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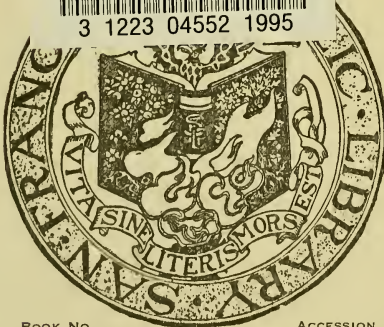


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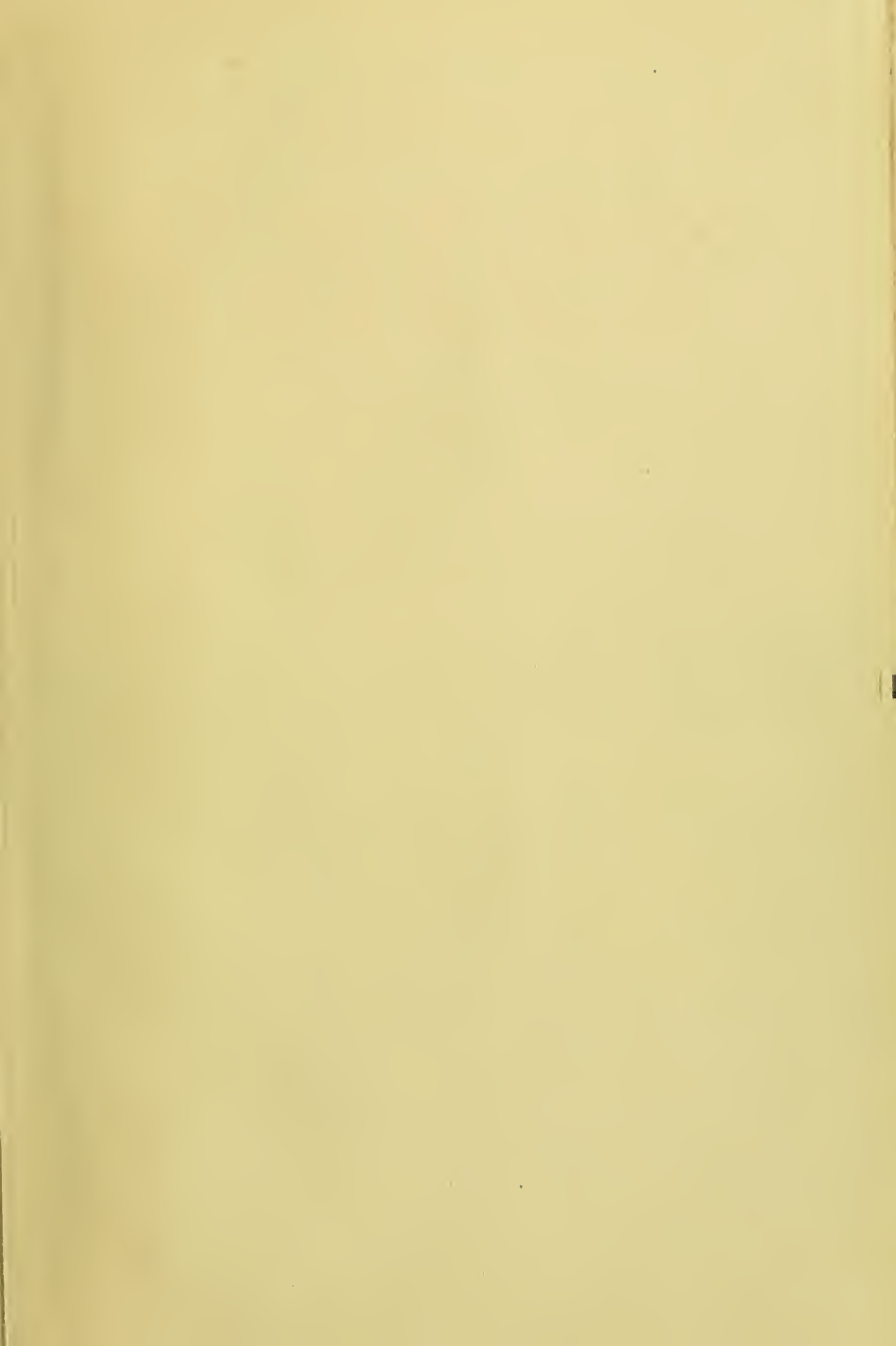
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SAN FRANCISCO Water





THE Romans knew how to cause the parted floods to measure their plain with the strong, steady, and level flight of arches from the watersheds in the hills to the arid city; and having the waters captive, they knew how to compel them to take part, by fountains, in this Roman triumph. They had the wit to boast thus of their brilliant prisoner.

None more splendid came bound to Rome, or graced captivity with a more invincible liberty of the heart. And the captivity and the leap of the heart of the waters have outlived their captors. They have remained in Rome, and have remained alone. Over them the victory was longer than empire, and their thousands of loud voices have never ceased to confess the conquest of the cold floods, separated long ago, drawn one by one, alive, to the head and front of the world.

Of such a transit is made no secret. It was the most manifest fact of Rome. You could not look to the city from the mountains or to the distance from the city without seeing the approach of those perpetual waters — waters bound upon daily tasks and minute services.

—MRS. MEYNELL.

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VOLUME IV

JANUARY, 1925

NUMBER I

Spring Valley and Hetch Hetchy

By S. P. Eastman, President

FOR a clear understanding of what has recently happened between Spring Valley and the city of San Francisco in relation to the Hetch Hetchy project, it is necessary to review certain steps taken before the program of co-operation between the city and the Company was made possible by the Railroad Commission.

In 1910 the electors of the City and County of San Francisco authorized the creation of a bonded indebtedness of \$45,000,000 to build the Hetch Hetchy water supply for San Francisco.

With the funds available vigorous construction work was undertaken, as well as the development of complete geological and engineering data for the formulation of adequate and final engineering plans for actual construction. The Raker Bill, granting to the city its rights for reservoir purposes at Hetch Hetchy and Lake Eleanor, made it mandatory that the city develop the hydro-electric power which would be, in large part, the natural by-product of the Hetch Hetchy water-supply development. This was urged by the then Secretary of the Interior on the principle that such development would proportionately reduce the use of, and thereby conserve, fuel oil in California, to which policy the Federal Government was strongly committed.

With complete engineering data available, and with the added burden of hydro-electric development as imposed by the Raker Bill, it became necessary, as well as advisable from the civic and the engineering point of view, to modify and extend the technical and physical plans for Hetch Hetchy develop-

ment. This was done, and the revised conception and plans of the project were authorized by the legislative body of the city government, the Board of Supervisors.

Both the power and the water units of the project have been under vigorous prosecution since the fall of 1914, and were carried through the War period with its attendant high costs until November, 1924, when it appeared that all of the originally authorized fund of \$45,000,000 had been expended on the works. On October 7, 1924, the electors, by a vote of approximately five to one, authorized an additional bonded indebtedness of \$10,000,000, to be available only after January 1, 1925, for the construction of additional portions of the power and water units of the project, which construction was specifically defined and limited in the authorization of the bonds. While all of the principal sum of \$45,000,000 had been exhausted, the sum of \$660,000 stood to the credit of the Hetch Hetchy Operative Fund. However, the legislative and executive branches of the city government were advised that this fund could not be devoted to the continuance of the very important work under way.

Various solutions of the dilemma were offered, and while they seemed feasible under practical consideration of the problem, they nevertheless, in the view of the City Attorney, failed to come within the legal limitations of the city's charter. The ultimate alternative appeared to be the necessity of holding a special bond election to authorize \$1,000,000 of bonds for the continuation of

(Continued on Page 16)

Calaveras Is Ready

By George A. Elliott, Chief Engineer

ALL of the construction work necessary for the development of an additional twenty-four million gallons of water daily, commenced in 1921 by Spring Valley Water Company in compliance with the order of the Railroad Commission and the agreement with the city of San Francisco, is now practically completed.

The Water Company's part in the development consisted of the construction of the Calaveras Dam to a height sufficient to supply the necessary amount of water, the building of an aqueduct from Sunol to Niles, a regulating reservoir at Niles, and a pipe-line from Niles to Irvington to connect with the Bay Division pipe of the Hetch Hetchy line now under construction by the city between Irvington and Crystal Springs Reservoir.

The completion of the dam marks the termination of an era in the history of the project which extends over a period of more than fifty years.

It was in 1875 that Calaveras Reservoir was first suggested as a source of supply for San Francisco. At that time it was advocated by an engineer named Scowden, who had

been employed by the city of San Francisco to investigate and report on the best source of water supply for the city. Considerable opposition developed and the project was dropped. Thereafter the Company began the acquisition of the reservoir lands.

In 1886 the first explorations were made to determine the best location for a dam. At various times thereafter these explorations were continued until in 1906 plans and specifications were prepared for the construction of a dam 150 feet high just below the site of the present structure.

The earthquake and fire of April, 1906, necessitated the postponement of this work, and it was not until 1913 that the actual work of building the dam was commenced.

In the meantime further explorations had indicated that the best possible dam-site of the six that had been investigated was what is known as the upper dam-site, and that the type of dam best adapted to the location was one constructed of earth. Following the commencement of construction in 1913, work has been prosecuted continuously at varying rates of speed until completion in December, 1924.



Before Calaveras Reservoir existed. The huge Spring Valley dam now spans this outlet of beautiful Calaveras Valley. This picture was taken as workmen began clearing the valley floor

FROM a battlefield where Indian braves slaughtered one another in a great and bloody conflict, to an artificial lake impounding billions of gallons of water for San Francisco—that is the history of the Calaveras Reservoir of Spring Valley Water Company.

A tradition older than California history has perpetuated the fact, but not the details, of that Indian battle. When numerous human bones were found on the old battlefield—grim relics of the ancient fight—the valley was named Calaveras, or "Skulls."

As it stands today, the dam is 215 feet high above bed-rock at the center, and contains 2,700,000 cubic yards of fill. It will store 32,780 million gallons. In other words, it has just about double the storage capacity of all of the Peninsula reservoirs. When the reservoir is full the area of the water surface is over 1400 acres.

In preparing plans for the structure, it was kept in mind that ultimately the dam will be thirty-five feet higher than its present height, and provision was made for this additional height by leaving two benches, or berms, about thirty-five feet lower than the existing crest.

To raise the dam to its ultimate height of 250 feet it will be necessary to commence work at some time when the water surface of the lake is lower than the benches and from this point continue the structure by the deposition of material in the same way that has been followed in the present construction. It will require about 300,000 cubic yards of material to do this work.

Simultaneously, a tunnel about 10,000 feet long will be driven through the ridge which separates Calaveras Reservoir from Upper Alameda Creek, and the waters of this creek will be diverted into the reservoir. When this is done, the reservoir capacity will be in the



The white streak climbing up and down the hillside outlines the contact of the dam-to-be. This is a view of Calaveras dam-site looking east, before any fill was placed

THE name "Calaveras" immediately suggests to Californians the Mother Lode country, where Mark Twain discovered the jumping frog that made him famous.

The Calaveras Reservoir of Spring Valley Water Company, an integral part of San Francisco's water-supply system, has nothing to do with Calaveras County in the Sierra foothills. It is the Coast Range Calaveras.

neighborhood of 50,000 million gallons and its daily productivity about fifty million gallons.

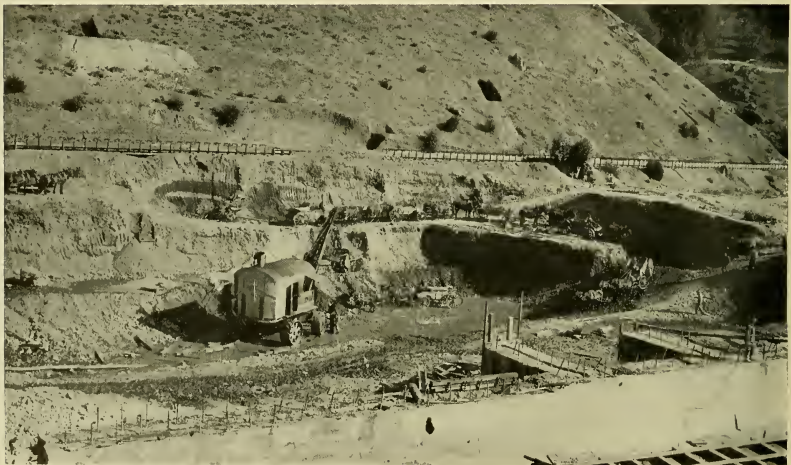
The type of construction adopted was a rolled clay core supported on both sides by loosely placed rocky material. The work of placing this material in the dam was done by Palmer & McBryde, contractors. Heavy equipment was necessary, and at times four steam-shovels were in simultaneous use, the largest of which was capable of excavating two and one-half cubic yards of earth with a single motion of the dipper. To transport the excavated material to the dam, two trains composed of four (and sometimes five) twelve-cubic-yard cars were used, as well as a large number of five-yard auto trucks.

All other work in connection with the con-

struction of the dam was handled directly by the Company forces in charge of T. W. Espy, Construction Engineer, who also supervised the work of the contractors.

The spillway, which will carry the surplus waters safely past the dam when the reservoir is full, is 1450 feet long and will carry 20,000 cubic feet of water per second. It involved the excavation of about 200,000 cubic yards and is lined with 6000 cubic yards of reinforced concrete.

The outlet works consist of a concrete-lined shaft surmounted by a tower, from which a tunnel leads to the creek channel below the dam. Water is admitted into the outlet tower from the reservoir at five different elevations, all of which are controlled by gates.



Spring Valley's Calaveras dam-site again. Here the workers are excavating to bedrock through the overburden of gravel

THE Calaveras Reservoir is an artificial lake in a beautiful region of Alameda and Santa Clara counties, midway between Niles Canyon and Mount Hamilton.

It impounds the water of a number of streams that flow down the gorges of the Coast Range in the general direction of Niles Canyon. Two of these streams, Smith and Isabel creeks, after circling Mount Hamilton, unite to form the Arroyo Hondo, which flows through Calaveras Valley.

