Baltimore's first public utility

by LOUIS F. GORR
Superintendent of History
Fairfax County, Va., Park Authority

When completed in 1862 Baltimore's first city-built and city-owned water supply was the culmination of poor utility planning. While the project employed the best civil engineers the city could impress into service, they were hampered by political decisions based on expediency and whim. What had started out to be a landmark in the history of water supply ended by being obsolete on the day of its inauguration.

Following the water systems of other principle American cities, Baltimore was to have incorporated what its engineers considered to be the best features of each. But the Croton Aqueduct for New York, the Cochituate Conduit for Boston and the others provided their jurisdictions with fresh clean water as they were intended to do. They incorporated the latest techniques of civil and hydraulic engineering. By contrast, Baltimore's system failed to incorporate what its predecessors in other cities had learned. It certainly offered no improvement over the earlier systems in Baltimore as the city fathers had intended. The first public water works in Baltimore was the result of administrative decisions outweighing engineering facts.

At the outset of the project the city's fathers were in command and made the single most important decision that would affect every step of planning and construction. The city council early decided that the system would be gravity flow. Expressing the sentiment that what had been good enough for the ancients would be good enough for Baltimore, the council rationalized its decision by pointing to the success of the Cochituate and Croton works. The basis for that crucial decision was the council's collective belief that natural flow would be a flawless flow, unhampered and uncomplicated by mechanical contrivances. To that end they sought out engineers who agreed. They subordinated their staff engineers to the outside consultants brought in for the project. They purchased an entire water works on the pretext that it served the public interest to do so and then rebuilt the entire system in a way which was proven to be inadequate. They ordered their engineers to find ways of disputing the findings of other engineers with whom they disagreed. The city tried to fulfill its own prophecies.

These factors characterized the building of the water system and they were compounded by the need to acquire numerous parcels of land along the chosen route of the works. Real estate, condemnation thereof, and the inevitable political problems that result, were of primary importance in the planning. In affect, they dictated that the water supply route be located where the engineers said it should not be. At the same time, the city would not release the funds necessary to make the unsuitable route a workable one.

These matters seem largely trivial today (although they remain characteristic of local governments everywhere). The Baltimore Water Works began to be replaced almost the day it was opened. Nothing remains of the system save for a polluted lake and a few stone gate houses in the classical revival style, as if to mock what had once been described as "a stupendous feat, placing our great metropolis on the Olympian heights of the ancients and their hydraulic genius."

What follows, then, is a brief description of that early water supply venture, what led to it, how it was built, and why it failed. This discussion is based on scattered and incomplete documentary materials reposing in several Baltimore archives. It is also based on a physical inspection and recording of the entire route and facilities of the system. Because of the fragmentation of documentary and physical evidence, these comments are of necessity incomplete. However, they provide a satisfactory description of an early civil engineering project of a kind not usually recorded in recent technological history.

The City of Baltimore had a water supply as early as its incorporation in 1787, when the first city council was empowered to provide water for extinguishing fires. Pumps and wells were installed throughout the city, which at that time was centered in the Fells Point area on the inner harbor. Water came from the Jones Falls which ran through the city bisecting it from north to south. Baltimore's first attempt to develop a community water system resulted from a city council report in 1799 which recommended that pipes be laid by the city for the purpose of distributing water from Carroll Run. Work on the project was stopped the same year by irate property owners who objected to pipes being laid on or near their land. The city petitioned the General Assembly of Maryland for authority to introduce water into the community and in 1800 received the power. However, each subsequent attempt to construct a water system failed. In 1804 the city council resolved to "give public notice that proposals will be received (in the Mayor's) office . . . for introducing a copious and permanent supply of water into the city of Baltimore or any part thereof by any individual or company." The same year saw the creation of the Baltimore Water Company which by 1807 had constructed a water works on Jones Falls and installed a distribution system of wooden pipes.

By 1810 the wells and pumps originally installed for fire purposes were probably being used by the populace for domestic water supply. In that year the city developed several other sources of public water through the purchase of a number of springs. Four springs were bought and a fountain erected on each: the Western fountain was at Charles and Camden Streets, the Northern fountain at Calvert and Saratoga, the Eastern fountain at Eden and Pratt, and the Center fountain in Market Place south

of Baltimore Street. Those fountains were installed between 1810 and 1821, and the city gradually entered into the water business through the "back door."

The Baltimore Water Company was the foundation upon which the municipal works would be built. The company's facilities included two dams across the Jones Falls as suggested by these ruins in approximately the same location. The backpools they created were the storage lakes. Several Worthington and Boulton-Watt steam engines pumped water to three distribution reservoirs. The company's Chase Reservoir was located on North Charles Street, near the city boundary; a second reservoir was near Mount Royal, and a third was in the Rogers Hill area. Wooden pipes bound with iron straps distributed water to subscribers. The system provided two-and-a-half million gallons of water to the city each day from the Jones Falls, prized for its water.

