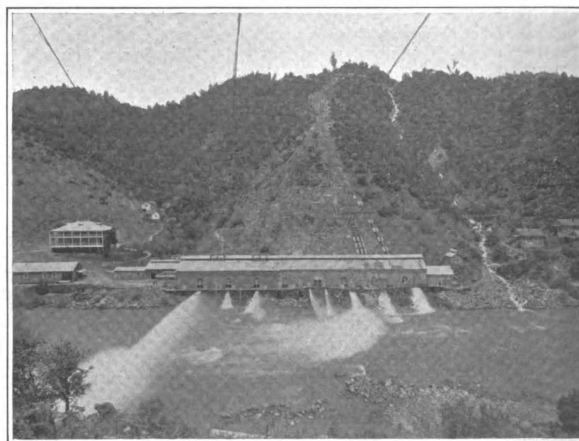


The Colgate flume—over seven and one half miles long.



Hydro-electric power plant at Colgate.

## Hydro-Electric Development in California

### A General Survey of the Present Situation

By John A. Britton

A GLANCE at a map of California similar to that accompanying this article, on which is portrayed the veritable network of long-distance transmission lines that mark the course of hydro-electric development from end to end of the State, might convey to one not acquainted with actual conditions, the impression that there is but little left undeveloped of the sources of water-power with which this wonderland of the West abounded when first adventurous man started out in his now far-reaching enterprise among the head-waters of our mountain streams.

This impression has, indeed, been circulated widely by those who in pursuit of a policy of so-called conservation would hinder the development of California's natural resources, and so, her progress and advancement. What foundation it has in fact may be gathered from certain statistics to hand. Mr. M. O. Leighton, Chief Hydrographer of the United States Geological Survey at Washington, in an article on "Water-power in the United States," published in the May number, 1909, of the *Annals of the American Academy of Political and Social Science*, writes: "The water-power plants in the United States make productive use of only 5,500,000 horse-power, less than one fortieth of that ultimately available." The report of the United States Geological Survey upon California, published March, 1912, gives the following figures for our State:

Potential horse-power development on a basis of 90 per cent efficiency; minimum 4,109,000, estimated maximum 9,382,000; on a basis of 75 per cent efficiency, minimum 3,424,000, estimated maximum 7,818,000.

And the total amount of water-power development in the State of California to-day stands at, in round numbers, 450,000 horse-power!

It is safe to say, however, that this total bids

fair to be materially increased within a very short while. Important developments are now in process of construction, a very necessary undertaking in view of the rapid increase in California's population, an increase which undoubtedly will mount by leaps and bounds when the great International Exposition to be held in San Francisco in 1915 brings visitors from all parts of the world to view the marvels which Dame Nature has heaped with so lavish a hand on our Golden State. And so we should congratulate ourselves, perhaps, that the development of our natural resources is yet only in its infancy. It reveals California as a land of infinite possibilities, where there is room and plenty for all who come to settle in her spreading valleys, and by their enterprise and energy help to place her where she belongs among the great States of the world.

As matters stand at present it may be said that the water-power development of California is controlled, to the extent of something like 86 per cent, by seven large corporations. The largest and most comprehensive of these, of course, is the Pacific Gas and Electric Company, which operates over thirty counties in the State of California and has a present hydro-electric development of about 91,000 horse-power. The next largest is the Great Western Power Company, operating also in a large portion of northern central California, with 53,000 horse-power; the Sierra and San Francisco Power Company, covering a portion of the same territory, with 50,000 horse-power; the Northern California Power Company, operating, as its name would suggest, in the extreme north of the State, with 45,000; the Southern California Edison Company, operating in the territory around Los Angeles, with 38,000; the Pacific Light and Power Corporation, running over almost the entire territory from Tehachapi to the southern border, with about

20,000; and the San Joaquin Light and Power Corporation, operating in the San Joaquin Valley and making a sort of connecting link with the Pacific Light and Power Corporation, with about 25,000 horse-power.<sup>1</sup>

There are some smaller companies also worthy of mention here, as, for instance, the California-Oregon Power Company, one of whose water-power plants lies within our State limits and has a 9,000 horse-power capacity; the Oro Electric Corporation, operating in the Sacramento Valley, which has a present installed capacity of 4,000 horse-power; the Western States Gas and Electric Company, controlling the distributing system in and around the City of Stockton, with a similar amount; the Snow Mountain Power Company, in the Eel River District, with 3,000 horse-power; and the Mt. Whitney Light and Power Company, operating in the neighborhood of the oil districts, with 8,000.

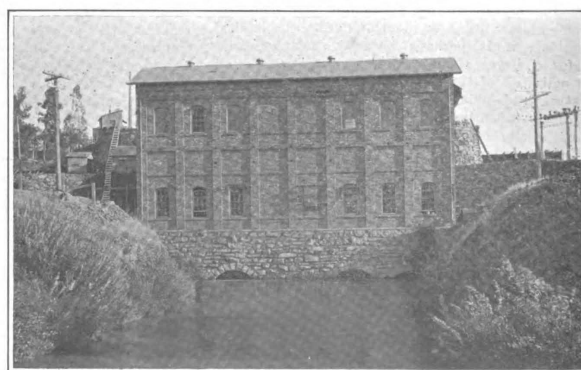
Let us start, if you please, at the northern boundary of California and travel down through the State, taking in the various hydro-electric developments as we reach them and sketching briefly the organization and operating system of each, with such improvements and extensions as are known to be either in process of actual construction or in contemplation for the immediate future.

We begin with the California-Oregon Power Company, which operates in both States named. This is an amalgamation of the Siskiyou Electric, Rogue River Electric and Klamath Falls Electric Power Companies and was organized in January, 1911. Its territory ranges from Merlin, above Grant's Pass, in Oregon, on the north to a point about ten miles south of Castella, in Shasta County, California; an area of about 10,000 square miles. It has two power-plants located in California, one

<sup>1</sup>See SCIENTIFIC AMERICAN SUPPLEMENT, March 8, 1913, p. 152



Dam and intake of canal on American River—Folsom power system.



Power plant at Folsom—the oldest in service.