The early rains of the present season have already been effective in starting stream-flow into the reservoir, and it is quite probable that when this is being read the water will be rising behind the dam.

The gates have been closed and everything is in readiness to utilize the full storage capacity up to the spillway.

For the first few years of its use the water, after passing through the outlet of the dam, will flow down Alameda Creek to Sunol, where it will be diverted through the subterranean infiltration galleries into the Sunol-Niles Aqueduct.

This aqueduct, as it stands today, was part of the construction necessary for the transmission of the additional water developed by the building of Calaveras Dam.

Formerly the aqueduct, which is five miles long, consisted in equal parts of concrete-lined tunnels large enough to carry seventy million gallons of water daily and a wood flume which could transport about thirty million gallons of water per day. During the summer of 1923 the wood flume was replaced with a concrete conduit with a capacity of seventy million gallons daily, so that at present the entire transmission system as far as Niles will carry not only the forty-five million gallons demanded under the terms of the arrangement with the city, but also twenty-five million gallons daily in addition, thereby providing space for future development of the Alameda sources.

At the terminus of the aqueduct near Niles a concrete-lined reservoir has just been com-



Calaveras Dam becomes a part of the landscape. There were 2,312,000 cubic yards of material in place when this view was taken in January, 1924

IN 1809 the ownership of Calaveras Valley in the Coast Range hills, midway between Niles Canyon and Mount Hamilton, was in lively dispute between the Pueblo of San Jose and the Mission of Santa Clara.

"What was the end of the dispute," says an historian, "we have been unable to discover, but it seems likeliest that La Calaveras belonged rather to the Mission San Jose."

It was a long time after that dispute that Calaveras became a part of the water supply of San Francisco. The valley, together with tributary watershed area, was acquired by Spring Valley in 1875.

It was a wise foresight, not generally appreciated at the time, that prompted Spring Valley to acquire this property.

pleted. This reservoir is of the "cut-and-fill" type, the excavated earth being used to form the banks of the basin upon which the concrete lining is laid. It has a capacity of five million gallons, with space for the construction of a duplicate unit at one end. The purpose of the reservoir is to balance the flow between the aqueduct and the pipe-line which commences at this point. Should the aqueduct carry more water than is required to fill the pipe, the surplus goes into storage in the

reservoir, and if the reverse is true, the reservoir supplies the deficiency. The Niles Reservoir was finished some time ago and is now in operation.

From Niles Reservoir to Irvington a forty-four-inch riveted pipe-line about 16,000 feet long was laid parallel to the Western Pacific Railroad.

This pipe-line connects with the pipe which is now being constructed by the city of San Francisco. It was built under a con-



Present work at Spring Valley's Calaveras Dam approaches completion. When this picture was taken, at the beginning of December, 1924, there were 2,677,000 cubic yards of material in place

THE foresight of the Company throughout its history has been rather remarkable. For example, as early as 1860, when San Francisco had only sixty thousand people, rights were acquired on the peninsula at Pilarcitos; and in 1875 lands were bought in Calaveras Valley, in Alameda County. The system has expanded, unit by unit, as the need arose."

—The Master in Chancery, *Spring Valley Water Company Rate Case.*

tract by the Western Pipe and Steel Company of California, the same firm that constructed the Bay Division pipe of the Hetch Hetchy Aqueduct between Irvington and Crystal Springs Reservoir.

The location of the line on the Western Pacific Railroad right-of-way proved to be a great aid in its construction. Ordinarily it is necessary to ship pipe of this character by railroad and then unload it and haul it to its ultimate destination on motor-trucks or wagons. In this particular case it was possible to unload the pipe directly from the cars into the trench which had been prepared to receive it. A small derrick, which was so arranged that it could move under its own power, was loaded on the last car of a train-

load of pipe. The train was moved along the railroad beside the trench and the derrick placed the pipe-lengths in the trench where they were put together. The derrick itself, as fast as it unloaded a car, would move ahead, taking a position on the car which had just been unloaded in order to remove the pipe on the next car ahead.

So far as the writer knows, this is the first time it has been possible to place pipe on cars at the point of manufacture and unload it directly into the position in which it is to be used.

As soon as the construction now under way by the city is completed, the additional water developed by Calaveras Reservoir will be used in San Francisco.



Rolled clay core of Calaveras Dam under construction. This core, which is supported by the embankments of rocky material, is now completed to a height of 215 feet

AS early as the 70's this city was considering the advisability of bringing its water supply under municipal ownership.

The rich possibilities of water development in the Calaveras Valley across the bay were realized by the city's engineers, and there was talk of the city buying that property.

Nevertheless, there were short-sighted critics who said that it was folly to go "so far away from San Francisco" for more water, and when Spring Valley, in 1875, acquired the first of its Calaveras holdings, these critics scoffed.

Today there would be no way of solving San Francisco's immediate water needs if it were not for this foresighted acquisition of the Calaveras lands.

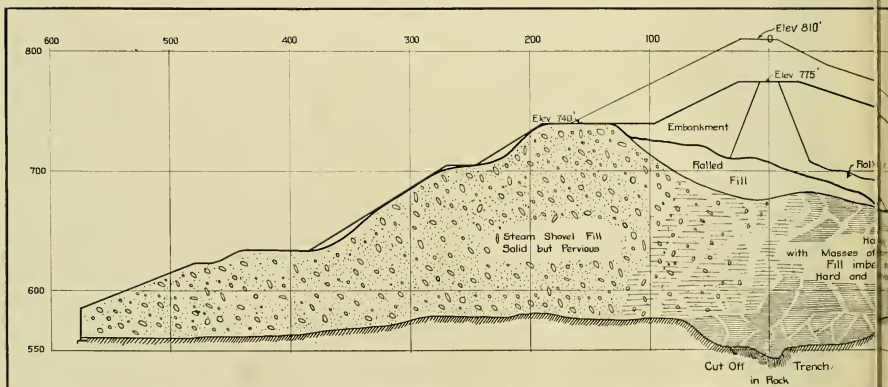
Today Calaveras, which the city talked about acquiring in the 70's, is the scene of a striking co-operation between the city of San Francisco and Spring Valley Water Company.

The agreement between the Company and the city specified that at least twenty-four million gallons daily should be developed. However, for economic reasons, all of the structures have been built to carry more than this amount of water.

The controlling factor on the delivery of the supply from Calaveras to Crystal Springs is the capacity of a pumping station which is being built near Ravenswood in San Mateo County for the purpose of pumping the water through Pulgas Tunnel into Crystal Springs Reservoir.

Originally this station was designed to pump twenty-four million gallons daily, but in view of the fact that the remainder of the transmission system had a capacity far in excess of this, it was decided to install sufficient capacity to pump thirty-two million gallons daily.

The construction of Calaveras Reservoir, together with improvements made during the last year in the Livermore Valley, which increased the productivity of the subterranean sources owned by the Company in Livermore Valley to about double their former capacity,



Cross-section of Calaveras Dam, one outline showing the dam as now completed to an elevation of 775 feet, and elevation of Calaveras Dam (775 feet), Calaveras Reservoir impounds more than thirty-two billion gallons of water. At an elevation of 810 feet, the reservoir will impound



Up-stream slope of Calaveras Dam, with Observation Hill beyond. Out of the borrow pit on this hill over two million yards of material have been taken

Calaveras in 1875

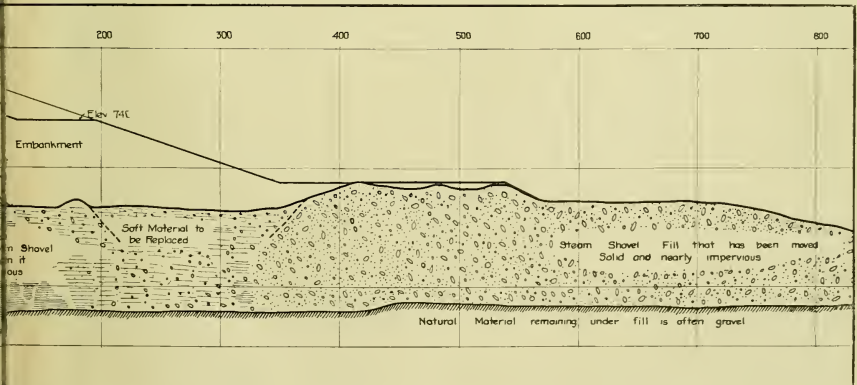
WHEN T. R. Scowden, Chief Engineer, City Water Supply, filed his report with the Board of Supervisors, April 19, 1875, recommending that the city of San Francisco acquire Calaveras Valley for a great dam and reservoir site, he stated that the acquisition of a municipal water system had engaged the attention of the Board of Supervisors for six or seven years. He was evidently of the opinion that his report recommending Calaveras as a municipal water source would settle the question, but he was in error. The city failed to acquire Calaveras, and Spring Valley came into possession of it.

The Scowden report contains some interesting material about Calaveras. The valley is described as follows:

"Calaveras Creek is the principal south fork of Alameda Creek, and takes its rise in the most elevated regions of the Mount Diablo range. Its general course is north-westerly, and its length is about 38 miles. It is proposed to collect and store the waters of the Calaveras Creek, together with the waters of its largest tributary, the Arroyo Hondo, in an immense reservoir, covering the entire Calaveras Valley, by means of a dam or embankment thrown across the narrow canyon at the outlet of the valley, and thus form a reservoir in which would be

has made it possible to insure at least thirty-two million gallons daily in addition to the twenty-one million gallons daily which has heretofore been obtained from the Alameda sources.

This means that the present developed supply of Spring Valley Water Company is seventy-four million gallons, sufficient to supply a population of over 700,000 people.



ther showing the dam when future construction will carry it to its ultimate elevation of 810 feet. At the present adding a minimum of twenty-four million gallons daily to the San Francisco supply. At its final elevation fifty-one billion gallons of water



The spillway of Calaveras Dam is now completed. It had reached the above stage of construction in September, 1924. The top of the dam is seen on the skyline



Calaveras Dam of Spring Valley Water Company carried to a height of 215 feet above its foundation. This view, like that on the cover of *SAN FRANCISCO WATER*, shows the berm construction of the down-stream slope

water stored with head and force sufficient to flow by gravitation to the distributing reservoir in the city of San Francisco.

"The Calaveras reservoir would be tapped at its westerly side by means of an outlet tunnel, perforating the hills lying between the Calaveras Valley and San Jose Valley; the water drawn thence would flow in a wrought-iron conduit 60 inches diameter, and 45.58 miles in length to the Rock Creek or main distributing reservoir in San Francisco.

"The area of the watershed of Calaveras Creek above the point selected for the embankment, is 101.28 square miles; of the Arroyo Hondo, 38.20 square miles; total watershed, 139.48 square miles, of which 16.79 square miles are situated in Alameda County, and 122.69 square miles in Santa Clara County. With the exception of Cala-

veras Valley the country is extremely precipitous, unfit for cultivation, and covered for the greater part with dense masses of chamisal, interspersed with forests of pine and oak. The hills bordering the San Jose Valley directly east, consist of sandstone only slightly metamorphic and contain numerous fossils, mostly in a bad state of preservation, sufficient, however, to fix the age as tertiary. Passing easterly after crossing the valley at its easterly base, there is a region of highly metamorphic rock, which in places might be termed slate. On the easterly side of this is a deep valley (the site for reservoir), and crossing this one strikes Calaveras Creek and ridge, which leads to the summit of Mt. Hamilton, located centrally within the Calaveras watershed, in a direction nearly transverse to the main chain, or northeast and southwest. This ridge is of metamorphic



Spring Valley's Sunol Aqueduct, with a capacity of seventy million gallons daily, will carry Calaveras water down beautiful Niles Canyon. In this span, art goes hand in hand with engineering, and the nobility of the landscape suffers no hurt



Spring Valley's Niles-to-Irvington forty-four-inch pipe-line will carry Calaveras water to the Irvington inlet of the Hetch-Hetchy Conduit, through which the water will flow to Crystal Springs Reservoir in San Mateo County. The pipe on the car has since been laid

sandstone, although not so highly altered as are portions of the great mountain mass to the east, and the strata are much broken and often standing nearly vertical.

"Mount Hamilton, the highest point of the group, and the highest peak north of San Carlos extending as far as Clear Lake, is 4448 feet above the level of the sea. From its summit, which is of easy access, there is a fine view, not only of the beautiful and

fertile valley of San Jose, but of the wild and entirely uninhabited and unknown region to the east, northeast, and southeast of the Calaveras and Arroyo Hondo."

Engineer Scowden, in making mention of Mt. Hamilton in the paragraph above, adds this note:

"This mountain has been selected for the site of the Lick Observatory."

Engineer Scowden had this to say about the water productivity of Calaveras Valley:

"The total annual amount of water falling on the watershed above described, namely on an area of 139.48 square miles, equals 58,175,666,600 gallons. As in other cases, take one-half as the percentage of utilization,

(Continued on Page 16)



Laying pipe for Spring Valley's Niles-to-Irvington Line. By using the caterpillar crane, the two operations of unloading cars and placing pipe in trench are combined in one



Spring Valley's Niles Reservoir, completed and roofed over, will receive Calaveras water at the outlet of the Sunol Aqueduct

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EDWARD F. O'DAY, *Editor*

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No. 1

INFINITE cost hath been bestowed in Rome of old, Constantinople, Carthage, Alexandria, and such populous cities, to convey good and wholesome waters."

This quotation, on the back cover of our last issue, was credited to Robert Burton. Who was Robert Burton? The answer is that he was one of the quaintest and most eccentric writers that England ever produced. He was born 1577 and died 1640, and the book by which he is known to all students of English literature is called "The Anatomy of Melancholy." It is one of the strangest books ever written, full of queer stories gathered in out-of-the-way places, and crammed with quotations from Latin writers that only a handful of scholars ever heard of.

Cursed himself with a melancholy disposition, Burton resolved to help others afflicted in the same way; so he made a study of melancholy, its causes and its cures. All medical theories and practices, ancient and of his own day, seemed equally important to Burton. He took them all seriously, and the result is a hodgepodge that the medical scientists of today would find most amazing if they read Burton's book. But it is only read by a few delvers into the "curiosities of literature."