The company expanded its service, improved its facilities, and increased its capital holdings throughout its nearly fifty year existence. At the same time other cities were building with publicly-owned supplies and the same urge struck Baltimore. Throughout the 1820's and 1830's the city made repeated attempts to undertake either construction of a rival system or the purchase of the company. Committees were established with regularity to ". . . enquire into the best modes of supplying every part of the city, in the most ample and wholesome manner, with a never-failing supply of clear and wholesome water . . ." The city tried to buy the Water Company in 1830, 1833, 1835, and 1837. For the next fifteen years there was widespread public and political dissatisfaction with the Water Company, not unlike current unrest with special utility districts unaccountable to the public good. It was true that the company had expanded, but it had only forty-seven miles of water lines by 1850. This fact irritated the city fathers who, although Baltimore was a smaller city, looked at Philadelphia's 117 miles, Boston's 106 miles, and New York's 225 miles of lines. By the early years of the 1850's the city government and its newly created Water Commission (which, due to innumerable and frequent reorganizations was known variously as the Water Commission, Water Board, and the Water Department) began to feel competitive with those larger cities. Moreover, there was a common belief that only a public utility could adequately supply water to the citizenry. There was also the fact that the Water Company, like utilities today, had grown wealthy and powerful. From the sale of water it realized an annual net profit of nearly a hundred thousand dollars by 1852. Additionally, the company had increased its land holdings and business ventures to include several hundreds of acres along the Jones Falls, including seven major cotton and grist mills.

Such extensive and speculative holdings combined with what the city perceived to be a less than satisfactory concern for its water business prompted an investigatory commission to write in 1852: "Private corporations are private speculations. They subserve the public interest so long as it may conduce to their own. Private gain is the design, the public good an incident. The Baltimore Water Company has done what a private citizen would have done for himself under similar circumstances, managed its business with an eye single to the interests of the stockholders." The commission opined that Baltimore was a city "destined to greatness" and that its citizens should be availed of the best public utilities possible.

By 1853 discontent with the Water Company's services had spread from the city offices to the citizenry at large. In that year a petition circulated in the city called upon the council to expedite ". . . the passage of resolutions . . . as to the propriety of introducing a bountiful and pure supply of water in (Baltimore)." A bill was introduced to condemn all the Water Company's property and to expropriate its services. The bill did not pass. However, within two years the city paid the Water Company the handsome sum of $1,350,000 for the company's entire corporate and capital holdings.

Thus the city of Baltimore was in the business of providing water and it seemed scarcely up to the job. For some months the city's officials, including the again reorganized Water Board, searched for some efficacious way of managing the newly acquired utility. Several consulting engineers had been hired in 1852, when it appeared certain that the sale of the Water Company would be consummated, and their first assignment had been to conduct a detailed survey of all existing sources of water in the Baltimore environs and the routes by which it could be brought into the city.

The city also instructed its consultants to report on the feasibility of abandoning all the facilities acquired from the Water Company. The correspondence and memoranda between the engineers and the city leaves no doubt that the city expected to abandon them. It would not have been an inherently poor decision in itself to abandon the existing facilities. There had repeatedly been expressions of desire to have only the latest and best of everything for the city's water supply. Also consulting engineers had located several excellent alternative sources of water, in accordance with their instructions. Each of these sources could have effectively been tapped. But at that point, the city officials and politicians involved in the project made their crucial decision. Perhaps it was because of the relatively vast sum the city had spent to acquire the Water Company. Perhaps it was because the Jones Falls route was the shortest of the proposed routes; the others were drawn from the Gunpowder Falls, Gwynn's Falls, Wetheredsville, the Stoney Run, and the Patapsco River. Perhaps it was because there had been financial shenanigans that had to be covered up in the purchase of the Water Company. Whatever the reason, the city decided to employ natural flow water supply, unassisted by pumps, and following the Jones Falls from a source on the Falls north of Baltimore. In other words, the city decided to use everything the Water Company had used except what had enabled the company to get water from one place to another. From a selection of four sources and thirteen routes, each of which provided

greater quantities of water, the city chose the one source and route that provided the least. In its search for the "most copious and bountiful supply of water," the city ignored the Gunpowder's 131 million gallons of water flow daily and the Patapsco's 115 million. Instead it looked to the Jones Falls with fifteen million gallons per day.

