

Pueblo sited along Los Angeles River

Central to the Los Angeles Bicentennial celebration is the Los Angeles River, a vital water source necessary for locating a pueblo in this semi-arid area.

Two hundred years ago, Don Gaspar de Portola camped at a site on the east bank of the Los Angeles River (near the present North Broadway bridge) that was deemed "very suitable for a mission and a large settlement."

That site, similar to other early Spanish American villages founded in the southwestern part of the United States, was called a "pueblo."

By 1781, that pueblo had developed into a settlement named El Pueblo de Nuestra Senora la Reina de Los Angeles de Porciuncula.

From 1781 to 1902, the early settlers depended on a water system of wood and brick storage tanks, crude dams, water wheels, and hollowed logs. And as Boyle Workman wrote in "The City That Grew:" "Always, the shadowy fear of water famine lay across the pueblo. Always, the people dreaded a shortage. Such a crisis never really loomed, however, until the city had a population of 300,000. Yet, through all those years, water remained the critical problem of the pueblo that developed into a city."

And yet, ironically, excessive water in the form of rainy season flooding was another continuing problem. In fact, as recently as 1958, additional concrete lining was constructed along the river channel in certain areas completing the necessary flood control protection for people and property during times of heavy runoff.

Today, it is estimated that 45 million gallons of water available to



the Los Angeles River is consumed daily in Los Angeles.

Legal controversy over rights to the waters of the Los Angeles River have plagued the city since issuance of the original grant from the Spanish king, Carlos III. From 1874 to 1902, the pueblo water rights of the City of Los Angeles had been the subject of litigation in more than a dozen cases. On January 26, 1979, the final judgment on a case that lasted more than 23 years was entered by the California Superior Court, granting these Native (Pueblo) water rights to the City of Los Angeles forever.

Efforts to secure adequate water supplies for Los Angeles is an inseparable part of the history of Los Angeles. It is a fascinating story that begins with a pueblo "water man" selling water from two earthen jars hanging from a yoke slung across his shoulders to a complex network of pipelines and reservoirs serving almost three million people.

A handwritten signature in dark ink, appearing to read "Louis H. Winnard".

Louis H. Winnard
General Manager and Chief Engineer

May-June 1981

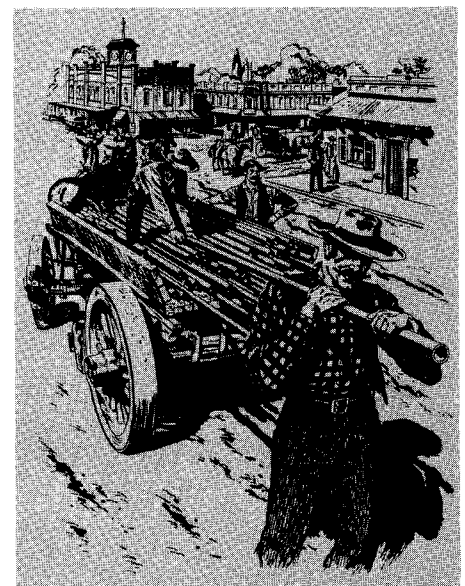
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This month's cover:



Water and energy have played a vital role in the development of the City of Los Angeles over the past 200 years and will continue to do so in the future. See article beginning on page 8 outlining the history of Los Angeles from the perspective of water and power.



LOS ANGELES . . . 1781—1981

The story of Los Angeles' efforts to secure adequate water supplies and power is an inseparable part of the history of the City.

While the Department of Water and Power began with the establishment of the first Los Angeles municipal water works system in 1902, its roots are firmly planted in the soil of earliest Los Angeles history. In 1781, when the pueblo of Los Angeles was founded, the Los Angeles River water supply was put to use through the establishment of a distribution system of crude dams, water wheels and zanjas. The zanja system continued in operation until 1903.

In 1857 the need for more modern methods of domestic water distribution sparked construction of the first water main system of hollowed logs. A giant water wheel on the Zanja Madre, largest of the open ditches serving Los Angeles, and a wood and brick storage tank in the Plaza, were major components of the new distribution system.