Burton regards impure water as one of the causes of melancholy. Here is a passage that shows how Burton handles his subject:

"Standing waters, thick and ill-coloured; such as come forth of pools, and moats, where hemp hath been steeped, or slimy fishes live, are most unwholesome, putrefied, and full of mites, creepers, slimy, muddy, unclean, corrupt, impure, by reason of the sun's heat, and still-standing; they cause foul distemperatures in the body and mind of man, are unfit to make drink of, to dress meat with, or to be used about men inwardly

or outwardly. They are good for many domestic uses, to wash horses, water cattle, etc., or in time of necessity, but not otherwise."

"Some are of the opinion," Burton continues, "that such fat standing waters make the best beer," but this he denies with vigor, quoting learned authorities in support of his position. He tells of a stream in Thessaly that "turns cattle most part white," and of another stream in Macedonia that "makes all cattle black that taste it." He informs us that "the stuttering of some families in Aquitania" is caused by the drinking of impure water. This is how he sums up the evidence:

"They that use filthy, standing, ill-coloured, thick, muddy water, must needs have muddy, ill-coloured, impure, and infirm bodies. And because the body works upon the mind, they shall have grosser understandings, dull, foggy, melancholy spirits, and be really subject to all manner of infirmities."

And now for the constructive side of the matter: "Pure, thin, light water by all means use, of good smell and taste, like to the air in sight, such as is soon hot, soon cold, and which Hippocrates so much approves, if at least it may be had. Rain water is purest, so that it fall not down in great drops, and be used forthwith, for it quickly putrefies. Next to it, fountain water that riseth in the east, and runneth eastward, from a quick running spring, from flinty, chalky, gravelly grounds; and the longer a river runneth, it is commonly the purest, though many springs do yield the best water at their fountains."

Burton was broad-minded and willing to give credit where credit was due, as this statement shows: "The waters in hotter countries, as in Turkey, Persia, India, within the tropics, are frequently purer than ours in the north, more subtle, thin, and lighter, as our merchants observe, by four ounces in a pound, pleasanter to drink, as good as our beer, and some of them, as Choaspis in Persia, preferred by the Persian kings before wine itself."

Few physicians can heal themselves. Although Robert Burton wrote a big book about the cure of melancholy, his own distemper continued through life. It is related of him that nothing would make him laugh except the bad language which the bargemen on the River Thames exchanged.

Spring Valley on the Waterfront

By M. C. Gorgas, Publicity Department

"AVAST there! Hard down your hullum!" The salty words rang a ship's bell in my absent mind. I was crossing the Embarcadero and wool-gathering, two things that should not be attempted at one and the same time.

I brought up all standing, and took a new set of bearings.

In trying to steer a straight course across the Embarcadero, I had almost stepped into the excavation for the subway. Hoisting the "Thank you" flag for my Good Samaritan, I tacked and headed nor'-nor'east, and finally hove to at Spring Valley's waterfront office.

"Ship ahoy!" I cried, rapping on the door.

"Hello" would have been the correct nautical reply, but the response came from an alert business man, and it was:

"What can I do for you?"

"Are visitors allowed on board?" I asked.

"Step right in and make yourself at home," was the courteous return.

I found myself in a spick-and-span office not much larger than a captain's cabin aboard a whaler.

"Is Mr. Henry Templeman aboard ship?" I inquired.

"I am Mr. Templeman."

"Tip us your flipper," I said, and Spring Valley's Manager of Docks and Shipping extended a cordial hand. We hooked grappling-irons, and I furled sail and came to anchor on a comfortable chair.

For fifty years Henry Templeman has known the wonderful waterfront of San Francisco. Fifty years ago the bay was crowded with windjammers loading grain for Liverpool and Leith, Havre and Marseilles and Bordeaux. Today a windjammer in the bay is an object of special curiosity. Fifty years ago the crimp was a familiar figure, and unfortunate derelicts of the Barbary Coast were shanghaied to all ports of the Seven Seas. Today all that is changed. The Barbary Coast is gone, and the shipmaster worries now about stowaways. Fifty years ago almost the only steamers in the bay were Pacific Mail liners. Today you may see two hundred and fifty steamers in the bay at one time. Fifty years ago the iron-

clad Monitor "Comanche" represented the navy of the United States in these waters, with an occasional wooden-sided sloop-of-war. Today the battleships, destroyers, and submarines of the Pacific Fleet are a familiar sight. Fifty years ago a horse and wagon hauled the overland mail from the Embarcadero to the Postoffice at Battery and Washington streets. Today airplanes from Reno, the last transcontinental relay, land it at Crissy Field.

All the marvelous changes of fifty years Henry Templeman has seen at close range. None on the harbor side has seen more of these changes than he, for he is the Dean of Waterfront Business Men.

All the water used by ocean-going steamers, coastwise vessels, ferry-boats, bay and river craft, is supplied by Spring Valley's Manager of Docks and Shipping. It is a big business, amounting to about 365,000,000 gallons a year.

"What's your cruising-ground down here?" I asked Mr. Templeman.

"Eight miles," he answered. "From the foot of Buchanan Street to Hunters Point Dry Dock."

"Do you find everything shipshape and easy-going with the people you run foul of?"

"A certain amount of diplomacy is needed now and then," he replied with a smile.

"Oh, you sometimes get jammed between the mate and the engineer?"

"Well," answered Mr. Templeman conservatively, "it is true that they don't always agree about the amount of water taken on. But such little disputes always settle themselves."

"With the aid of a belaying-pin?"

"Fortunately, that argument is not used between mates and engineers."

"When you go aboard ship do you sometimes have an opportunity to splice the main brace?"

"My dear sir," said Mr. Templeman in a tone of wonder, "have you forgotten that we are here well within the three-mile limit?"

Realizing that I had headed into trouble, I went about and stood away from this dangerous subject.

"I notice that Spring Valley has placed

drinking-fountains on all the piers. Are they well patronized?"

"Yes," said Mr. Templeman, "and they have effected a great saving of water. Thirsty longshoremen used to have a way of opening a hydrant and wasting a barrel of water just to get a drink."

Mr. Templeman, who had been glancing through his mail—for he is a very busy man, and has not much time for interviewers—handed me a letter.

"Do you want me to cast my deadlights over this?" I asked, and Mr. Templeman nodded. It was a letter from the Assistant General Superintendent of the Army Transport Service, and read as follows:

"I desire to express our appreciation of your prompt action in assisting us to obtain a temporary supply of water to Fort McDowell and Alcatraz."

"At eleven o'clock a few mornings ago," Mr. Templeman explained, "the Army Transport Service at Fort Mason rang up and asked how soon we could furnish two of their water-boats for Fort McDowell and Alcatraz, both entirely out of water on account of a break. We always answer 'Now' to such queries. By two o'clock that same afternoon 380,000 gallons had been delivered to Fort McDowell and Alcatraz. That's enough water to supply 125 families for a month."

"You deliver in pretty large quantities."

"Liners," said Mr. Templeman, "usually reserve from twenty-five to thirty per cent of

their deadweight capacity for water alone. A ten-thousand-ton ship will take from this port 2500 or 3000 tons of water in her tanks and hold."

"What was your record delivery?"

"To the Mount Vernon. She steamed out of the Golden Gate with 1,700,000 gallons (7500 tons) of Spring Valley water."

Seventy-five hundred tons of water! The magnitude of this swell tore me from my mental moorings and left me pounding heavily on the beach. When I clawed off into deep water again, Mr. Templeman was introducing me to his crew.

Still weak and waterlogged, I asked one who looked like the bosun's mate how he liked his boarding duties.

"It's a bit tough sometimes," he replied with a Hibernian grin and intonation, "to go aboard ship and have to admit that I'm selling nothing but chasers."

"A chaser," Mr. Templeman explained for my benefit, "is a bit of slang long since outlawed by the Eighteenth Amendment. It referred in the distant past to the modest draught of Spring Valley that was used to wash down a more potent potation."

"Sure the captain knows what a chaser is," Mr. Templeman's assistant put in; "they used them occasionally on the 'Thetis,' God bless her memory!"

"Righto!" I exclaimed, and from then on the ship of conversation passed from Spring Valley to salt water.

Opportunity for Reminiscence

Oakland Tribune, Dec. 19, 1924

THE people on this side of the bay are glad that San Francisco will now be able to continue to completion the large Hetch Hetchy undertaking. Water is as great a necessity on that side as it is on this, and the controversies which have hindered and threatened to halt the work are regarded as unfortunate. As Californians and neighbors, the Eastbay is glad to see them settled.

In the light of history, it seems at least a little incongruous that at the most critical period in the Hetch Hetchy work, and when

the money was not available, the much-maligned Spring Valley Water Company came to the front to furnish the funds to complete the job. Volumes might be written on the subject, but suffice to say the company is to be commended and regardless of the fact that among those who berated it and made it a target are some of those who are most prominent in Hetch Hetchy circles. At least, the situation affords opportunity for reminiscence.

Spring Valley and Hetch Hetchy

(Continued from Page 1)

this work. Such a bond issue would cost at least \$35,000, and would entail a delay of six months or more, and thereby a cessation of work involving a payroll of five hundred trained men engaged in work imperatively necessary of completion.

As the order of the Railroad Commission of August 12, 1921, and the agreement between the Company and the city of April 17, 1922, contemplated the development of the Spring Valley system until purchased by the city and the ultimate acquisition by the city of the works of the Spring Valley Company, all for consolidation with the Hetch Hetchy system as the ultimate water supply for the city, the Company, when appealed to by the city's representative, felt that it should lend all co-operation possible to the city in the solution of its financial problem. As the only alternative involved the losses

to the city incident to a special bond issue for \$1,000,000, the Water Company was asked to advance four annual payments of \$250,000 which would accrue, under the agreement between the city and the Company, annually hereafter as rentals for the use of the Bay Division of the city's Hetch Hetchy Aqueduct. Further, the Company to borrow or obtain the necessary funds at the lowest rates of interest obtainable; the city in turn to compensate the Company for such interest costs in such a way that the Company would neither profit nor sustain any loss in interest by the transaction. Although the Company was in a position by which it was required to borrow money to carry on its own construction works, it agreed with the city under the difficult circumstances to advance \$1,000,000 so that the Hetch Hetchy work could be prosecuted continuously without the loss of trained forces and the other losses incident to failure to carry on continuously those parts of the Hetch Hetchy work so essential at this time.

* * *

Calaveras in 1875

(Continued from Page 12)

that is, 29,087,833,300 gallons, which gives an available daily supply of 79,692,690 gallons, leaving a surplus of nearly 30,000,000 gallons per day more than sufficient to supply 100 gallons to each inhabitant for a population of 500,000, which surplus may be used to supply San Jose, Milpitas, and all the towns along the line of the conduit from Calaveras Valley to the city of San Francisco."

A map of Calaveras Valley accompanying the Scowden report gives the names of those living in the valley at that time.

On the Santa Clara County side of the boundary line there were: S. Sherman, J. T. Sherman, Harris, D. Campbell, Wells, Pomeroy, Gaines, Martin. A schoolhouse is noted near the road from Milpitas.

And on the Alameda County side: Hayden, Ellis, Harris.

Choosing Collectors

"A LARGE water company in California takes special care in selecting men to fill positions as collectors, choosing men who have had considerable service with the Company, who have proven themselves tactful and capable, and who understand the policies of the Company. This care is justified because the collectors are the only persons in the Company with whom the great majority of the public comes in contact. To the average water-user the collector is the Water Company."

* * *

IN forwarding to the Manager of the Water Sales Department of Spring Valley a marked copy of the *Southern Pacific Bulletin* for December, 1924, containing the above item, the Associate Editor of the Southern Pacific Bureau of News writes: "You probably will have no difficulty in discovering what water company is referred to here."

SPRING VALLEY WATER COMPANY

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	F. B. ANDERSON		BENJAMIN BANGS
W. B. BOURN	S. P. EASTMAN	E. L. EYRE	E. S. HELLER
	C. OSGOOD HOOKER	FRANK B. KING	E. J. MCCUTCHEN
L. F. MONTEAGLE	WARREN OLNEY, JR.	A. H. PAYSON	ARTHUR R. VINCENT

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		CHIEF, COLLECTION	C. I. Gavin
		MANAGER, DOCKS AND SHIPPING	H. Templeman
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ASSISTANT SUPERINTENDENT	A. W. Ebright		
HYDROGRAPHER	S. M. Millard	PURCHASING AGENT	J. H. Le Pla



HERE IS A FOUNTAIN
BY JERICHO THAT RUNS
PLENTIFULLY, AND IS
VERY FIT FOR WATER-
ING THE GROUND; IT
ARISES NEAR THE OLD
CITY WHICH JOSHUA, THE GENERAL OF
THE HEBREWS, TOOK FIRST OF ALL THE
CITIES OF THE LAND OF CANAAN BY
RIGHT OF WAR. THE REPORT IS THAT
THIS FOUNTAIN AT THE BEGINNING
CAUSED NOT ONLY THE BLASTING OF
THE EARTH AND THE TREES, BUT OF THE
CHILDREN BORN OF WOMEN, BUT THAT
IT WAS MADE GENTLE AND VERY
WHOLESOME AND FRUITFUL BY THE
PROPHET ELISHA. — JOSEPHUS.

SAN FRANCISCO Water

April 125





THIS town has twice been laid in ashes; but the young phoenix has risen on ampler wings than those that steadied the consumed form of its parent. It must be the great commercial emporium of California in spite of competition, wind and flames. Its direct communication with the sea, its magnificent bay and internal communications, have settled the question of its ultimate grandeur. Three years ago only a dozen shanties sprinkled its sand-hills; now, even with its heart burnt out, it looks like the skeleton of a huge city. That heart will be reconstructed, and send the life-blood leaping through the system.

THREE YEARS IN CALIFORNIA
BY REV. WALTER COLTON
[1850]

SAN FRANCISCO WATER

PUBLISHED BY

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VOLUME IV

APRIL, 1925

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The Fire Department and Spring Valley

By Thomas R. Murphy, Chief Engineer, San Francisco Fire Department

SELF-PRESERVATION, and the preservation of its created resources, are among humanity's strongest instincts; and on the other hand, fire, if uncontrolled, is one of humanity's most unrelenting enemies.

