

Longest Aqueduct in the World.

For the Los Angeles Water Supply—Costing £4,900,000.

Written and Illustrated for the "Graphic."

FOR seven years the City of Los Angeles, California, has been engaged in one of the most stupendous tasks ever undertaken by a municipality. Confronted by a constantly decreasing water supply and a rapidly increasing population, the municipality is building a steel and concrete aqueduct, 240 miles in length which will tap the everlasting snow fields of the Sierra Nevadas and deliver the precious fluid in copious quantity at the City's gates. January 1, 1913, should see the completion of the enterprise, at a total expenditure of £4,900,000.

With the construction of the Panama Canal and the Cat-kill Mountain Water system of New York, the Los Angeles aqueduct stands as the third largest hydraulic engineering enterprise now under way on the Western Hemisphere. Not alone is the enterprise interesting from the fact that this water course is the longest aqueduct in the world, but it is worthy of note for the reason that it is being built across the heart of the great Mojave Desert (pronounced Mohave) for a distance of 150 miles and in order to reach the City of the Angels it tunnels through the heart of a mountain range for 26,870 feet.

In addition to providing a domestic water supply for an ultimate population of 1,500,000 people, there are as economic features the irrigation of 135,000 acres of dry land contiguous to the City and the development of 120,000 horse power of hydro-electric energy from a total fall in the aqueduct of 1500 feet. The story is well worth the telling.

Los Angeles, the metropolis of Southern California, with a population of 375,000 and growing at the rate of 30,000 each year, is situated well within a semi-arid region called the Pacific Coastal Plain. To the south and to the west is the broad expanse of the Pacific Ocean; at her back rises the Sierra Madre Range; beyond lies the Mojave Desert, thence on 150 miles across a barren waste of sand and the Sierra Nevadas, forming the roof-peak of the United States, lift their snowy heads to an elevation of over 14,000 feet.

A DRY COUNTRY.

The rainfall along this comparatively narrow strip of coastal plain between the mountains and the sea is scant indeed. About Los Angeles the annual average precipitation is 15.67 inches, all of which is confined to the period extending from November to March. The

Los Angeles since its village days has obtained its domestic water supply from the Los Angeles River, a stream which now, excepting in time of flood, rarely if ever reaches its ocean outlet. A thirsty city drinks not only its surface, but also its subterranean flow and still remains with thirst unquenched.

Growing more rapidly than any first-class city in the United States, as shown by the census of 1910, Los Angeles undertook to find a supplementary source of water supply. This she finally discovered in the Owens River, a mountain stream that drains the eastern face of the Sierra Nevadas for a distance of 150 miles and after collecting the drainage of 3,000 square miles flows into Owens Lake, an alkaline sink devoid of outlet, situated on the northern edge of the Mojave Desert.

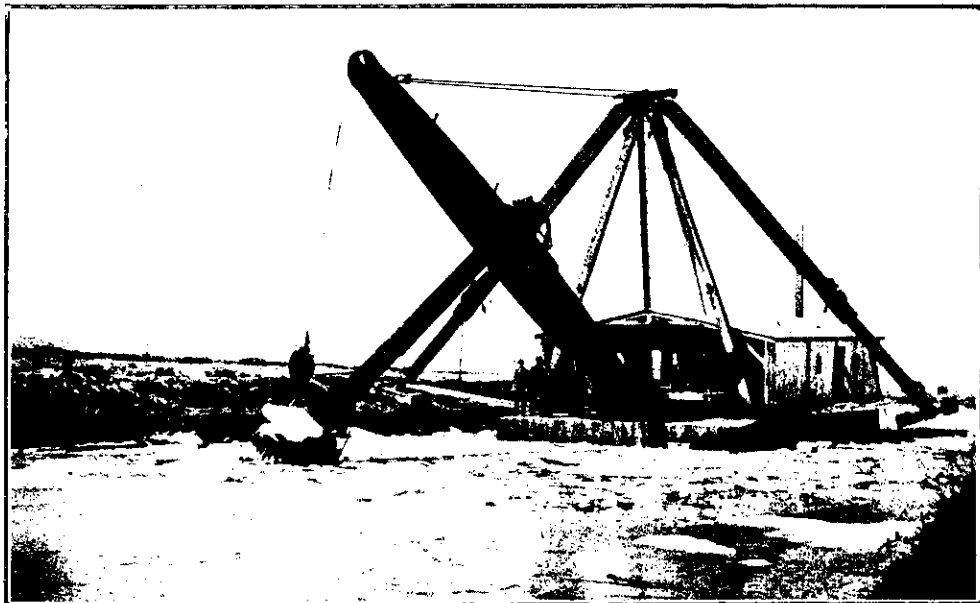
In 1904 Los Angeles began the acquisition of rights to the waters of this river and on July 1, 1905, she had acquired more than 120 square miles of land in the Owens Valley, with their appurtenant water rights of more than 20,000 miners'

acres, 1906, and after having been inspected and approved by the three foremost hydraulic engineers in America—Freeman, Stearns, and Schuyler—the City in June of 1907 voted £4,600,000 worth of bonds for the completion of the enterprise.

AT THE BACK OF BEYOND.

The next eighteen months were devoted to preparation for the actual work of aqueduct excavation. This long period of equipment will be understood when it is explained that the line of the aqueduct zone was from five to seventy miles from a railroad and extended through a region devoid of habitation and without means of communication, water or any of Nature's aids to the sustenance of human life other than pure air and boundless sunshine.

In return for the contract to transport the 20,000,000 tons of materials required in the work, the municipality required the building of a standard gauge steam railroad across the Mojave by the Southern Pacific Railroad Company.



ONE OF THE ELECTRIC DREDGES AT WORK ON THE CANAL.

remaining seven months are a succession of days of continuous sunshine. Wherever water is available for irrigation, Nature richly rewards the labour of its application to the soil. Vegetation springs up with the virile luxuriance of the tropics.

To cover the cost of these purchases, the citizens of Los Angeles voted the first bond issue of £300,000.

With more than 100 engineers in the field and after running 2,000 miles of preliminary lines, the final survey of the giant water course was located by De-

Then the City began the construction of a system of 315 miles roads and trails, some of the former being hewn out of mountain walls of rock at a cost of over £1800 per mile. Where the aqueduct zone was inaccessible, because of the impossibility of road construction, tramways and aerial cable-railways were installed.

Water was found far back in the mountains, and, by four water works systems with 150 miles of mains, was piped wherever needed. Reservoirs at high elevations guard against interruption of the service.

As a means of communication, a modern telephone system with branch lines into every camp and with a total mileage of 600 miles was installed in the Los Angeles general offices, and extending to the intake of the aqueduct in the Owens Valley.

For motive force to drive the excavating machinery, three hydro electric plants generating 3300 horse power, were built on two mountain streams debouching into the valley, and a high voltage line, 200 miles long, was installed to transmit the magical energy for lighting and motive power wherever it was desired.

The estimates called for the consumption of 1,250,000 barrels of Portland cement. City engineers discovered valuable deposits of limestone and clay (the main ingredients) in close proximity to the aqueduct zone and midway between the intake and the outlet. A cement mill was erected, the total cost of this municipal venture being £290,000, and today the City is grinding and delivering cement at the rate of 30,000 barrels per month. Even with the completion of the aqueduct for whose construction it was designed, it is hardly likely that the property will be sold, as it is considered a most desirable asset in the large public work the City has under way.



Heldy, photo.

PUTTING TOGETHER THE GREAT STEEL SIPHON, 8,000 FEET IN LENGTH, AND 11 FEET IN DIAMETER.