The domestic water distribution system was leased in 1868 for 30 years to a private company which began construction of a system of supply lines, cast iron and steel water mains, and storage reservoirs. However, by the end of the contract period in 1898 there was widespread disenchantment with the private operators who were charged with meeting neither the letter nor the spirit of their contract. The City reacquired the water system for \$2 million on February 2, 1902 after almost four years of negotiation. Three days later the City's first Board of Water Commissioners was established to manage that system.

The original municipal water bureau and subsequently a municipal power system grew to become today's Los Angeles Department of Water and Power—the nation's largest municipal utility operation.



Hernando Villa's colorful painting of a 19th century zanjero is on the top floor of the Department of Water and Power General office building. A zanjero patrolled and tended the ditches, or zanjas, that made up the first distribution system for the City's water supply. Zanjas were phased out of the Los Angeles water distribution system by 1903.

POPULATION OF LOS ANGELES*

Year	Population
1790	141
1800	315
1810	415
1820	650
1830	770 (est.)
1840	1,250
1850	1,610
1860	4,385
1870	5,728
1880	11,183
1890	50,395
1900	102,479
1910	319,198
1920	576,573
1930	1,238,048
1940	1,504,277
1950	1,970,358
1960	2,479,015
1970	2,811,801
1980	2,966,358

*Los Angeles grew in size from 28.1 square miles in 1850 to 464 square miles in 1980.

DUTIES OF
DEPUTY ZANJEROS.

ALL DEPUTY ZANJEROS shall be under the control and subject to the order of the Zanjero, and it shall be their duty to patrol and keep close watch over any and all Zanjas, Reservoirs, Ditches, etc., placed under their supervision, to see that the water is properly divided to those who have claims, and the only proof of such claims shall be the production of Water Permits, and they shall acknowledge no exchanges of water between irrigators unless previously reported to them; neither shall they acknowledge any exchange of water by irrigators inside the city with those outside the city limits; they shall wear a police badge, and arrest all persons using the water without a Water Permit, and report their names to the Zanjero, and also to the Committee on Zanjas of the Council, in writing, and the Zanjero shall also report the same to the Council in his weekly reports. They shall visit those who are using the water at least twice a day—morning and afternoon—unless prevented by a break in their ditch that absolutely requires their attention; they shall immediately report to the Zanjero all breaks, and the names of irrigators who suffer from loss of water, and they shall carry a shovel, and shall immediately repair all breaks in their power, and, if not in their power, shall call upon the Zanjero for assistance.

For dereliction of duty a Deputy Zanjero may be suspended by the Zanjero, subject to the action of Council.

By Order of the Council of the City of Los Angeles.

W. W. ROBINSON,
Clerk of the Council.

Los Angeles, June 15th, 1879.

LANTERNS LIGHT UP LOS ANGELES

One hundred and thirty years ago, the only street lights in Los Angeles were the lanterns people hung on the doors of their homes or stores.

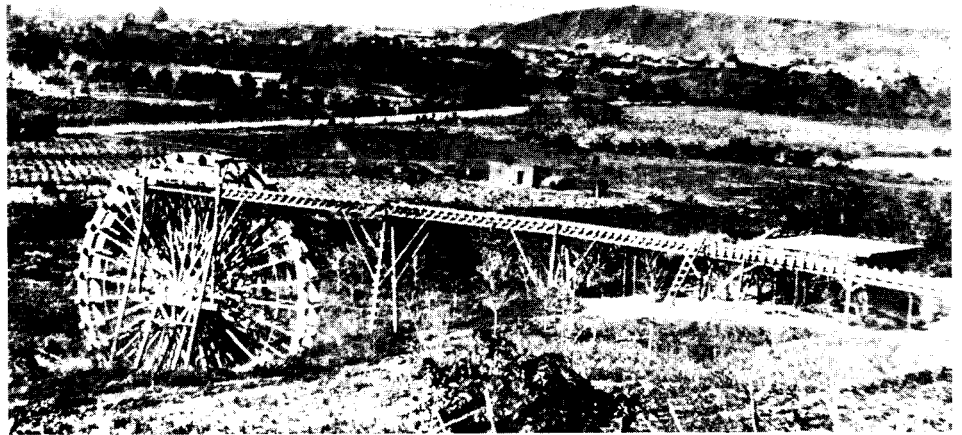
And even these wouldn't have been too much in evidence if the newly formed Los Angeles Town Council hadn't enacted an ordinance in 1850 which read: "Every owner of a store or tavern, and every person that lives in a house of more than two rooms facing to the street, shall put a light at the door of said house during the first two hours of every dark night."

