History Comes *Alive!*

Tales From the City Archives

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'There It Is. Take It.'

As the City marks the 100th anniversary of the completion of the LA Aqueduct, Mulholland's annual reports illustrate the challenges in building it.

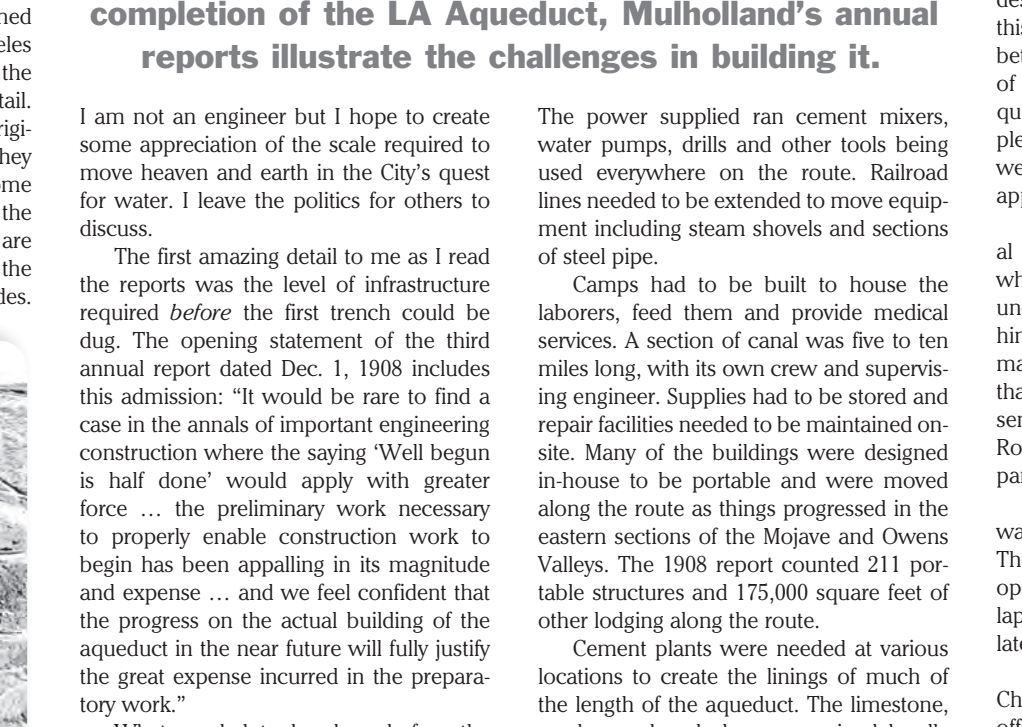
Photos by Photos courtesy City Archives

"There it is. Take it." Two sentences with a total of five words.

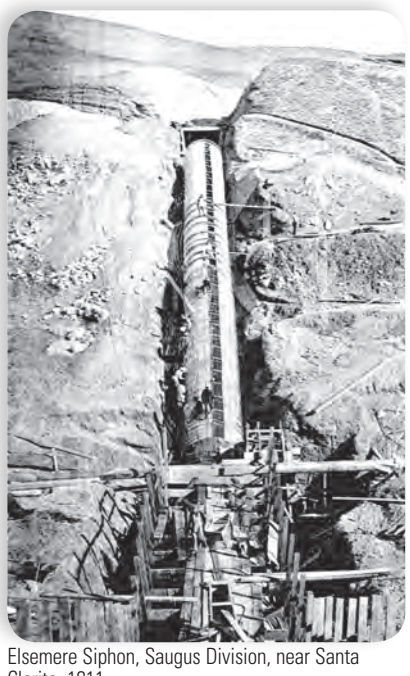
When the signal was given at the Cascades near Sylmar on Nov. 5, 1913, the first water to pour through the canal had started its journey eight months earlier in the Owens Valley at another opening ceremony. William Mulholland, who had overseen the entire project and knew more about it than anyone else, expected to address the 30,000 to 50,000 people on hand that Wednesday afternoon outside Los Angeles. It's possible that he believed that no words could properly explain what he knew and what he felt about one of the greatest feats of modern engineering. But there is much more to the story based on the facts about the aqueduct.

The reality was that William Mulholland delivered a much longer speech that afternoon, which was described by witnesses as being somewhat "off the cuff." But the self-taught engineer had been speaking out on the virtues of the project, whether it was supporting bond measures to start and complete the aqueduct or defending it from its critics, using the highly technical facts and details of the trade. His public crusade began some years before his being appointed Chief Engineer for the project in 1905 and for the rest of his life after 1913.

Beginning in 1906, Mulholland submitted a series of annual reports on the progress of the canal to the newly formed Board of Public Works and the Los Angeles City Council. These documents catalog the building of the aqueduct in exacting detail. The Los Angeles City Archives has the original copies of Mulholland's reports. They are typed – possibly dictated – but some reports have penciled corrections in the Chief Engineer's own hand. The reports are full of the details familiar to the world of the water, construction and engineering trades.



The finished aqueduct in Olancha Division, near Independence in the Owens Valley, 1911.



Elsemere Siphon, Saugus Division, near Santa Clarita, 1911.