The decision flew in the face of nearly every one of the engineering staff, who had conducted extensive flow gaugings at key points along the other routes. Numerous other authorities appear to have favored the alternate sources and routes. Myndert Van Schaick, Superintendent of the Croton Aqueduct, and Montgomery Meigs, builder of the Washington Aqueduct, urged the city to reconsider its decision. Meigs wrote that Baltimore could have had a truly fine and modern works for the amount of money spent for the Water Company, ". . . the imperfect works she now uses, money enough to construct a great part of the largest works (the Gunpowder) proposed by her engineers." Meigs was invited to submit designs, which he did and of which only one drawing survives (of a pump house), but they were rejected. One of the principal consulting engineers, Thomas Chiffelle, insisted that the Gunpowder was the best source of the best water. Some members of the Water Department agreed, suggesting that either the Gunpowder or the Patapsco be considered. All led to an impasse, however, and in 1856 the Water Department complained to the Mayor that there were "angry feelings" over some of the proposed routes and water sources. According to one rhetorical report, "the people are angry, and they would rather see some decided advance towards its successful accomplishment than a continuation of the fruitless controversies in which we have heretofore been engaged, in utter disregard of what is known to be a crying necessity. The health of the city is threatened — fires are occurring in our midst without the power of the municipal arm to afford relief — while engineers are engaged in casting up their formulas, and building tempting theories on paper; and Gwynn's Falls, Jones Falls, Gunpowder, Patapsco, and Stoney Run, with their millions of gallons of water, are flowing on without interruption in their accustomed channels." Engineers may have been "casting up their formulas" and the result may have been "fruitless controversies," but one engineer who had it all figured out was James Slade, the other principal consulting engineer.

Slade, of Hartford, Conn., had worked previously on the Cochituate Conduit in Boston. Little else is known of the man, however, his remaining letters and memoranda in the city archives reveal a man determined to get his own way and adept at the game of bureaucratic politics that have long characterized public utilities. It seems clear that Slade had convinced the city very early that Jones Falls would be the best route for the water system and that the Falls would provide a good supply. He had been retained in 1852 and was thus privy to the transaction between the Water Company and the city. It is possible that he was instrumental in that transaction. What is more conclusive, however, is the fact that Slade had been ordered to prepare a detailed master plan of the entire Jones Falls from a point near Lake Roland to the Baltimore Harbor. Fragments of records indicate that he worked independently of staff engineers. Slade's master plan happened to be the only plan in existence at the time of the Water Company's sale. Thus, while staff engineers took flow gaugings and the politicians argued, Slade and his supporters had a plan ready to be implemented.

Slade's plan included the Stoney Run Reservoir for the lower service. The Stoney Run suggestion was unacceptable to the city, who refused to initiate condemnation proceedings against neighboring property owners to acquire right-of-way. With only a slight adjustment, a reservoir was planned at Hampden, which, although only a few blocks away, became the high service reservoir.

The Water Department, which had been reorganized again, used the opportunity of the city's refusal to condemn land near Stoney Run to urge the design of a reservoir at nearby Hampden Village. The Water Company's Mount Royal Reservoir would then be used for low service. The city had to purchase the necessary land at Hampden, and was able to do so at a cost less than land at Stoney Run would have cost. The land was purchased at retail value rather than by condemnation. In this regard, it is interesting to note that the city had acquired the Water Company by fair market value established by the Water Company, rather than by condemnation. By 1858, with the purchase of the Hampden land, the last step of the project could begin. Construction got underway and the water works became a reality.

The Baltimore Water Works, built in accordance with Slade's plan of 1853, consisted of eight principle components: Lake Roland, the Lake Roland dam, the conduit from Lake Roland to the Hampden Reservoir, Hampden Reservoir, the pipeline from Hampden to Mount Royal Reservoir, Mount Royal Reservoir, and the distribution network of water mains from each reservoir. Construction began first on the conduit, considered the central feature of the system. Shortly thereafter, construction started on the Roland dam and excavation of the lake. The conduit and its five tunnels were completed early in 1861, and construction continued on the dam. The two reservoirs took nearly two years to complete and were not ready for service until the spring of 1862. Unfortunately, other than a few scattered drawings, there remain no construction records so it is impossible to determine how well or how poorly the project was undertaken.

Lake Roland (earlier named Swann Lake) was situated in a natural ravine at the confluence of three streams and the Jones Falls. Slade had said in 1853 that with only slight excavation the lake would be well-suited as a storage reservoir. The surrounding land, he wrote, had little value for cultivation, so natural run-off would supply the lake with a never-ending supply of fresh water. There is nothing to suggest that Slade

considered the problem of siltation and soil erosions, factors which later condemned the lake.