Los Angeles was a community of 274 dwellings, with a population of 1,610 and an area of four square miles when it was incorporated as a city by the State Legislature at San Jose on April 4, 1850. Today, Los Angeles has expanded to 464 square miles.

In 1850, each owner had to light his own lantern. Today, almost all of the system is automatically turned on and off.

Most of the lamps are controlled by clock-operated switches which are adjusted for the varying times of sunset and sunrise throughout the year. They turn the lights on about 15 minutes after sunset, and turn them off about 25 minutes before sunrise.

About a third of the street lights are controlled by new photo-electric cells which control turning the energy on or off according to the level of natural light.



Water was delivered to Los Angeles residents by means of a large wooden water wheel which lifted water from the Los Angeles River to a height necessary to flow into the town.

Large Wooden Water Wheel Lifts Water From L.A. River

A little more than 120 years ago, the principal method of delivering water to Los Angeles residents was by means of a large wooden water wheel which lifted water diverted from the Los Angeles River to a sufficient height to flow by gravity into the town.

The water wheel was installed in 1859, and the townspeople contributed their labor to build it. A small amount of water could be stored in the city's first reservoir, a tiny brick structure located in the old Los Angeles Plaza.

From the Plaza the water was delivered to the city which then had a population of about 4,400 and

covered only 30 square miles.

Today the city is more than 600 times as large in population and over 15 times as big in area.

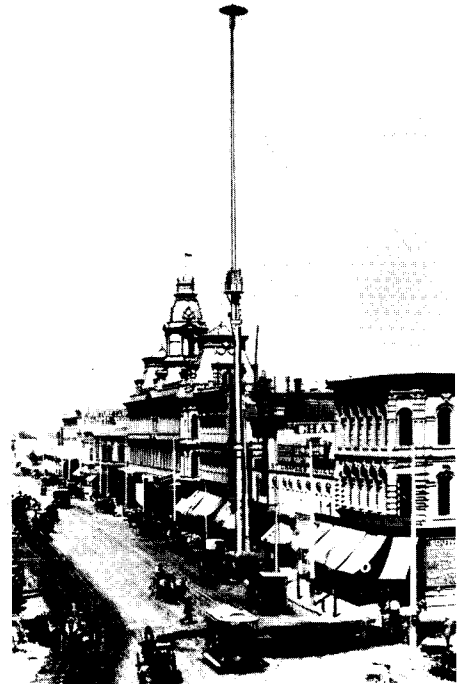
Despite the growth of the city, the original water source, the Los Angeles River's underground basin, still is able to provide water for about 17% of the City's population. The remainder is served by water from the High Sierra via the Los Angeles Owens River Aqueduct system, which meets about 78% of the city's requirements, and by the Colorado River Aqueduct, which meets about 2% of the needs and the California State Aqueduct, 3%.

1857



Wooden water pipes carried water to a few customers in 1857. These hollowed logs formed the first pipeline system in Los Angeles.

1882



First street lights in Los Angeles date back to 1882. Seven 150-foot masts with electric arc lights were placed in the downtown area of the City.

Hollowed Logs First Pipeline

Back in 1857 wooden pipes carried water to a few nearby users from the City's first reservoir, a small wooden trough perched on top of a brick structure in the old downtown Plaza.

This first pipeline system made of hollowed logs served only a small part of the 28 square miles that then comprised the City's area. The wooden pipe system supplemented the original "zanjas" or ditches which

brought water to the City's orchards and gardens.

Today, more than 6,944 miles of distribution mains fan out through the City's 464 square miles to provide more than 494 million gallons of water per day to 2.9 million persons. Water is delivered at many elevations ranging from sea level to altitudes of 2,400 feet.

With construction of the Second Los

Angeles Aqueduct and the California State Aqueduct there is provided an additional 500 miles of new mains and 30 miles of trunk lines needed to distribute the additional water. New reservoirs also must be built to keep an ample supply of water on hand to meet peak demands and emergencies.

Approximately \$57 million will be expended by the Water System during the 1980-81 fiscal year.

Electricity Comes to Los Angeles

On New Year's Eve, 1882, the City of Los Angeles was lighted for the first time by electricity.