For the purpose of combating fire, modern science and human ingenuity have combined to devise intricate and powerful apparatus, the mobility and endurance of which are a marvel even to those of us who have had the opportunity to closely observe the gradual development of this modern fire-fighting machinery. Organizations of trained men have been established in practically every civilized community on the earth, and huge sums of money are being spent upon their maintenance. But in spite of all this remarkable advancement, in spite of the technical perfection and the generous appropriations for the modern fire departments, they, just like the more primitive fire-fighters

of the past, must entirely rely upon a plentiful and dependable supply of water. The best-organized fire department, equipped with the most modern types of apparatus,

would become like an unarmed mob, were it compelled to face a conflagration without an adequate water supply in back of it.

Is it any wonder, then, that we who are charged with the protection of your lives, your homes, and your industries from fire, are gravely concerned with the proper maintenance of an ample and reliable water supply, and are eager to co-operate in any effort to insure its proper maintenance and to work toward expansion and improvement?

Fifteen years as Chief Engineer of the San Francisco Fire Department have given me an excellent opportunity to correctly analyze the degree of co-operation existing between Spring Valley Water Company, which is maintaining practically the entire water supply of the city, and the Fire Department, in so far as fire protection is concerned. I feel secure in the knowledge that the officials as well as the personnel of the Water Com-

pany, privately owned and operated as that Company is, and notwithstanding decisions by courts and commissions that domestic water supplies are subject only to compul-



Chief Murphy

sory measures, are sincerely concerned with the situation from a fire-protection viewpoint, and are always ready to lend their support to all just recommendations and requests coming from the Fire Department.

While by the foregoing I do not wish to create the impression that in my judgment, and from a fire-protection viewpoint, the water system maintained by the Company is all that could be desired, I cannot but acknowledge the genuine desire on the part of the Company to co-operate with the Fire Department wherever possible, to the end that proper fire protection may be had in every section of the city where service mains are being maintained.

This recognition of a public duty becomes evident in many ways. The Water Company dispatches its gatemen to the seat of every large fire, in order to make sure that a sufficient supply of water is delivered through the mains. Whenever conditions arise which require the shutting off of mains in any section where fire-hydrants are installed, the Fire Department is notified, so that it may

establish other protective measures pending the restoration of normal conditions. Plans of proposed main extensions are always made with serious thought for the fire-protection needs of the various districts, and recommendations coming from the Chief of the Fire Department receive thorough consideration.

To cite a very recent occurrence typical of the spirit that prevails in all dealings between the Water Company and the Fire Department: At Nineteenth and Howard streets, by order of the Board of Fire Commissioners, an old-style hydrant had to be replaced. The department has an arrangement of long-standing, paying a flat rate for the work of installing fire-hydrants, and also removing the old-style hydrants when necessary. This rate, originally designed to barely cover the cost of the necessary work, has never been raised. Despite increased cost of materials and labor, it remains at the old figure—namely, \$40 for an installation, and \$22.50 for a removal, including the complete restoration of street and sidewalk pavements.



"The Chief is very cool at a fire," testifies Spring Valley Gateman Mike Griffin



In this high-pressure test the streams were thrown four times as high as Lotta's Fountain

It developed that between the time of the original installation of this hydrant and the time of its replacement a new main of twenty-four-inch diameter had been laid on Howard Street, and to take advantage of this large main for fire protection the Company was asked to plug the old six-inch main to which the old hydrant had been connected, and to install the new hydrant on the twenty-four-inch main.

This request was cheerfully complied with. A large force of men moved on the ground, and, from the appearance of the trenching and materials required for this job, it is safe to surmise that the transaction, from a cost point of view, was not very profitable to the Water Company. But the public interest had been served, and everybody was pleased. I cite this merely as one of many examples still fresh in my memory, and all plainly demonstrating the existence of this mutual good-will.

Following the earthquake and fire in 1906, the city voted a five-million-dollar bond issue, and with this money installed a

high-pressure water system for fire-protection purposes. This system has now been sufficiently long in service for us to pronounce it a complete success in every respect. Somehow the impression grew in various quarters that this system does, or should, displace the Spring Valley Water system as a source of fire protection, but this is very far from the truth. This high-pressure system is just exactly what it was intended to be—namely, an auxiliary fire-protection system, or a system that is meant to augment and reinforce the old system, but by no means to displace it.

The reasons for this are—first, this system covers a comparatively small area of the city; and second, even within this covered area, there are large gaps without high-pressure mains and hydrants. At no time did the designers and proponents of this high-pressure system intend to displace the fire-hydrants of the Spring Valley system, not even in the down-town section, which is well provided with the larger hydrants connected to high-pressure mains. They merely intended to augment it with an additional safeguard by the installation of this auxiliary system which, for emergency purposes, draws its main supply and has its main storage



A concentration of high-pressure lines demonstrated on New Montgomery Street

reservoirs right in the city, so that, in the event of another earthquake, emergency repairs can be made with the least possible delay. This system is particularly noted for the great number of line-gates which in case of need permit the shutting down of very small sections, and thereby isolating a possible break in the mains without endangering a large territory. Excepting during emergency conditions, such as large fires, or, as is the case at present, during periods of drought affecting the city's entire domestic supply of water, the high-pressure system

is filled with fresh water supplied by Spring Valley Water Company, in order to lengthen its period of reliability, which would be unduly shortened by corrosive action of salt water if the latter were used continually.

The above will show the close relationship of Spring Valley Water Company to the fire protection of our city, and the grave necessity for harmonious collaboration of that Company with the city Fire Department. Fortunately, existing relations are of the best, and it is my sincere hope that they will thus continue.

Water for Fire Protection

By George W. Pracy, Superintendent, City Distribution

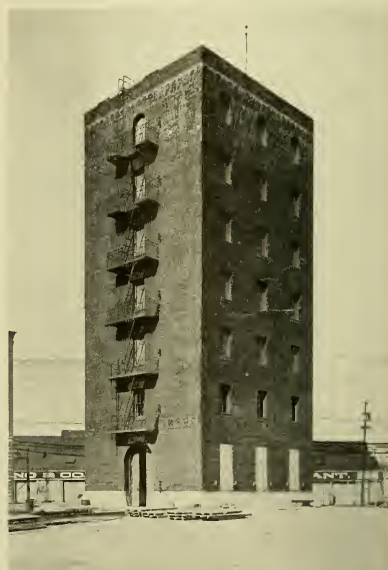
FIRES have a dreadful attraction for all of us. We cannot help but admire the speed and efficiency shown by the firemen as they couple up their hose and attack the flames. We stand fascinated as the streams of water attack the burning building with terrific force. We are thrilled when the firemen take these streams inside the blazing structure, heedless of the dangers that await them there.

This part of the work is as necessary as it is exciting and dangerous, but back of it all is the essential but prosaic fact that Spring Valley Water Company must stand ready at any moment of the day or night to deliver the water that is all-important in the work of fighting fires.

It is not enough that Spring Valley must furnish forty million gallons of water every day for ordinary uses, sufficient to flood Union Square to a depth of fifty feet. The Company must also stand ready to supply water to all the fire apparatus that can be concentrated at a fire. This use may be as high as one million gallons per hour, all supplied to as small a space as a city block.

The use of such quantities in small areas makes much larger distributing mains necessary than would be required for domestic consumption only. In some of the rapidly growing outlying districts the domestic supply is taken care of without complaint through two-inch pipe. The mains, however, are inadequate for supplying a fire-engine,

and will have to be replaced as soon as possible with six- or eight-inch pipe. A typical block in the Sunset District, solidly built upon, containing forty-eight houses, will draw water at a rate not to exceed two hun-



This beautiful structure, at Eleventh and Bryant streets, San Francisco, is the Drill Tower of the Fire Department



Testing the "throw" from the stand-pipes of the Standard Oil Building. The streams are topping the roof of the al-fresco garden, which is twenty-two stories—more than three hundred feet—above the sidewalk

dred gallons per minute. A fire there which called out only one engine would use one thousand gallons a minute, or five times the domestic rate.

Mains are laid in the residential districts so that hydrants can be set at all street intersections. In the congested districts they are set together, and are reinforced with hydrants on the auxiliary high-pressure system.

All water systems are inspected by the National Board of Fire Underwriters, which subjects every part of the supply and distribution system to a rigid examination. This examination covers the size and dependability of the supply lines, the size of the mains, both feeder and distributing, the gates by which sections are shut down for repairs, the location and number of hydrants, the amount of water obtainable from a hydrant, the general care of the system, and, in fact, everything that helps to make the water supply adequate and dependable at all times. The desire to get a favorable report naturally adds a zest to the work of maintaining the system.

In some cities the water necessary to put out fires is obtained by starting additional pumps after the fire-alarm sounds. In San Francisco the reserve supply is carried in large storage reservoirs within the city, and is instantly available. Even though all the Spring Valley pumping facilities were incapacitated, there would still be enough water to supply the city in every respect for three days.

The Spring Valley Gateman

By the Editor

CLANG! Clang-clang-clang! Clang! The brazen tapper above the telephone switchboard in the Spring Valley Building beats out its strident message. Fire!—and this is the second alarm! The man at the switchboard jumps up, and almost before a substitute has adjusted the head-phone he is speeding away to the fire. The Spring Valley gateman is doing his important part in fire-fighting.

Arrived at the scene of the blaze, the gateman reports to Fire Chief Murphy—you will always find the Fire Chief at a second-alarm fire.

"Evening, Chief."

"Hello, Mike."

With that interchange, the Spring Valley gateman becomes subject to the strict discipline of fire-fighting. He must obey orders as swiftly and as implicitly as any fireman

on the job. He must go where the Chief tells him to go, do as the Chief directs, and stay until the Chief gives him his release. Up to this point he has been liaison-man between the Water Company and the city. Now, and until the Chief needs his help no longer, he is working for the Fire Department.



To protect its long waterfront San Francisco has two fireboats, the "David Scannell" and the "Dennis T. Sullivan," named for beloved fire chiefs of other days

NOTICE.

At a Special Meeting of the Town Council, to take into consideration the necessity of making immediate arrangements for the protection and assistance of the sufferers by the conflagration of this morning, Present---Messrs. Stuart, Price, Ellis, Harris, Green, Brannan, Turk, Davis, Simmons and Harrison. Hon. JNO. W. GEARY, presiding.

On motion of Mr. Price,

Resolved, That on account of the disastrous fire which occurred this morning, and the large amount of property now exposed to depredation, the Alcalde be authorised to empower the Chief of Police to employ a sufficient number of persons to guard the burnt district, so as to render full protection to the property of the sufferers, and to retain them as long as necessary for that purpose. The persons so employed shall be under the immediate direction of the Chief of Police, and be paid such compensation as shall be approved by the Alcalde.

On motion of Mr. Brannan,

Resolved, That the President of the Council of San Francisco is hereby instructed to solicit the assistance of the Navy, through the commanding officer of the same, to station a guard in front of the Town, with boats during the night, to prevent property from being taken on board of vessels unlawfully.

On motion of Mr. Price,

Resolved, That the sufferers by the disastrous Fire of this morning, be requested to register at the Alcalde's office the amount of their loss, at as early a period as practicable, so that any contributions that may be made for their relief may be equally distributed.

On motion of Mr. Price,

Whereas, the Town severely suffered this morning, from the want of necessary organisation and means to meet the devastating element of Fire.

Therefore, **Resolved,** That the citizens be requested to meet in Portsmouth Square, on Wednesday next, at 12 o'clock M., to take such measures as may be deemed advisable to protect the Town against another such calamity, by organising Fire Companies, and that the Town Council will supply the Hooks, Ladders, Axes, Ropes, &c. to be kept by said Companies.

On motion of Mr. Stuart,

Resolved, That the Alcalde be authorised to send to the Hospital, or provide in the most ready and suitable manner to afford immediate aid with proper medical attendance, to those individuals, who, in their praiseworthy exertions during the recent Fire, have received any bodily injury.

On motion,

Resolved, That the proceedings of this meeting be published in the papers of this city.

H. L. DODGE, Secretary.

San Francisco, Dec. 24, 1849.

"Got lots of water, Chief?"

"No, Mike."

"We'll throw in College Hill to strengthen you up."

"Good! Take two men and go to it."

We are supposing that this particular fire is a night fire south of Market Street in the district supplied by the University Mound distributing reservoir. University Mound Reservoir is at elevation 163 feet. It's a bad fire. Tons of water are beginning to empty upon it from a dozen nozzles. The pressure can't stand up. College Hill distributing reservoir is at elevation 253 feet. No question about it, College Hill water will "strengthen 'er up."

The city is zoned for water service and fire protection. Streets in different zones are separated by closed gates. To throw in the pressure from a higher elevation, the proper gates must be opened. No need for the gateman to consult his book for the whereabouts of the gates. He knows them by heart. Accompanied by the firemen the Chief assigned to him, he speeds along the "divide"—let us say on the south side of Market Street—and throws in College Hill to strengthen University Mound by opening four, five, six gates—his experience tells him how many are needed. With each turn of the gate-wrench College Hill water leaps forward from its higher elevation to reinforce the streams from the lower level of University Mound. Then the gateman reports back to the Chief.

If he is not needed immediately, he goes and takes his stand with the Chief's operator, who is stationed at the nearest fire-alarm box. Matters would be complicated if another fire happened to start in the College Hill district, which is feeding its water into the zone of lower pressure. No possibility can be overlooked in fire-fighting. Every emergency must be foreseen. No matter what the fire, the Chief fights it with his mind carrying the thought of protection for all the rest of the city. The Spring Valley gateman and the operator, on watch at the box, are his outposts, sentrymen ready to warn him that the fire-enemy has made his appearance elsewhere.

When the fire is over the gates have to be closed. Then the gateman reports to the Chief once more.

"It's all right now. Good night, Mike."

"Good night, Tom."

You see, the gateman is back in the service of the Water Company, and he and Tom Murphy are old friends. They've known each other—and have valued each other—for thirty-two years.