About fifty acres of land surrounding the ravine were excavated, creating a water surface of about 116 acres, or about 500 million gallon storage.

Water was distributed to individual homes and public fountains by a distribution network extending outward from Hampden and Mount Royal Reservoirs. Hampden supplied the areas of the city between 112 and 188 feet above tide, Mount Royal served those between 112 feet and tide level. According to one map published in 1862 Lake Roland was to have serviced mains leading to areas between 188 and 320 feet, but there is no corroborating evidence either in surviving plans or in the physical remains. This fact is another curiosity of the water system, since it had been a primary objective of the city to provide water to the high areas, a deficiency of the Water Company that had been pointed out with regularity in the 1840's and 1850's.

Still another curiosity of the Baltimore water supply is in the planning of the distribution network of water mains. Population figures for 1854 had demonstrated that 23,500 persons resided in areas of more than 100 feet above tide; 156,500 persons lived below that level. Yet the Mount Royal Reservoir, the smaller of the two reservoirs, was used to serve more of the population. The fact that it was the low service facility does not seem to compensate for its small capacity relative to the population it was supposed to have served. By contrast, the larger reservoir at Hampden served areas only sparsely developed.

The new water system, Baltimore's first really public utility, was inaugurated in 1862. There was much hoopla and speechmaking, and the newspapers glowed in their accounts of the achievement. Baltimore somehow had been transformed into a civilized city, ranking with the ancients, and symbolized by the classical temples that served as gate houses and waste weirs. Mount Royal became a favored place for Sunday promenades. The new works would truly provide Baltimore with wholesome water copiously for many years to come.

The rhetoric attached to major public works projects seems quickly to fade. So it was in Baltimore. By 1864, just two years after the works was completed, there were serious questions raised about the deficiency of the system. The quantity of water was insufficient from the outset, a fact which was probably for the best, since the water was contaminated. The slopes around Lake Roland drained into it. Siltation was a problem acknowledged but not contended with. Water officials felt that waste materials and silt could settle to the bottom of the lake. Remaining solids could settle in the reservoirs, each of which was fitted with an endless belt of copper mesh at the effluents. The mesh, however, was only an eighth of an inch, hardly adequate to capture small particles. Throughout the 1860's typhoid outbreaks occurred with some regularity, and many citizens who could afford to do so dug their own private wells. Efforts in the 1860's to lay a public sewage system failed repeatedly because of the great expense involved. Accordingly, the new water system occasionally served double duty.

By 1865 the water officials were seriously into the designing of a new works. In that same year excavation was begun at Druid Lake, just across the Jones Falls to the south from Hampden, By 1870 the old Rogers Reservoir was opened again and a new reservoir excavated adjacent to it. In 1871 the new Druid Lake was completed with the construction of an earthen dam, the first major earthfill dam in America. Also built at Druid Hill were a pumping station and an additional high service reservoir and engine house.

An extended drought in 1869, accompanied by a water famine, prompted the city to look beyond the Jones Falls area. After substantial investigations (including re-examination of the tests of the 1850's) it was decided that the Gunpowder would be the new source. A temporary pumping station was built on the Gunpowder in 1873; it pumped water from the Gunpowder to Roland Run, a tributary of Jones Falls, until 1881 when a major dam was built across the Gunpowder. At about the same time a reservoir was excavated at Montebello. A pumping station pumped water into a tunnel which led to Lake Clifton, a reservoir built soon after and of which nothing remains. The Eastern Pumping Station at Lake Clifton, a stained glass fantasy, pumped water into the distribution network. By 1885 the Baltimore water system was one of the most advanced and extensive in the country. Ironically, it employed many of the recommendations urged by the engineers in the 1850's.

In 1803 an ordinance was introduced by the City Council "Providing for Introducing a Copious and Permanent Supply of Wholesome Water into the City of Baltimore. Similar ordinances and resolutions were more copious than the water they called for over the century. It was not until the city had experienced the failure of its first municipal works that it would have the needed water. The money wasted on the works built in the middle of the century (there appear to be no extant records documenting the exact cost of the project) helped Baltimoreans learn how to build a good water supply. Next to nothing remains of that project today outside of a few engineering drawings, official memoranda, and letters. There is even less for the archeologist to study first-hand. Perhaps that is as it should be, and perhap it is a fitting non-monument to what was, by all indications, a boondoggle.

Perhaps also this is as it must be in studying technology, which in the American experience, at least, has been marked by impermanence and replacement. Like so much of technology itself, the remains of past technologies are gone, replaced by improved ones. What in the nineteenth century was called "improvement" and "ingenuity" is today known as "planned obsolescence." In Baltimore in the 1850's the politicians who disagreed with their engineers achieved the same end. □