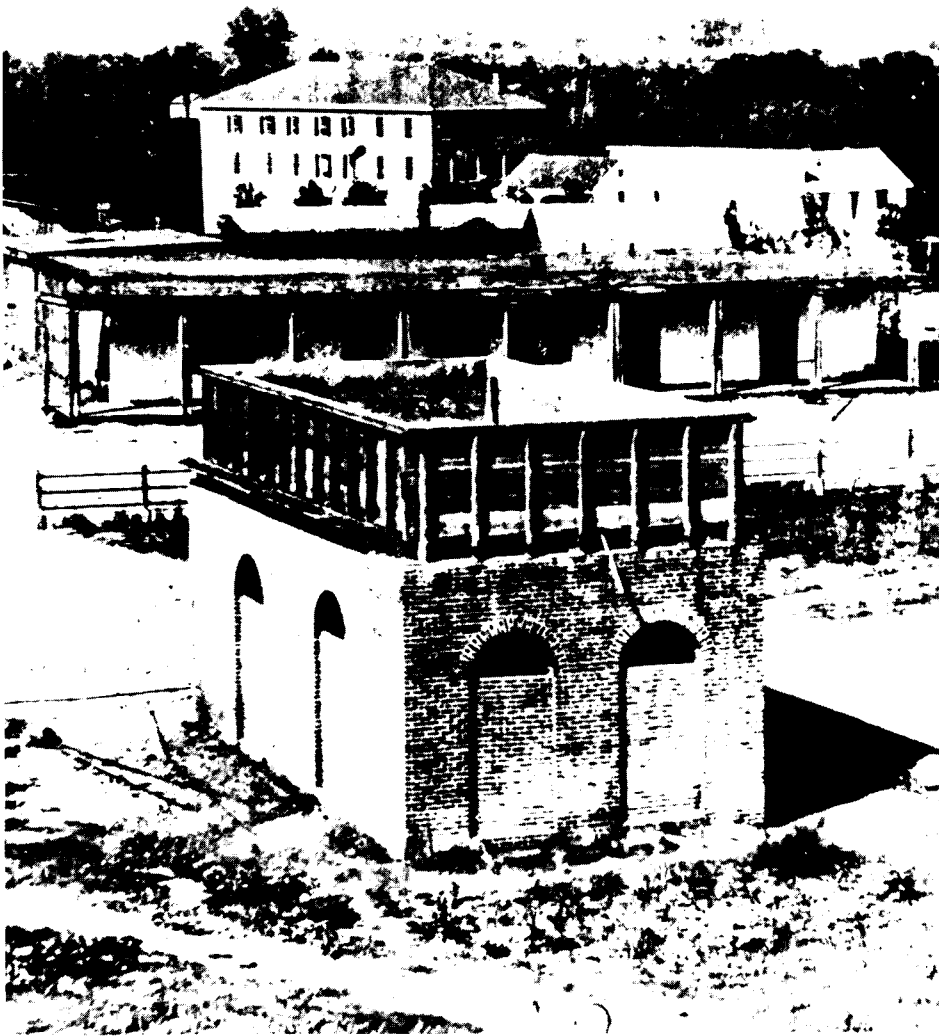
Los Angeles was just beginning its spectacular rise from its small town population of only 11,183 recorded in the 1880 census; but it was among the nation's first cities to install electric street lights.

Electric arc lights were placed atop

seven masts, each 150 feet high. A mast light was placed at each of these locations: Main and Commercial Streets; Fourth and Charity (now Grand Avenue); Sixth and Main; First and Hill; First and Vine (now Central Avenue); First and Boyle; and the intersection of what is now Avenue 22 and North Broadway. In all, eight miles of wire were strung.

It was at 7:30 p.m. on December 31, 1882, that the electric lights were turned on, and a milestone was passed in the history of Los Angeles.

Today, the City has about 220,000 street lights, fed by more than 6,000 miles of street lighting circuits, to furnish light to the City's 464 square miles.



Location of the first reservoir in Los Angeles was in the Plaza area. It was a tank of hewn planks with a brick foundation.

Plaza Location of First Reservoir

In 1860, when Los Angeles' population was only 4,385, the hub of the City was the old Plaza, and in the Plaza was the City's first reservoir.