I am not an engineer but I hope to create some appreciation of the scale required to move heaven and earth in the City's quest for water. I leave the politics for others to discuss.

The first amazing detail to me as I read the reports was the level of infrastructure required *before* the first trench could be dug. The opening statement of the third annual report dated Dec. 1, 1908 includes this admission: "It would be rare to find a case in the annals of important engineering construction where the saying 'Well begun is half done' would apply with greater force … the preliminary work necessary to properly enable construction work to begin has been appalling in its magnitude and expense … and we feel confident that the progress on the actual building of the aqueduct in the near future will fully justify the great expense incurred in the preparatory work."

What needed to be done before the actual digging could start? Water was needed for construction and domestic uses, which necessitated the laying of pipes and sinking artesian wells. Telephone lines were needed for communication. Electricity was provided by the City by power lines stretching for miles.

Dams and generating stations were built along the way as part of the greater project. The power supplied ran cement mixers, water pumps, drills and other tools being used everywhere on the route. Railroad lines needed to be extended to move equipment including steam shovels and sections of steel pipe.

Camps had to be built to house the laborers, feed them and provide medical services. A section of canal was five to ten miles long, with its own crew and supervising engineer. Supplies had to be stored and repair facilities needed to be maintained on-site. Many of the buildings were designed in-house to be portable and were moved along the route as things progressed in the eastern sections of the Mojave and Owens Valleys. The 1908 report counted 211 portable structures and 175,000 square feet of other lodging along the route.

Cement plants were needed at various locations to create the linings of much of the length of the aqueduct. The limestone, sand, gravel and clay were mined locally and moved either by custom-built spur rail lines or, in some cases, via aerial tramways to be mixed and poured at the rate of 1,000 barrels per day by 1911. The alternative would have been teams of mules pulling wagons on roads too narrow or steep to be usable. Some cement canals were being dug and poured while steel siphon pipes were being constructed for areas where canals couldn't be used. Later additions to the project included covers for open sections of the canal to reduce evaporation.

More than 47 miles of tunnels were dug. The most challenging of these was the Elizabeth Tunnel, near Elizabeth Lake and the newly created Fairmont Reservoir, at just more than five miles long through a mountain of granite that was dug from both the north and south sides simultaneously. The 1911 sixth annual report proudly described the results this way: "The connection was made of the two headings on February 28, 1911 after forty months of work… the Board of Engineers estimated five years to complete. The center line of the tunnel met within 1 1/8" and the grade checked within 5/8" and came under the original estimate by almost a half-million dollars."

The 1911 report recorded 3,814 men involved in the aqueduct at its peak, but seasonal factors created fluctuation in the employment numbers. Mulholland's letter attached to the fourth annual report of 1909 states that "the aqueduct has been abundantly supplied with labor up till about three weeks ago … this can be attributed to two causes: First the warm weather, which makes the conditions of the desert somewhat arduous in the summertime; and second, the demand at this time for harvest hands … it is hoped that this situation is but a temporary one." The 1911 report describes the mood of the work camps this way: "There exists a spirit of rivalry … between the camps, not alone in the speed of executing the work, but also as to its quality and cost." Bonuses for work completed ahead of schedule and under budget were paid to the workers and had been approved by the Board of Public Works.

The most casual reading of the annual reports confirm the sheer enormity of what Mulholland had overseen. It could be understood how one reporter described him at the dedication as "a slow, silent, tired man." Another newspaper account claimed that the Chief Engineer sat down after presenting the flowing water to Mayor Henry Rose, smiled, laughed and said to no one in particular, "Well, it's finished."

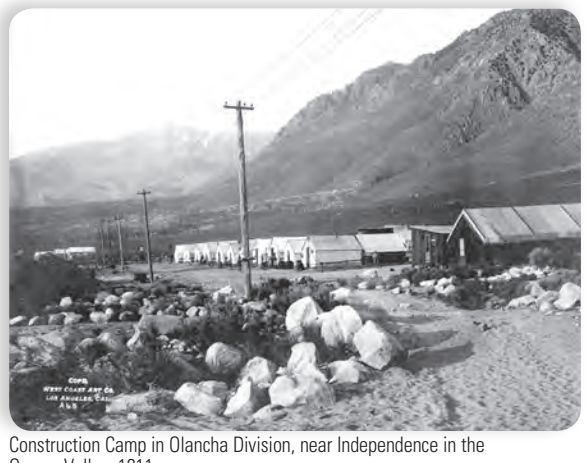
It wasn't, of course. A second aqueduct was planned and built during the 1920s. The first dam in San Francisquito Canyon opened in 1915 and the second one collapsed in 1928. But those are stories for a later time.

Mulholland's great-grand daughter, Christine, said recently at an event kicking off the centennial events with the DWP that, "After this Centennial, there will be no great attention paid to the aqueduct again in any of our lifetimes."

There are several events planned for the Aqueduct Centennial at www.laaqueduct100.com and I hope you'll find a way to take part in our local history in what is truly a once-in-a-lifetime opportunity.

Lining the conduit with concrete in Olancha Division, near Independence in the Owens Valley, 1911.

A steam shovel working in Boulders in Olancha Division, near Independence in the Owens Valley, 1911.



Construction Camp in Olancha Division, near Independence in the Owens Valley, 1911.