprecedented banking privileges. Instead of pursuing the costly and technologically challenging Bronx plan, the company built a small reservoir and deep well fed by the same subterranean sources of the nearby Tea Water, laid a haphazard network of leaky hollowed pine-log pipes, and opened a bank, which flourished and thrives today as J. P. Morgan Chase. The growing city's water problems only worsened for three decades. After a devastating cholera epidemic in 1832, which killed 3,500, and a disastrous fire in 1835, city and state leaders united to build an aqueduct from the Croton River forty miles north in rural Westchester County. The gravity-fed Croton Aqueduct, completed in 1842, became the model for urban public water supplies and remains a component of the city's now vast water infrastructure.

Philadelphia, situated between two fresh rivers, had better wells and early water fortunes. In 1798 Benjamin Henry Latrobe conceived an ingenious public supply that raised water by steam engines from the Schuylkill River; the Centre Square Waterworks proved costly and inefficient but gave rise in 1811 to the Fairmount Waterworks on high ground a mile upriver. Put into operation in 1815, Fair-

mount by 1830 was world-renowned for its neo-classical waterworks buildings and river-powered waterwheels, which raised two million gallons of water a day into reservoirs for distribution by the first cast-iron pipe in the country. By 1837, 1,500 Philadelphia households had become the nation's first to have bathrooms with running water.

Boston, like New York, initially cast its lot with a private company, incorporated in 1796 to pipe water by gravity from nearby Jamaica Pond. Forty years later, the company sporadically supplied only 1,500 homes, at a time when a quarter of the city's 2,700 public wells were deemed foul. An adequate public supply was not completed until 1848, when an aqueduct brought water twenty-five miles from Long Pond. Baltimore, which overtook Boston as the nation's third-largest city at the opening of the 1800s, was supplied by excellent local springs and a civic-minded private company that operated a complex suburban pump works. Watering New Orleans, the country's fifth-largest city through the early 1800s, proved a deadly task. In 1811 Benjamin Latrobe secured the exclusive privilege of supplying water by steam engine from the mucky Mississippi, but yellow fever killed both Latrobe and his son Henry before the works' completion. Outdated when the city completed them in 1822, the works survived into the late 1830s when a private company built an expanded system. In Cincinnati, incorporated in 1819, a local association in the 1820s laid a tunnel from the Ohio River to a well on shore from which steam engines pumped water into reservoirs for distribution by gravity in iron mains and oak pipes. The city took over the works in 1839.

Smaller communities developed simpler water supply systems. Completed in 1755, the first pumped water supply in America served the Moravian settlement around Bethlehem, Pennsylvania, into the 1830s. Just before the Revolution, two private water companies briefly supplied Providence, Rhode Island, with water piped by gravity from springs a mile distant.

In communities large and small, sewage planning and sanitation generally lagged far behind fresh water solutions. When fresh water came from local sources, per capita consumption was only several gallons a day; when abundant distant waters were brought, per capita use jumped into the tens and eventually hundreds of daily gallons, and the waste issue became pressing. The words sewage and sewerage were not coined until 1834. New York did not start building underground sewers until the 1850s. Far beyond the early American period, waste disposal