Perched atop a brick foundation, the reservoir was a simple tank of hewn planks held together by bolts and tie-rods. The tank was only 20 x 30 feet and held about 80,000 gallons. That would be less than a one-day supply of water for 500 persons at today's rate of use.

Today, 107 reservoirs of the

Department of Water and Power store water for use by Los Angeles' 2,966,358 population, spread out over a 464 square-mile area, and living everywhere from sea level to altitudes of 2,400 feet.

DWP water engineers are continually planning and building additional reservoirs to make sure that Los Angeles will always have enough water on hand to meet peak needs whatever the demand may be because of hot weather or severe emergencies that may arise.

Historical Highlights

- 1781 El Pueblo du Nuestra Senora la Reina de Los Angeles founded September 4 with 11 families comprising 44 persons as first settlers.
- 1828 Each owner of a house of more than two rooms on a principal street required by ordinance to hang a lighted lantern before his door, during the dark of the moon, from twilight to 8 p.m. in winter, 9 p.m. in summer.
- 1850 City of Los Angeles incorporated under laws of the United States, April 4.
- 1882 First electric outdoor lighting, with arcs inaugurated New Year's eve, installed on seven 150-foot poles, located at Main Street near Commercial Street and at First and Hill Streets.
- 1890 Electricity first used for house lighting in Los Angeles.
- 1902 City of Los Angeles acquired title to all properties of the Los Angeles City Water Company and affiliate corporations, at a cost of \$2,000,000, February 3. Included in the purchase were six reservoirs with a total capacity of 202 acre feet, infiltration galleries, two pumping stations, 535 fire hydrants, 325 miles of pipe, 319 meters and 23,119 services.
- 1913 Los Angeles Owens River Aqueduct dedicated November 5, at the Cascades. First aqueduct water reached San Fernando Reservoir.

1916 First distribution of municipal electricity began November 13, with energy purchased from Pasadena municipal plant.

1936 First Boulder Power reached Los Angeles October 9; regular operation, under contract, began October 26.

1943 First 65,000 kilowatt generator placed in operation at Harbor Steam Plant.

1954 Valley Steam Plant Unit No. 1 synchronized to Power System, September 1.

1958 Scattergood Steam Plant's 156, 250-kilowatt turbine generator No. 1 synchronized to Power System on December 7.

1960 A gold plated meter, signifying the one-millionth meter installed by the Department in the City's electric system was set in a private home in the Northridge area of the San Fernando Valley on May 17.

1962 Haynes Steam Plant's 230,000 kilowatt-turbine generator Unit 1 was synchronized to the Power System September 2.

1965 General Office Building at 111 North Hope Street was dedicated on June 24, 1965.

1968 Sylmar Switching Station, terminus for the 800-kilovolt d-c Intertie line, placed in service November 29.

1970 The Second Los Angeles Aqueduct placed in operation on June 26.

1971 Unit 1 of Mohave Generating Station was released for firm operation on April 1.

1973 Unit 1 at Castaic Power Plant was synchronized to the Power System on July 11.

1974 The 750,000 kilowatt Unit 1 at Navajo Generating Station was initially synchronized on February 1, and placed in commercial operation on May 31.

1979 On January 26, after more than 23 years of litigation, the City's rights to all of the native waters, as well as waters imported by the City to the groundwater basin, were confirmed in the judgment filed in the Los Angeles Superior Court.

1979 350,000-kilowatt Unit 1 at Coronado Generating Station was synchronized to the Power System on July 21.

1936



Power from Boulder Dam reached Los Angeles October 9, 1936, lighting up downtown area.

