Charles Dickens apparently found little to beguile him when he visited Philadelphia in the 1840's. He gave scarcely a page to the city in his American Notes, and was sourly amused at being overcome with "Quakery feelings," which manifested themselves in an urge to invest in the corn exchange. But when he got to the banks of the Schuylkill, he was deeply impressed: "Philadelphia is most bountifully provided with fresh water, which is showered and jerked about, and turned on, and poured off, everywhere. The Fairmount Waterworks...are no less ornamental than useful, being tastefully laid out as a public garden, and kept in the best and neatest order. The river is dammed at this point, and forced by its power into certain high tanks or reservoirs, whence the whole city, to the top stories of the houses, is supplied at a very trifling expense."

If this capture of a municipal waterworks seems strange, Dickens was only echoing the feelings of virtually every other visitor of his era. For the Fairmount Waterworks was not only a technological touchstone of nineteenth-century America; it was an aesthetic and social one as well. Indeed, by the close of the century, Fairmount had become a concise and incisive document of the making of our industrial society.

At the end of the eighteenth century, Philadelphia’s political and industrial leaders formed a committee of the Common Council to seek a solution to the yellow fever epidemics that had ravaged America’s largest city several times during the 1790’s. The members shared the general belief that polluted water caused the fever, and sought a
system that would replace the city's private wells, which were more often than not poisoned by nearby privy pits. A waterworks, the council debated, not only would check the epidemics, it also could pump fresh water through underground pipes for drinking and bathing, and up into the air through scores of fountains. And so Philadelphia embarked on the ambitious project of building the first extensive public water system in America.

Despite the imperative practical objectives, the works on the Schuylkill spoke of more than stark utility. Developed during the decades when American architects sought continuity with Western traditions, Fairmount reflected a series of revival styles: Roman, Greek, Italianate, Gothic. Moreover, the natural beauty of the site—as much a part of the design as the buildings themselves—impressed visitors as strongly as the powerful machinery. From the beginning, the social nature of Fairmount was recognized and made a part of the pioneer municipal water system. When, for instance, the Engine House was displaced in 1822 by the Mill Building, Frederick Graff, superintendent of the works, turned it into a Refreshment Saloon. And in 1835 Graff added a pavilion at the end of a walkway to the dam so that the many visitors could view the falling waters.

Much of Fairmount's appeal reflected the hopes of a young nation in the midst of an industrial revolution. Many visitors felt the works represented more than fine architecture amidst a splendid natural setting: its impact on the imagination came, rather, from a quality in our national self-perception. Beautiful to behold, the waterworks was also impressively useful; it hummed and clanked, first with steam engines, later with huge water wheels, and still later with even more potent turbines. These great engines rumbling on a pretty hillside made the Fairmount Waterworks a powerful symbol of technological harmony, of the new industrial machinery's capacity to exist beside the unspoiled beauty of the New World. Fairmount asserted to its admirers that America, unlike Europe, could develop a machine civilization without destroying the new Eden.

Romantic images of civilized machines in this American paradise abounded in the nineteenth century. Hundreds of engravings and lithographs pictured factory buildings tucked benignly in the smooth cradle of valley and river. Currier and Ives and other lithographers planted firmly in the American mind images of steam railroads chugging through wooded valleys, leaving undisturbed the happy folk in rude cabins. And, according to at least one student of nineteenth-century iconography, more artists made more images of the Fairmount Waterworks than of any other American scene of the era.

The operation of Philadelphia's waterworks during the first quarter of the century, however, did little to reinforce this romantic industrialism. Indeed, the abortive choice of steam power for the works made by the English engineer Benjamin Latrobe all but obscured the brilliance of his basic design. Latrobe, later the architect of the Capitol in Washington, apparently had been stricken with what was then
called the "steam-mill madness" of the English. Rejecting water power in his 1799 proposal to the Common Council of Philadelphia, Latrobe argued that steam engines were "the only means" to raise the water of the Schuylkill. He promised an excess of "power... far outstripping the bulk and the price of the engine." But the results were precisely the opposite: the steam-powered works never operated in the black.

These early failures, however, only underscored the tremendous technical success of Fairmount after the 1820's, when Graff, once Latrobe's apprentice, converted the system to water power. From that time, the works delivered water to the city, as Dickens said, at "a very trifling expense." In the first year of the water-powered system, the works operated at a profit for the first time in its nearly twenty-five years. A European traveler in 1836 wrote that it was "well worth a visit" because of "the simplicity... of... [its] construction."

These qualities of power and simplicity made Fairmount a captivating symbol of harmony between man's technology and nature's gifts. And it remained technologically current. Despite the increasing use of steam engines for transportation and manufacture after 1830, it was water that powered the growth of the national economy over the next two decades. Additional water wheels and reservoirs were added to the works several times in the 1830's and 1840's until, at mid-century, new turbine wheels began to supplant them. Thus, in crucial ways, the waterworks recapitulated the growth of the country before the Civil War. Begun when America still borrowed most of its industrial processes and machinery, by the 1860's Fairmount existed in a dynamic industrial community that was a leading force in the world of technology.

Fairmount's experience during the last decades of the century was quite different. Though the works' social functions grew as visitors continued to promenade the grounds, the technological system failed to change in any fundamental way. The turbines kept on efficiently pumping water, but new challenges to municipal water systems, especially the need for modern filters, were beyond Fairmount's capacities.

As industrial development north along the banks of the Schuylkill threatened to pollute the water before it was drawn off at Fairmount, the city stepped up its land purchases upriver, creating one of the nation's great urban parks. But all was for naught. Acidic waters from anthracite coal fields at the head of the Schuylkill had slowly moved downstream. Industrial and residential waste increased. Farmers along the upper reaches of the river drew off more and more water to irrigate their fields, thereby lowering the water level necessary for operation of the wheels. As Philadelphia grew into one of the world's great industrial cities, the demand for increasing amounts of water outstripped Fairmount's ability to provide it.

The harmony between machine and nature that had made Fairmount an American symbol of benign technology slowly faded. The works spent its last years ignominiously pumping what a contemporary critic called the "vile fluid of the Schuylkill" without even, he added, "benefit of sedimentation in a reservoir."

In 1909 the waterworks was shut down. With Fairmount's closing, America lost not only the most impressive artifact of her early industrial technology, but also a symbol of the belief that machine civilization might dwell harmoniously in the new Eden.

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These elegant, delicately tinted plans of the waterworks suggest something of the lofty aesthetic values the era saw in Fairmount. At the top of this page is a section of the Engine House, showing the massive, impractical steam engine, and below it is superintendent Frederick Graff’s drawing of the handsome masonry structure with which he clad the machinery. At the bottom is an overall plan showing the reservoirs, and the dam on the Schuylkill. The works did not turn a profit until water replaced steam power, a transition illustrated in the drawing on the opposite page. The upper plan shows the water wheel and forebay, the lower, the pump chamber. Ever mindful of the classical, the Common Council commissioned the allegorical woodcarving at bottom from William Rush. Christened Schuylkill Freed, it stood in a pediment above an entrance to the wheel-and-pump section of the waterworks.
Fairmount's turbines supplanted the water wheels at mid-century. Water ran in at the right through the rivet-studded flume to drive the turbine wheel, shown sliced in half in this woodcut. The wheel turned the cogs, whose shafts (not shown) drove the domed pump itself, forcing water up through the pipes to the reservoirs.

Overleaf: Today the works stand overshadowed by the Philadelphia Museum of Art. But they remain a tourist attraction and, saved from near ruin, are currently being restored by the Water Department of the City of Philadelphia.