Thirty-two years ago this month, Mike Griffin entered the employ of Spring Valley Water Company as helper to Pat Mee, the Company's veteran gateman of that generation. A great old gateman was Pat Mee! He didn't believe in pampering a helper who stood six feet in his stockings, with the broad shoulders and muscled arms of that blue-eyed, curly-haired Irish young-manhood that, somehow or other, seemed to be more plentiful in San Francisco thirty-two years ago than it is now. Pat Mee made Mike Griffin work hard, and when Mike wasn't otherwise busy Pat made him memorize the streets of San Francisco—all the streets from the Embarcadero (it was East Street in those days) to the Pacific Ocean and from the north side clear down to the county line. There weren't as many streets then as there are today, for large tracts of land now developed as choice residential sections were sandhills in '93. But there were plenty of streets even then, and it was a hard job to memorize them all in their proper order.

"Pat Mee wasn't satisfied," says Mike Griffin, "until I had every one of them on the top of my tongue, just like the alphabet."

Mike Griffin is selected for mention here because he is the dean of Spring Valley gatemen, but it goes without saying that the other gatemen have been through the same hard training. Ask Mike or any of the others to give you the streets in a certain section of San Francisco, and you'll hear a list rattled off without pause or stumble that is bound to include many names you never heard before. A street is a street with the Spring Valley gateman, and they know them all, no matter whether broad thoroughfare, narrow alley, or cul-de-sac.

And they all know the underground geography of the city. What is under the streets is no mystery to them. They visualize sharply the mysteries that the rest of us only glimpse once in a while when we stop to peer into an excavation. If they know one thing a little better than all the rest, it is the location of all the gates. The gates, of course, are all plotted in Spring Valley records, but no more accurately than they are fixed in the



The fire-fighting progress of seventy-five years. David C. Broderick led Empire No. 1 Company, and after his death it took his name. The engine was housed on Sacramento Street. Today the city has forty-eight engine companies, fourteen truck companies, and thirteen chemicals. This is Engine No. 12. at 115 Drumm Street

minds of the gatemen. Sometimes, in resurfacing a street, the contractor will run his bitumen over a gate-cover, hiding it from view. Is that any obstacle in the work of the gateman?

"We know where to look," says Mike Griffin.

Looking back over thirty-two years of keeping the gates, Mike Griffin sees vividly his first big fire. It burned everything that stood between Fourth and Fifth, Bryant and Brannan streets, principally lumber yards, small homes, and tenement houses.

"After that bad fire," says Mike Griffin, "we reinforced the old system with a twelve-inch main down Fourth Street from Market to Berry, a sixteen-inch main on Brannan from Third to Ninth, and a twelve-inch main on Bryant from Fourth to Eighth."

There was no looking in the records for those figures; Mike Griffin carries them in his head, and, like the street names, "on the top of his tongue."

There are five Spring Valley gatemen, three of whom work on the day shift, one on the night shift, and the fifth on the "graveyard." Hours are changed every two weeks. Mike Griffin explains the schedule. It sounds complicated, but it is efficient. Suffice to say here that two men work from eight A.M. to five P.M.; one man from eight A.M. to four P.M.; one man from four P.M. to midnight; and one man on the "graveyard shift"—that is to say, from midnight to eight in the morning.

Of course, gatemen have to do with gates even when there are no fires. If there is a piece of pipe to be replaced or a leak to be repaired, the gates must be shut down so that the section where the work is under way can be temporarily isolated. When the street gang is ready for the shutdown, the gateman arrives on the scene. If a section of pipe is being replaced, the gateman waits until the pipe is "bleeding" before he closes the gate.

(Continued on page 16)

The Forest Service Conference

By Wallace I. Hutchinson, U. S. Forest Service

ONE hundred and seventy-five officers of the California District, United States Forest Service, the largest gathering of Forest Service officers ever held in the United States, recently completed a ten-days conference at Fort Miley, San Francisco. This was the first general meeting of Federal forestry men that has been held in the state since 1919. It was called by District Forester Paul G. Redington for the purpose of formulating more effective fire-prevention and suppression methods, and for the consideration of timber sales, grazing activities, and other problems connected with the administration and protection of the twenty million acres of Government forest land in the California District.

Important addresses were made by Major-General C. T. Menoher, commanding officer of the Ninth Corps Area; Major Edward H. Bowie, District Forecaster, U. S. Weather Bureau; Charles G. Poole, of the U. S. Biological Survey; M. B. Pratt, State Forester for California; Dr. B. F. Rastall, manager of Californians Inc.; and Professor Walter

Mulford, head of the forestry school of the University of California.

The greater part of the conference meetings was given over to the consideration of the findings and recommendations of the Forest Service Board of Fire Review, based on the experiences of the 1924 fire season, during which 2657 forest fires occurred in California, burning over 1,065,039 acres, and causing damage to timber, forage, and improvements estimated at more than five million dollars. All phases of forest-protection and fire-suppression work were discussed by the foresters, from public co-operation in the prevention of the 70 per cent of fires that are annually caused by human carelessness, to law enforcement and the many details of actual fire-fighting and control work in the woods. Among the important recommendations adopted by the conference were:

The establishment of training schools for new rangers;

More intensive training of all men employed temporarily during the fire season;

That the support of the public, both urban and rural, must be secured before satisfactory protection of our forests can be realized;

While adequate state forest fire laws are important in dealing with incendiarism, carelessness, and negligence, need for active co-operation of peace officers and local justices in the enforcement of the present fire laws is paramount;

That fire weather forecasting in co-operation with the United States Weather Bureau be developed to the fullest extent;

That the use of water by engine-driven pumps and hand pumps be extended as fast as funds are available;

That a forest-fire hazard survey of all forest areas be initiated at once, so that an adequate system of fire-breaks and the reduction of fire hazard can be made as rapidly as funds will permit;

That airplanes be used for the reconnaissance of going fires and checking on locations of fires in areas obscured from the standard Forest Service lookouts now located on high peaks;

That the technique of fire prevention and suppression be developed to the highest point of efficiency.

Two days of the conference were given over to practical field work on the forested lands of Spring Valley Water Company (the

San Andres watershed), placed at the disposal of the Forest Service through the courtesy of the Company. The first day in the field was spent in solving a fire-suppression problem—one hundred and fifty rangers and supervisors fighting an imaginary fire that was supposed to have swept over three hundred acres of brush land before being discovered. To control this conflagration, fire camps were established and connected by emergency telephone lines; men, supplies, and fire-fighting tools transported to the scene, and fire lines laid out to check the on-rushing fire. After a stubborn fight the fire was controlled by night, and the men gathered together to hear the findings of the Board of Review which had closely followed each step taken to control the blaze.

The second day was spent in testing new and improved fire-fighting apparatus. Practice was had with portable fire-pumps that could be handled by two men, and which would throw a sizable stream of water at



U. S. Forest Rangers stage a sham battle against fire on the San Andres watershed of Spring Valley Water Company. These lines threw sizable streams along the ridge 1500 feet from San Mateo Creek, where they were supplied with water by portable twin-cylinder gasoline-driven pumps

fifteen hundred feet from the source of supply, or several times that distance by using pumps and water-tanks in relay. Experiments were also conducted with portable water-containers carried on a man's back and equipped with a hand force-pump—this apparatus being especially effective for the extinguishing of flames in burning logs and dead trees. Another important new in-

vention was a portable flame-thrower, operated with coal-oil or gasoline, which could be used for burning brush or back-firing on large conflagrations. A side-hill plow and scraper adapted for use in building fire lines and mountain trails was also given a trial. All of these inventions have been adopted as standard equipment for Forest Service fire-fighters in California.

Fire! — Friend or Foe

By Frank Sweeley, U. S. Forest Service

ATERRIBLE foe invades our home lands—fire running amuck! No enemy is more ruthless or destructive, none will reduce more quickly our resources of timber and watersheds to utter devastation.

Fire! It has just started along a trail and it flaunts a thin wisp of smoke in derision. It was not caused by lightning. Therefore, in that locality, some man was careless with a blazing match or burning tobacco, or left a camp-fire unextinguished. The thermome-

ter stands at 105 degrees; the air is dry. The enemy has chosen its time well.

High on a peak that commands the country below is the sentinel—the lookout man of the Forest Service. One quick “shot” with the alidade or locating instrument, a hurried ring of the telephone, a message to an officer far away giving the location of the fire—and the ranger force is in action.

One-half hour later the enemy has advanced to a conflagration of immense pro-



Fire on the watershed. The forest rangers started it as part of their field work, in order to test the most expeditious method of putting it out

portions. Along an imposing front, swept by high winds, move the flames; the smoke billows up in great black and gray clouds. Of all the seven devils, fire is the most evil. The enemy has attacked with unmistakable fury, and the rangers recruit men from far and wide and go into the fight in full battle array. Several hours later the fire organization takes form for a stubborn, protracted, heart-breaking struggle that may extend over days or weeks.

There is the supreme command with headquarters behind the lines. Maps are on the table and on the wall. Men come and go. The telephone, connected with the battle-line, rings insistently. The field general at the front has designated his captains, lieutenants, sergeants, and corporals to handle the fire-fighters; all his strategy and technique of fire-fighting are called into service. Scouts go ahead to ascertain the position of the fire. Base and field commissaries are established for supplying equipment and feeding men—perhaps hundreds of men eventually. Before night sets in the roar of the flames, as some steep slope is laid waste, can be heard for

miles, and the air is choked with smoke. Puny man in a struggle with nature's most terrifying element—an element that is kindly when used carefully, but a demon when unleashed!

Communication men have set up field telephones wherever needed, connected with the supreme command, in order that the fight on all sectors may be correlated and progress or losses reported. Messengers carry written instructions to outlying posts in order that men in command, removed from the telephone, may do their work effectively and intelligently. Perhaps an airplane drones overhead carrying an observer who will report where the enemy is most vulnerable.

It is as much a battle as any warfare with guns.

In such heroic struggle can man hope to win? By experience it is known that he can. By everlastingly fighting back, by taking advantage of natural barriers, improved weather conditions, and the employment of the fighting technique developed through the years, the enemy can be narrowed down, cut

(Continued on page 14)



While one group of forest rangers works, another group stands by to observe and comment. Then the positions are reversed

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EDWARD F. O'DAY, Editor

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ONE of the significant addresses of the conference of U. S. Forest Rangers held recently in San Francisco was made by Major Edward H. Bowie, District Forecaster, U. S. Weather Bureau, who spoke on "Humidity in Relation to Fire Hazard."

The relation of humidity to fire hazard, Major Bowie pointed out, is exceedingly close. Humidity is the amount of water-vapor in the air. When expressed in the number of grains of moisture per cubic foot of air, it is called *absolute humidity*. When expressed in the form of a percentage, as the ratio of the actual quantity of moisture in the air to the quantity that would saturate it under its actual conditions as to pressure and temperature, it is called *relative humidity*.

The Weather Bureau records relative humidity at 5 A.M. and 5 P.M. every day. A relative humidity of from 75 to 80 per cent at 5 A.M. is regarded as normal. When relative humidity is 100 per cent, the air is completely saturated with moisture, a condition precedent to rainfall.

To say that relative humidity is high in a forest area is to say that the air is moist, and of course the forest is moist too, for the moisture in the air condenses in the form of dew or frost, wetting the trees, underbrush, duff, and litter of the forest area. Under such conditions the danger of fire is remote. But when relative humidity is low, the air is dry, and so is the forest, due to the process of evaporation. The lower the relative humidity, the dryer the trees, brush, and duff. Under such conditions fire is a present danger.

Last summer, Major Bowie pointed out, a period of very low humidity was recorded. It was particularly marked in the San Gabriel National Forest, where at one time

relative humidity fell to almost three per cent. A warning went out from the Weather Bureau to beware of forest fires. It did not reach the San Gabriel National Forest in time. A bad fire had started before the warning arrived, and it was not brought under control until the period of very low humidity came to an end.

It is not alone in the forest areas, according to Major Bowie, that low humidity should be regarded as a fire warning. A striking instance of the relation of low humidity to fire hazard was afforded by the Berkeley conflagration which occurred on September 17, 1923. Consider the record of relative humidity for three days, up to and including the day of the Berkeley fire:

	At 5 A.M.	At 5 P.M.
September 15.....	97	85
16.....	87	31
17.....	30	64

* * *

THAT fire-fighting was a problem, not unconnected with other delicate problems, in the far-off days of the Roman Empire, is brought home to us in a very vivid manner by the Letters of Pliny the Younger. This distinguished Roman (the same that gave us the famous description of the eruption of Vesuvius and the destruction of Pompeii and Herculaneum) was Governor of the province of Bithynia in Asia Minor under the Emperor Trajan. In one of his letters to the Emperor he wrote:

"You will consider, Sir, whether it may not be advisable to institute a company of firemen, consisting only of one hundred and fifty members. I will take care that none but those of that business shall be admitted into the company, and that the privileges granted them shall not be abused. It won't be hard to regulate so small a number."

The Emperor's response indicates that there were political factions to be feared outside the Pretorian Guard. He wrote (and his letter evidently closed the correspondence):

"We must remember that the province (of Bithynia), and that city in particular (Nicomedia), have been vexed by factions of that very sort. It will be better to provide such machines as are of service in extinguishing fires, enjoining the owners of houses to prevent the spread of flames, and if necessary to call in the aid of the populace."

Fire!—Friend or Foe

(Continued from page 12)

off at last bit by bit, and finally conquered.

Destruction! destruction! in the crackle of burning brush! Ruin! ruin! in the roar of timber afire! Then gray devastation and black desolation as the melancholy aftermath. Perhaps valuable property has gone in smoke. Perhaps life has been offered in sacrifice to the fangs of the Moloch! What responsibility that man assumes who handles fire in the woods!