200 YEARS OF GROWTH

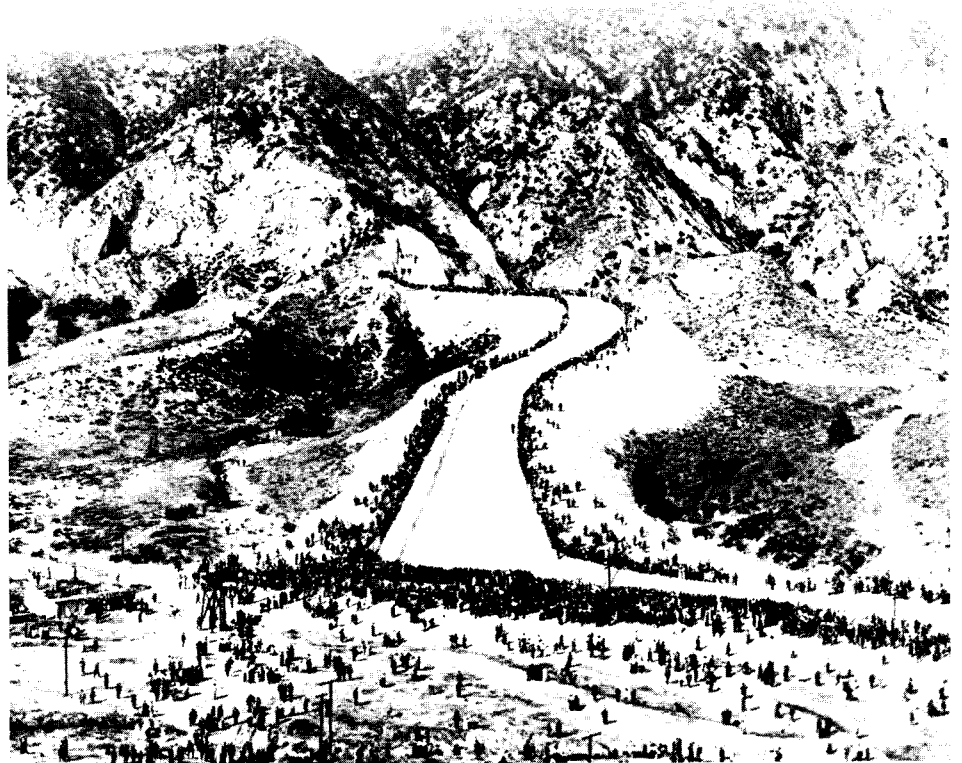
It Began With a Generator

Just 73 years ago, in April 1908, in the shadow of the towering snow-clad High Sierra, the Division Creek Power Plant Number 1, Los Angeles' first municipal power plant, was placed in operation.

The powerhouse was a small frame building with a tiny 120-kilowatt generator. It harnessed the flow of a small creek tumbling down from the High Sierra, producing hydroelectric power for construction work on the new Los Angeles Owens River Aqueduct which was just getting started at that time. It was the first known use of electricity for a construction project of this kind.

The Division Creek plant would be infinitesimal in comparison with

1913



Los Angeles Owens River Aqueduct dedicated November 5, 1913, as first water flows down the Cascades in the San Fernando Valley.

1909

today's giant power generators serving Los Angeles electric customers. Just one of the six huge generators at the DWP's Haynes Generating Station, for example, has over 2,800 times the capacity of the little unit at Division Creek, with a capability of producing 343,000 kilowatts.

Electric generating units keep getting bigger as new ones are designed, and the Department of Water and Power has plans for generators more than twice the size of the biggest at the Haynes Station on the drawing boards.

All this is part of the process by which the DWP is meeting ever increasing demands with reliable power service.



A small frame building with a tiny 120-kilowatt generator constituted the first power plant for Los Angeles, Division Creek Power Plant No. 1. Located south of Bishop, California, it began operation in 1909.

1916

Municipal Distribution of Electricity Begins

Sixty-five years ago, municipal distribution of electricity began in Los Angeles. The organization that became the DWP Power System started delivering electricity to the first few hundred customers on November 13, 1916.

The City did not yet have its own power plant to generate electricity for Los Angeles, and the first electrical energy sold was obtained from Pasadena. It wasn't until April 1917 that the city's San Francisquito Canyon Power Plant No. 1 came on the line.

From these small beginnings have evolved the largest municipally owned power system in the nation. Today the Department of Water and Power serves 1.2 million customers.

In addition to Power Plant No. 1, the DWP has hydro power plants along the Owens River Aqueduct, operates most of the generators at Hoover Dam, has four major steam power plants in the city and jointly participates in the operation of generating plants located outside of Los Angeles.

From one distributing station in 1916, the system today has grown to 166 distributing stations and 19 receiving stations.

The City of Los Angeles has had an amazing growth and development in the last 65 years; growth made possible in part by an assured availability of power—whenever and wherever needed.



Delivery of electricity in Los Angeles began on November 13, 1916. First power pole was set at Piedmont and Pasadena Avenues.