The two February days spent by the 175 supervisors, technical men, and rangers of the United States Forest Service on Spring Valley Water Company's land, were given over to developing fighting technique and strategy. An imaginary fire of three hundred acres, burning in valuable timber and brush watersheds, was turned loose. Lines to be used for back-firing were constructed to stop the supposed flames. Mopping-up crews followed and put out all imaginary smouldering logs, snags, or sparks. A Board of Review later criticized the methods used. Special equipment was thrown into the fight. Flame-throwers for starting back-fires. One-man-pack water containers with a force-pump attachment were used for putting out snags and logs. A miner's lamp was demonstrated for illumination at night when lines are cleared far in advance of the flames. A number of portable twin-cylinder gasoline-driven pumps were started, and long stretches of hose carried water under pressure to high elevations. Trucks rushed equipment and men to the fire-lines.

Special equipment valuable in its sphere has nevertheless distinct limitations in use.



To put out flames in burning logs and dead trees, the forest rangers use a hand force-pump attached to a metal water-container strapped on the back "Alaska pack" fashion

The Red Demon of the Woods will still be fought and conquered by strategy and well-directed man-power using the shovel, McLeod tool, mattock, axes, saws—and "stick-to-itiveness."

But why such devastation of vital resources? Why such a total of physical suffering and hardships that come with the hardest work in the world—fighting fire? Why the loss of property and occasional loss of life? Let us swat the man who sets the fire. Let us prevent warfare with that awful force which, when used carefully and cautiously, has made civilization possible.

Fire Prevention on Watersheds

By W. B. Lawrence, Superintendent, Water Division

"THERE is altogether too much carelessness with fire in a country where half the property is liable to become a victim to the flames."

So the *Times-Gazette*, of Redwood City, San Mateo County, thundered editorially in September of 1877. After forty-seven years the hazard still exists, but fortunately there

is organized effort to offset human carelessness, and San Mateo County fires are not allowed to devastate as of yore.

The chances are that the editor had just come in from fire-fighting when he wrote the editorial from which the quotation is taken. That month there had been some bad fires in the county. The Sawyer Tract, part

of the San Andres watershed of Spring Valley Water Company, covered with a thick second growth of bay, oak, and madrone, ten years old, had been desolated. "In some places," the newspaper reported, "the soil is covered with ashes nearly two feet deep. A bird's-eye view of the burned district presents a picture of desolation at which those familiar with the former charming characteristics of the San Andres Valley will feel something of a personal loss." Another fire in the same region had just previously burned over some 640 acres. It was started by careless campers.

"On Sunday last the heavens seemed to be on fire in that portion of this county lying west of San Andres Reservoir," the *Times-Gazette* reported on September 21, 1889. The editor was not exaggerating, for that fire of '89 that looked as though it had invaded the heavens is well remembered by old-timers in the county. "As far south as San Jose," the editor testifies, "the sky was darkened by heavy clouds of smoke, and each evening the sun set looking like a

blood-red disk with a brown background."

A week later the editor went over the ground and reported that "a space nearly twelve miles square had been completely denuded of underbrush, the trees burned, fences and cordwood destroyed, and nothing but a black patch left to mark the place where a large forest of timber and undergrowth had stood." This fire destroyed a mile of Spring Valley flume.

After this big fire on the San Andres watershed, it became the custom of the Company to plow a fire-guard along all growing timber, and to burn the grass on the watershed east of San Andres and Crystal Springs lakes. For better control, grass was burned before it began to dry, and preferably at night.

A few years later, the better to safeguard the beauty of the countryside, it was decided to fire-guard along all roads, and burn all the grass between the roads and the fire-guards at opportune times. But this method injured many growing trees, so it was later abandoned. Now, each spring, the Company



A forest ranger demonstrates a flame-thrower used in back-firing, for the benefit of W. B. Lawrence, of Spring Valley Water Company

plows with a disk plow, and harrows, a strip about ten feet wide along all roads, highways, planted areas, and growing timber where possible.

Since this course was adopted, there have been no serious fires on the property. True, there have been numerous occasions when a lighted match or burning tobacco, carelessly thrown away, ignited the dry grass; but the fire burned to the fire-guard and stopped. In one or two instances, owing to high wind, the fire has passed the fire-guard, but fortunately was observed at the start and extinguished before it did serious damage.

Where the wooden flumes of the Company pass through timbered country, it is customary, every two years, to remove all the growing timber for a distance of fifty feet on both sides of the flumes, and on the lower side of the flumes to remove all grass and weeds for a distance of six or ten feet. Owing to this precaution, no flumes nor structures have been lost during the last twenty years.

As an added precaution, the Company, in 1909, built fire-breaks, thirty-two miles in length and from ten to fifteen in width, along the tops of all the ridges through its properties. These fire-breaks could be used as a base for back-firing, if fire should enter the properties from adjoining territory. They are so constructed that they can be traversed by automobile or truck, thus affording quick transportation for men and fire-fighting apparatus. Trails are kept open to make the properties accessible.

Owing to their rare scenic beauty, the properties of the Company appeal strongly to the public, so the fire hazard would be great unless very special precautions were observed. Access to certain regions is by permit only, and the permit-holder agrees to abide by rules designed to minimize danger of fire. Every spring the properties are posted with warning signs for the same purpose.

* * *

The Spring Valley Gateman

(Continued from page 9)

A pipe is "bleeding" when it has been cut all around but not quite severed, and the water is beginning to ooze through.

There is quite a bit of ceremony about closing a gate for a replacement or repair job, a ceremony in which the Fire Depart-

ment takes part. First the gateman telephones to two officials of Spring Valley—the Superintendent of City Distribution and the Assistant Manager of the Water Sales Department—that the shut-down is about to take place. From the Spring Valley Building the message goes immediately to the Fire Department. It is received by a fireman at the high-pressure station on Jones Street between Sacramento and Clay, where men are stationed twenty-four hours a day, working in eight-hour shifts, to receive and transmit just this information. Jones Street telephones the information to the fire companies in the district where the shut-down is to take place. Then, and not till then, the gate is closed. The routine is perfect, and the control is absolute. The same course is repeated when the gates are opened again.

Suppose fire breaks out in a district where there has been a shut-down to permit replacement of a piece of pipe. Obviously, when the section of pipe is taken out, the line is wide open. Open the gate, and the water will waste. There is a routine for this too. The street gang is equipped with wooden plugs that fit the pipe. If there's a fire, plugs are shoved into the open ends of the line, and the pipe-ends are rapidly but carefully braced. Then the gate is opened. That makes it possible to use every hydrant in the area where the work is being done.

One of the worst fires Mike Griffin remembers was the Berkshire Hotel fire. He remembers most vividly of all the spectacle of Fire Chief Tom Murphy climbing a ladder to the flaming hell of the second story and making his way within the building.

"I never expected to see Tom come out," says Mike Griffin. "There was fire above and below and to right and left of him, and although the firemen had a stream of water on the window where he went in, the flames were belching out on both sides of the stream. I wouldn't have gone in there if they gave me the whole of San Francisco. But the Chief is very cool at a fire, and he never sends a man where he won't go himself."

* * *

"The rude, affectionate rain falls blessedly on the land—on the roofs, on the fields, on everything. It fills the streams. It soaks to the roots of things. It fills the secret caverns of the earth and the crevices of the spirit, as well."—*S. F. Call.*

THE alarm of fire acted like the touch of a magician's wand. The vitality of the whole city was in an instant arrested and turned from its course. Theatres, saloons, and all public places, were emptied as quickly as if the buildings themselves were on fire. The business of the moment was at once abandoned, and the streets filled with people rushing frantically in every direction—not all towards the fire, by any means; few thought it worth while to ask even where it was. To know there was a fire somewhere was quite sufficient, and they made at once for house or store, or wherever they had any property that might be saved, while, as soon as the alarm was given, the engines were heard thundering along the streets, amid the ringing of the fire-bells.

J. D. BORTHWICK,
DESCRIBING THE SAN FRANCISCO
OF 1851



OW DOTH THE
FIRE RAGE , THAT
MERCILESS ELEMENT ,
CONSUMING IN AN
INSTANT WHOLE
CITIES! WHAT TOWN
OF ANY ANTIQUITY OR NOTE HATH NOT
BEEN ONCE—NAY , AGAIN AND AGAIN ,
BY THE FURY OF THIS MERCILESS
ELEMENT , DEFACED , RUINATED , AND
LEFT DESOLATE ,

—BURTON'S ANATOMY OF MELANCHOLY

July 25



SAN FRANCISCO
Water

ADDRESS OF JOHN B. MONTGOMERY,
COMMANDER U. S. SHIP "PORTSMOUTH," IN THE PLAZA
OF YERBA BUENA, JULY 9, 1846, AFTER
RAISING THE AMERICAN FLAG

FELLOW CITIZENS:

I address all classes, whether native or foreign residents of California, who cordially assent to the transaction just witnessed: I have the pleasure to announce that the flag of the United States was, on the 7th inst., hoisted at Monterey, and will, I expect, this day be substituted for the revolutionary flag recently hoisted at Sonoma.

The proclamation of the U. States Naval Commander-in-Chief, now at Monterey, which is about to be read to you, has already been widely circulated in the country; and the advantages which cannot fail to accrue to the population of this fine country, as therein set forth, have and will undoubtedly meet with a cordial reception by all classes of the people in California.

It is earnestly recommended to all that they continue in the quiet pursuit of their proper occupations, in which, under the shadow of that glorious banner, there can be no fear of oppressive or undue interruption. After leaving this place, all persons who are disposed to unite in the formation of a local militia, to be held subject to drill and such military duty as the public security under the new order of things shall call for, are invited to attend at the house of Wm. A. Leidesdorff, Esq., where arrangements will be immediately entered into for such an organization.

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The Plaza of San Francisco

By the Editor

SEVENTY-FIVE years ago—on October 18, 1850—the steamer "Oregon," from New York, passed through the Golden Gate, gaily decorated and flying a large flag with the inscription "California is a State." As she rounded Clark's Point, her bell pealing joyously, the citizens who thronged the hills of San Francisco cheered and shouted. That night was one of mad rejoicing. There were great bonfires in Portsmouth Square, fireworks, and the booming of two large cannons.

In celebrating the Diamond Jubilee of California it is impossible to overlook Portsmouth Square, otherwise known as the Plaza. Historical, literary, and legendary associations cluster about this square. History was made there before the "Oregon" brought her epochal message, for it was in the Plaza of Yerba Buena that Commander John B. Montgomery of the U. S. Ship "Portsmouth" first raised the American flag on the peninsula, July 9, 1846.

Through the colorful years that followed the Plaza held its importance as the center of San Francisco life. Today it is still important in our municipal scheme of things, though recent happenings there have drawn upon the past to make them significant. The Plaza is now a stage-setting, not a civic center.

Curiously enough, the Plaza, sacred to

patriotism, is an international shrine as well. Pilgrims journey thither from all over the world to do honor to Robert Louis Stevenson, and incidentally to salute the city that erected the first of all Stevenson monuments. The Stevenson Memorial in the Plaza has won a dignified renown for San Francisco in all the literary capitals of Europe and on the beaches of all the seven seas.

In the story of the Plaza there is one interlude of comedy, supplied

by the awkward efforts of the dead and gone Bensley Water Company to maintain a fountain there. Bret Harte deemed this fountain worthy of a satirical line or two, so that the old water company that was absorbed by Spring Valley as long ago as 1865 is entitled to a footnote, at least, when the poems of Bret Harte come to be adequately edited.

I. Yerba Buena

As late as 1833 there were no dwelling-places in what is now San Francisco, except at the Presidio and the Mission. Yerba Buena, as the Cove on the western shore of San Francisco Bay was called, was without a single inhabitant.

According to William Heath Davis, who visited the Bay in '33, and who wrote a very valuable book later on, "at the place now occupied by Portsmouth Square there was growing a crop of Irish potatoes enclosed by



Mexican Custom House in Plaza of Yerba Buena, in front of which the Stars and Stripes were raised July 9, 1846

a brush fence, the crop having been planted by Candelario Miramontes, who resided near the Presidio with his family."

The credit for founding Yerba Buena belongs to Governor Figueroa. The Bay was attracting hide-droghers and whaling-ships, and, as the anchorage in the Cove was better than at the Presidio, the Governor decided to establish a trading-post there. Figueroa chose as harbor-master an Englishman, Captain William A. Richardson, who had a ranch at Sausalito and two small schooners on the Bay, in which he collected hides and tallow from the Missions of Dolores, Santa Clara, and San José.

Richardson drew the first plan for the town of Yerba Buena by the simple expedient of laying out *La Calle de la Fundacion* (Foundation Street), which started at about the present intersection of Kearny and Pine and ran northwest. On the north side of this street, in the midst of chaparral and sand-dunes, Captain Richardson housed his family. So he is our Oldest Inhabitant. This was in 1835. In '36, Jacob P. Leese built alongside of Richardson. He was our first merchant. Leese married a sister of General Vallejo, and the union was blessed in 1838 by a daughter, Rosalie. She was our first Native Daughter.

To locate the site of these first two dwellings, stand facing west at Clay and Grant Avenue: Captain Richardson had a hundred-vara lot on your right hand, and Jacob Leese's place was to your left.

At first Captain Richardson and his family lived in a tent; but in 1837 he built a large adobe house which received the dignified name of *Casa Grande*. It survived until 1852.

In 1839, at the instance of Governor Alvarado, Francisco de Haro, Alcalde of

Yerba Buena, commissioned a Swiss surveyor by the name of Jean Jacques Vioget to make a survey of the town. The Plaza does not appear on his map, but it may have been taken for granted.

Helen Throop Purdy, the historian of our Plaza, advances the plausible thought that "the site of Miramontes' potato-field was chosen for the Plaza because that ground had been cleared and cultivated, and all the other blocks were drifting sandhills or chaparral thickets."

The receiver of customs at first made his headquarters in Captain Richardson's *Casa Grande*, but in 1844 the building of a Custom House was authorized, and it was erected at the northwest corner of the Plaza. It was to cost \$800, but actually it cost \$2800. It was of adobe, with a tile roof, and contained four rooms. In front of it was a flag-pole from which flew the Mexican flag. Later on this adobe building was the headquarters of the Alcalde.

In this adobe building the government business of the sleepy little town of Yerba Buena was transacted until the 9th of July, 1846, when a very important event thrilled all the inhabitants into wakefulness and wonderment about the future.

II. *A Change of Flags*

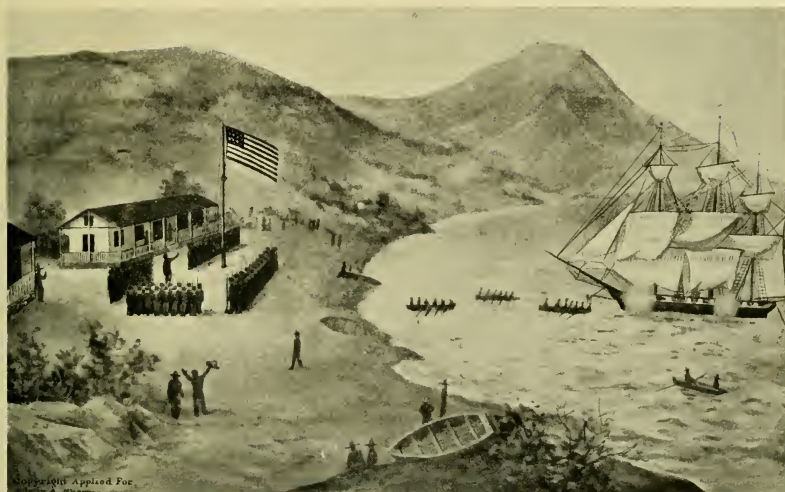
On July 7, John D. Sloat, Commander-in-Chief of the United States naval forces in the Pacific Ocean, wrote from his flag-ship "Savannah" in the harbor of Monterey to Don José Castro, Commandant General of California, as follows:

"The central government of Mexico having commenced hostilities against the United States of America, the two nations are now actually at war; in consequence, I call upon you in the name of the United States of

THE PLAZA

BY BRET HARTE

*If thou wouldst view the Plaza aright,
Go visit it by the pale moonlight;
For the gay beams of lightsome day
Show that the fountain does not play.
When the broken benches are hid in shade,
With many a vagrant recumbent laid;
When the clock on the Monumental tower
Tolls to the night the passing hour;
When cabman and hackman alternately
Entreat and threaten—indulging free
In coarse yet forcible imagery;
When the scrolls that show thee the playhouse
nigh,
In monstrous letters do feign and lie,
Of "Fun divest of Vulgarity";
When Bella Union is heard to rave
O'er the last conundrum the minstrel gave;
When the street-boy pauses—intent upon
The band at Gilbert's Melodeon—
Then go—but go alone the while,
And view John Bensley's ruined pile,
And, home returning,—do not swear
If thou hast seen some things more fair.*



Copyright Applied For
Edwin A. Sherman

Commander Montgomery raising the American flag in the Plaza while the U. S. Sloop of War "Portsmouth" salutes with all her guns. This drawing was made from descriptions of the scene and the geography of the Cove of Yerba Buena, for the "Life of John Drake Sloat," by Major Edwin A. Sherman, Oakland, 1902

America to surrender forthwith to the arms of that nation under my command."

The day before, he had despatched a letter to Commander John B. Montgomery, aboard the U. S. Ship "Portsmouth" in the Bay of San Francisco, in which he wrote:

"I have determined to hoist the flag of the United States at this place tomorrow, as I would prefer being sacrificed for doing too much than too little.

"If you consider you have sufficient force, or if Fremont will join you, you will hoist the flag of the United States at Yerba Buena, and any other proper place, and take possession, in the name of the United States, of the fort and that portion of the country."

Accordingly, on the 8th of July, Commander Montgomery wrote to William A. Leidesdorff, Vice-Consul of the United States at Yerba Buena, as follows:

"At $\frac{1}{2}$ past seven o'clock tomorrow morning I propose landing a considerable body of men under arms, and to march them from the boats to the flagstaff in Yerba Buena, upon which at 8 o'clock I shall hoist the Flag of the U. States under a salute of twenty-one guns from the Portsmouth, after which, the Proclamation of the Commander

in Chief Commodore Sloat will be read in both languages for the enformation [*sic*] of all classes."

It was a peaceful occupation. Commander Montgomery landed with seventy sailors and marines at the foot of Clay Street, marched with music to the Plaza, and raised the Stars and Stripes. The Mexican flag had been hauled down before he arrived by the receiver of customs. Obviously, July 9, 1846, is the most memorable date in the history of the Plaza, or Portsmouth Square, to give it the name that it ever afterwards officially bore. In further commemoration of this event, the name of the Embarcadero was changed to Montgomery Street.

III. A Civic Center

Until 1848 the old Custom House was the only building on the Plaza, although others had risen roundabout. In '48 a schoolhouse was built on the west side of the Plaza. Here, on June 22, 1849, Stephen Massett ("Jeems Pipes of Pipesville") gave the first public entertainment in San Francisco (Yerba Buena had become San Francisco in '47). There were four ladies present, "probably all there were in town," wrote Charles Warren Stoddard.

When the discovery of gold in California made San Francisco a city, the Plaza became an amusement center. Rowe's Olympic Circus was tented on Kearny Street near Clay. Washington Hall was built on Washington Street, opposite the northern side of the Plaza. Here, in January, 1850, the city saw its first play—"The Wife," by Sheridan Knowles. That year, too, Thomas Maguire opened his first theater, the Jenny Lind, on Kearny Street. It burned down, was rebuilt, burned down again, and then built of brick. In 1852 this Jenny Lind Theater of brick was sold to the city for use as a City Hall. Because Tom Maguire named his first playhouse after the great Swedish singer, the legend grew that Jenny Lind once sang in San Francisco; but P. T. Barnum, her American manager, never brought her to the West. After selling his Jenny Lind Theater to the city, Maguire built his Opera House on Washington Street between Kearny and Montgomery, just around the corner from the Plaza. Junius Brutus Booth and his great son, Edwin, (they lived on Telegraph Hill) were among the players who made theatrical history there, not only for San Francisco, but for the United States. One day in 1856 a newspaperman named Theodore James Capen Adams, the great grizzly-bear hunter, giving an exhibition of his bears at the northeast corner of Kearny and Clay. He went in and interviewed Adams, and the re-

sult was one of the greatest books for boys ever written.

"Opposite the eastern and northern sides of Portsmouth Square," writes Mrs. Purdy, "were bowling-alleys, billiard-rooms, and the gambling - saloons of which we have read so much, brilliantly lighted, elegantly furnished according to the times, and thronged with players and visitors. But while we read in history and fiction the lurid tales about them, we should not forget that, while they were bordering the Square on the east and north, to the south were growing up solid business houses and to the west churches of all denominations."

San Francisco's first brick building was erected in '48 by Mellus & Howard, at Clay and Montgomery. San Francisco's first bank, Wright & Company's Miners' Bank, was housed in '49 at the northwest corner of Kearny and Washington; and on Brenham Place, opposite the western side of the Plaza, rose the headquarters of Monumental Engine Company, whose bell was used so dramatically by the first Vigilance Committee.

Before the end of '49 the Custom House and the schoolhouse had disappeared from the Plaza, but nothing was yet done to beautify it. Indeed, there seems to have been

a pound there for stray cows and mules. Yet it had plenty of human color.

"Men of all races," says Mrs. Purdy, "passed up and down its borders, each in the characteristic garb of his nation—Turks in

YERBA BUENA

JULY 9, 1846

BY GEORGE STERLING

*To Columbia, the Mother, a dark-eyed babe
was brought,
In that far year when Mexico and our young
legions fought.
Around her mighty footstool then stood offspring
east and west,
But never one like that strange child she gather-
ed to her breast.*

*And never one Columbia held gladlier her own—
A babe, a child, a wistful girl, a maiden fair
and grown.
Awhile she sought the fostering breast, and ere
its milk was cold,
She brimmed the Mother's needy lap with
tribute of her gold.*

*Then year by year her empire grew, from snows
to ocean sands,
A wonder-tale, a song of hope, a star to sadder
lands.
There gleaned that El Dorado, the bright
Hesperian Isles,
Where ever woke the fadeless flower to Nature's
tender smiles.*

*Thrice happy they who on her hills find suste-
nance and peace,
No seas more blue 'round Italy, no skies more
mild o'er Greece.
Careless and prodigal from youth, no thought
of thrift she knows,
Who to her sisters north and east holds forth the
grape and rose.*

*Yet can she never be as they: her wilder blood
demands
A richer music, madder love, than those of
colder lands.
The hoyden of her Mother's hearth, she finds in
every vein
The Saxon urge, the Norman dream, the impa-
sioned blood of Spain.*

Hittell discovered



Portsmouth Square in 1858, viewed from Clay and Kearny streets, looking toward Washington. This was before upper Kearny Street was widened. In the building at the corner of Kearny and Washington the Pioneers met after the death of James King of William and decided to stand with the Vigilance Committee, then in process of organization

turbans, Russians in furs, Chinamen with queues, tattooed New Zealanders, Chileans, Peruvians and Mexicans in serapes shading from somber to gay, Kanakas, Malays, Californians on prancing horses with silver-mounted trappings, and a mixture of Americans among them all."

On October 18, 1850, as already noted, the first news of California's admission to the Union reached San Francisco, and the glorious event was celebrated in the Plaza. It was the natural place for all sorts of celebrations, rallies, political gatherings, and mass-meetings of the citizens. The indignation meetings that led to the formation of the two Vigilance Committees, in 1851 and again in 1856, were held in the Plaza. In 1859 all San Francisco gathered at the Plaza to hear Colonel Baker deliver his great funeral oration over the body of Senator Broderick, who had been mortally wounded in his duel with Judge Terry at Laguna de la Merced.

The fashionable shopping district reached up to the Plaza from Montgomery Street. So

did the popular promenade. The principal cab stand of San Francisco was along its Kearny-Street front. On the east side of Kearny Street was the depot for the Butterfield Overland Stages, and for the busses that ran to North Beach and the Presidio, to South Park and the Mission Dolores.

IV. *The Bensley Fountain*

On March 26, 1861, the following squib appeared in the *Evening Mirror*, a daily long since "sunk without trace":

"A poetess in the East asks:

"What is the news in the golden land?
How does the great Pacific stand?
Do her rocks, and sands, and clays yield gold,
As they did in the bounteous days of old?"

"Answer:

"The Golden State keeps her old repute,
And the sound of the rocker is never mute;
Her waters still flow as they did of old,
And her streams wash down the sparkling gold."

"Question (prose):

"How does Montgomery Street look? Is it

still the promenade of the Pacific beauties, and its corners the congregating points of impudent 'sports' and decayed politicians? And the Plaza—what about it? Do tell me! Has it got a fence?"

"Answer: — Montgomery Street! Why, it would do your eyes good to see it. Splendid stores, gorgeous jewelry-shops, towering palaces, and no less than two Academies of Music! Broadway and Chestnut Street are not much in comparison. It continues the center of Female attraction, while the same old 'sports' and politicians are still 'around.' They are now employed as 'props,' to keep Montgomery Block from tumbling over. The Plaza! Now you talk! Has it got a fence? 'We flatter ourselves' that it has a

fence; and an iron one at that, go to! And what is more, it has shrubbery, (two live cotton-woods,) serpentine walks and splendid benches for the special accommodation of idle 'greasers' and invalid Chinamen. Nor is this all, either! It has a fountain; yea, a fountain! And such a fountain! You should just see it squirt! So great is the volume, and so high does it throw the water into the depths of ether that fears are entertained lest it quench the stars and put out the sun! They do say, too, that it is a great convenience to the 'Man in the Moon,' and that all he has to do, as he passes over it, is to hold out his pitcher and catch the fluid—thus getting his daily supply of water free of charge. 'Has the Plaza got a fence, indeed!' You bet it has!"

It is true that the Plaza had a fence, as this satirical journalist reported. The Plaza had been graded in 1854, and surrounded by a very plain wooden fence. By '56 the cotton-woods had been planted, and an iron fence took the place of the wooden one.

[The history of the fountain is not easily traced. Doubtless it was given to the city by John Bensley, of the San Francisco City Water Works, as an evidence of civic con-

sciousness. But unfortunately it did not work very well—its jet of water was low, languid, spiritless. Indeed, this fountain was an intermittent fountain, though not intended to be

such. It was a source of amusement rather than a water source. It took no hold on San Francisco affections, as Lotta's Fountain did in after years. Rather it is to be classed with the Cogswell fountains, though it was not pretentious enough to offend the artistic sense. It was, indeed, a fountain of derision.

In the *San Francisco Journal* of May 22, 1862, it was referred to in these contumelious terms:

"THE PLAZA FOUNTAIN.—This farcical institution of the pure water (Bensley style) was

at work once more this afternoon, and certainly did throw from the central tube a volume of water, about three feet in height, while the side-pipes squirted each a stream of about an inch in diameter to the height of the principal stream. Verily this is one of the institutions of San Francisco. Strangers visiting our city should not fail to go and see this crystal fountain, when in operation."

The *Journal* writer allows us to glimpse the equipment of the fountain, though not its architecture. Apparently the *Journal* deeply resented this fountain, for there is another "paper bullet" fired at it on June 7, 1862, in these terms:

"THAT BENSLEY FOUNTAIN.—On yesterday quite a group of persons assembled on Kearny Street, and some even ventured so far as to cross the street for the purpose of admiring that 'institution,' the Plaza Fountain, which was 'really' throwing water from its various mouths to the height of five feet. Much admiration was excited by the exhibition, and all parties left, perfectly satisfied that it was a—humbug."

But it remained for Bret Harte to give this Bensley Fountain a place in literature. Readers will look in vain for the poem on

AT THE STEVENSON FOUNTAIN

BY WALLACE IRWIN

*Perhaps from out the thousands passing by—
The city's hopeless lotos-eaters these,
Blown by the four winds of the seven seas
From common want to common company—
Perhaps some one may lift a heavy eye
And see, dream-blown across his memories,
Those golden pennons bellying in the breeze
And spread for ports where fair adventures lie.*

*And O! that such a one might stay a space
And taste of sympathy, till to his ears
Might come the tale of him who knew the grace
To suffer sweetly through the bitter years;
To catch the smile concealed in Fortune's face
And draw contentment from a cup of tears!*

"The Plaza" in the ordinary editions of Bret Harte's collected poems, for it was unearthed from the files only a few years ago. It is far from being one of his best poems, and it is not complimentary to the Bunsley Fountain, yet it certainly deserves quotation in SAN FRANCISCO WATER among the poems inspired by the Plaza.

V. Robert Louis Stevenson

San Francisco left its impress on Robert Louis Stevenson. There is much of San Francisco in his letters and in "The Wrecker," and he painted the whole San Francisco of his time in that fine essay entitled "A Modern Cosmopolis."

Stevenson spent one year in California, and of that time about six months in San Francisco—roughly, from Christmas, 1879, to May, 1880. It was an important period

of his life. Here he finished "Across the Plains," wrote "The Amateur Emigrant" and some of his best essays, including those on Thoreau and Yoshida-Torajiro. Here he was married. Here Charles Warren Stoddard inspired him with desire for the South Seas.

It is well known that Stevenson loved to lounge on a bench in the Plaza, studying San Francisco life, talking to wasters as they drifted thither from Chinatown, the Barbary Coast, and that old Kearny Street which Rudyard Kipling was afterward to name "the Street of Adventure."

The Plaza, therefore, was a happy place for a memorial to Robert Louis when a little group of Stevensonians decided to do him honor in the city of which he was so fond.

News of the death of Robert Louis reached

TO
ROBERT LOUIS STEVENSON

BY BRUCE PORTER

*O Sailor, sailing the Unfathomed Sea,
What wind now speeds thee, and what
Star's thy guide?
And what adventure worth thy bravery
Calls with the lifting tide?*

*For thee the new coasts, gleaming, gleaming
still,*

*For us the hope, the plunge, the engulfing
night.*

*Oh, land! and set thy beacon on the Hill,
Our pilot into Light!*



Commander John B. Montgomery of the U. S. Navy, who carried out Commodore Sloat's instructions by making Yerba Buena American territory seventy-nine years ago



William A. Leidesdorff, U. S. Vice-Consul at Yerba Buena, who co-operated with Commander Montgomery in the memorable events of July 9, 1846

San Francisco on the first of January, 1895. It made a profound impression upon the few San Franciscans who had known him personally, and upon hundreds who loved him for his books.

The emotions of Bruce Porter found expression in clay. That very morning he shaped in his studio the first model of the Stevenson fountain. A shaft surmounted by a galleon was the original design, essentially the design of the completed memorial. The late Willis Polk visited Bruce Porter that afternoon, and the two friends worked over the model.

The memorial itself was a happy inspiration; happy also was the thought of placing it in the old Plaza. A committee was formed to gather subscriptions, consisting of Mrs. Virgil Williams (who had been a witness at the Stevenson marriage), Mayor James D. Phelan, Horace G. Platt, Louise Imogen Guiney, and Bruce Porter.

The Stevenson Fountain—the world's earliest monument to R. L. S.—was unveiled in the Plaza October 17, 1897. It consists of a

granite shaft thirteen feet high topped by a bronze galleon under full sail. "To Remember Robert Louis Stevenson," the inscription reads, and then follows the famous excerpt from the "Christmas Sermon,"—"To be honest, to be kind," etc.

Travelers from afar go to the Plaza to see this memorial, and every year the Stevensonians of San Francisco meet there for a simple ceremony on the birthday of R. L. S. One year—about 1902—the little group included Jules Simoneau, Stevenson's friend of the Monterey days, and Miss Annie Ide (Mrs. Bourke Cockran), to whom Stevenson had so quaintly made over his birthday when she confided to him the disadvantage of having been born on Christmas.

Many poems have been inspired by the Stevenson Memorial. In addition to the sonnet by Wallace Irwin given here, there are fine verses by William O. McGeehan, Bliss Carman, and John Northern Hilliard. The tribute by Bruce Porter appeared in *The Lark*, June, 1895, while the memorial was still in the making.

Rainfall in the Bay Region

By I. E. Flaa, Office Engineer

THE study of rainfall is one of the branches of hydrology. Daniel W. Mead, Professor of Hydraulics and Sanitary Engineering at the University of Wisconsin, has defined hydrology thus: "Hydrology treats of the laws of the occurrence and distribution of water over the earth's surface and within the geological strata, and of its sanitary, agricultural, and commercial relations," from which we see that water in all its forms plays a very important part in the development of the human race.

The water on the earth and in the surrounding atmosphere is continually in motion; from the surface of the oceans and other bodies of water on the earth there is a constant evaporation taking place, due to the heat of the sun. This water in the form of vapor rises to higher levels; there it is cooled by the cold currents of air and returned to the earth's surface again in the form of rain, snow, hail, and dew. In these various forms it replenishes the parched sur-

face, causing vegetable growth, runs down rivers to the sea, is used by man in commerce, and is harnessed and caused to turn the wheels of industry. But the most important use of water is its consumption by man and beast to sustain life, and in this last use we are particularly interested.

Most rain-storms on the Pacific Coast come off the North Pacific Ocean and travel in an easterly direction across the mountain regions to the valley of the Mississippi. These storms have two motions: a forward motion and a rotary motion. They rotate around their own center counter-clockwise—that is, from right to left—and have a forward motion from west to east. The center of a storm is an area of low atmospheric pressure. As water flows from a high to a low point, so does air travel from a region of high pressure to one of low pressure, causing winds. When a storm is approaching us off the Pacific Ocean from the northwest, the wind is blowing from the southeast, and



Recording thermometer and barometer used by Spring Valley Water Co. at Sunol, Alameda County

after the storm has passed to the southeast the wind comes from the north. Thus by observing the atmospheric pressure (by the aid of a barometer) and wind direction, one is fairly able to forecast the approach of storms that have already formed out on the Pacific Ocean.

The United States Weather Bureau explains this in a note printed on their "Daily Weather Map," as follows:

"Wind-barometer Indications.—When the wind sets in from points between south and southeast and the barometer falls steadily, a storm is approaching from the west or northwest, and its center will pass near or north of the observer within 12 or 24 hours with wind shifting to northwest by way of southwest and west. When the wind sets in from points east and northeast and the barometer falls steadily, a storm is approaching from the south or southwest, and its center will pass near or to the south or east of the observer within 12 or 24 hours with wind shifting to the northwest by way of north. The rapidity of the storm's approach and its

intensity will be indicated by the rate and the amount of the fall in the barometer."

Therefore, contrary to the general belief, rain-storms do not approach from the direction from which the wind is blowing, but from the opposite direction.

The Spring Valley Water Company maintains twenty-five or more United States Weather Bureau standard rain-gauges scattered over the system, on which daily readings are observed. These readings are forwarded monthly to the engineering department, where they are tabulated and used as one of the factors in determining future developments. These rain-gauges consist of a funnel, a receiver attached to the smaller end of the funnel, an overflow vessel, and a measuring-stick. The rain is collected in the large open end of the funnel and flows into the cylindrical receiver attached to the smaller end, and is there measured by the stick. The relation of the diameter of the open end of the funnel to that of the receiver is such that the readings are magnified ten times. That is, ten inches measured in the receiver are equivalent to one inch of actual rainfall, while a tenth of an inch in the re-



Standard rain-gauge used by Spring Valley Water Co. at Pleasanton, Alameda County



Taken apart, the standard rain-gauge consists of (A) overflow vessel, (B) receiver, (C) funnel, and (D) measuring-stick

ceiver is equivalent to a hundredth of an inch of rainfall.

In the vicinity of San Francisco and over

the Spring Valley Water Company's system practically all the precipitation is in the form of rain that occurs during a six-month period, from November to April. This rain is collected in storage reservoirs, and also fills up the underground sources, and is then drawn from these reservoirs and underground sources for use in supplying the city of San Francisco during the six months' rainy season, as well as for the remaining six months when there is no replenishment.

Not only are the storage reservoirs required to supply water during the six months' dry season of every year, but also to keep a sufficient quantity of water on hand to carry over several years in which the rainfall is below normal, as was the case in the three years just past.

From a continuous record of seventy-six years, from the year 1849 to date, published by the United States Weather Bureau, San Francisco has an average rainfall of 22.23 inches, with a maximum of 49.27 inches, for

(Continued on page 13)

[Contributions to the annals of Livermore Valley, a region rich in historical lore—a region, too, from which San Francisco, through Spring Valley Water Company, derives part of its water supply.]

The First "Gringo" of Alameda County

By the Editor

THE Livermore Valley and the town of Livermore were named after Robert Livermore, the first "gringo" to settle in that part of the *Contra Costa* now known as Alameda County.

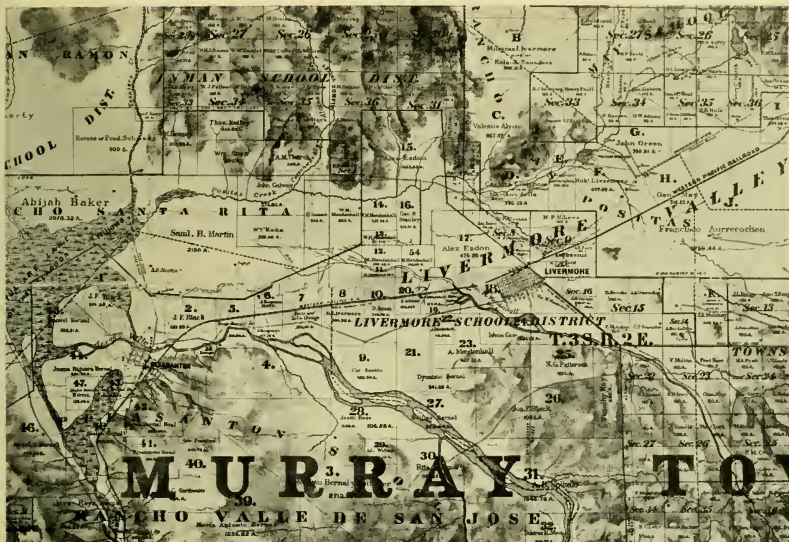
A man of strong character was Robert Livermore, and greatly beloved by the native Californians, who called him affectionately Don Roberto.

Robert Livermore was born in Bethnal Green, London, in 1799. Bethnal Green is in the East End, not far from London Docks, and the youngster probably watched the crowded shipping of the Thames until he came to yearn for something better than the mean streets of that miserable district. At any rate, he left Bethnal Green as cabin-boy on a vessel bound for the other side of the world, and he never returned. On the west coast of South America he served under the great Lord Cochrane, afterwards the Earl

of Dundonald. Too bad Don Roberto did not take the trouble to write down an account of that exciting service!

After a brilliant but stormy career in the British Navy, Lord Cochrane, in 1817, accepted the invitation of the Chileans, then in revolt against Spain, to take command of their naval forces. He remained in their service until 1822 and contributed largely to their success. Robert Livermore may have been with him in November, 1820, when he captured the Spanish frigate "Esmeralda" in the harbor of Callao, an achievement of signal daring. In 1823 Lord Cochrane transferred his service to Brazil, where he helped the Emperor Dom Pedro I to shake off the dominance of Portugal. By the end of 1825 Lord Cochrane had fallen out with the Brazilians, and he returned to Europe.

When or why Robert Livermore left the service of Lord Cochrane we do not know,



The Livermore Valley as mapped officially for Alameda County in 1879. The lagoon, to the left, is mentioned frequently in early accounts. It disappeared when the land was reclaimed by drainage. In this part of the old Rancho El Valle de San José, Spring Valley Water Company now operates its Pleasanton pumping station, an important unit of the San Francisco water supply

nor are we sure of the date of his arrival in California. Some say it was in 1820, others in 1823. As to how he arrived, there are three accounts. We are told that he reached California in a whaling-vessel, and deserted at Santa Cruz with a companion named Julian Wilson. Two accounts have him setting foot ashore for the first time in Monterey; one says that he deserted from the English brig "Colonel Young," the other that he arrived there in a hide-drogher.

The matter is not important, except as showing how difficult it is, after one hundred years, to ascertain with accuracy the exact facts about a California pioneer, even though he be as famous as Robert Livermore.

Certainly Robert Livermore had had his fill of the sea. He succumbed to the fascinations of California life, and, apparently, never quitted the state.

He turned his hand to the work that presented itself. At the Pueblo of San José he became acquainted with José Noriega. The "little Englishman," as Livermore was called, and the native Californian became firm friends and partners, their association con-

tinuing for years. "Having worked for some time in the vicinity of the pueblo on the ranch of Juan Alvarez," says M. W. Wood in his "History of Alameda County," "and there acquiring the Spanish language, he soon became a great favorite among the Mexicans [the historian means by this *the Californians*], his fair hair and captivating manners making him especially liked among the gentler sex."

At the Rancho Agua Caliente, or Warm Springs, he became acquainted with the Fulgencio Higuera family, and married Josefa, daughter of José Higuera.

We next hear of Livermore, in company with Noriega, building an adobe home and raising stock in the Sunol Valley. "It is presumable," says Wood, "that in his wanderings after his cattle or game he became familiarized with the locality, and from the summit of one of the adjacent *lomas* first cast longing and loving eyes upon the fair vale which bears his name today."

Livermore moved to that "fair vale" in 1835, and devoted himself to the raising of horned cattle, horses, and sheep. At first he

was greatly harassed by Indians, who stole and slaughtered his cattle, and sometimes threatened his family. At such times Don Roberto sought protection at the home of Don José Maria Amador, his nearest neighbor.

In 1839 the Rancho Las Positas of two square leagues was granted to Noriega and Livermore. As afterwards patented in the United States Courts, this rancho contained 8880 acres. Don Roberto acquired Noriega's share of Las Positas, and lived there until his death in February, 1858. He was survived by his wife and eight children. The adobe home built by Don Roberto near Positas Creek remained until 1875, a landmark of the county.

Don Roberto was not a very rich man when he died. In 1859 his estate, according to the books of the County Assessor, was valued at \$28,300. That same year Don José de Jesús Vallejo headed the list of the county's rich men, with a valuation of \$190,050.

During the gold rush Don Roberto played host to many argonauts. Halley, Alameda County's best historian, points out that his home was on the favorite route to the mines. He writes: "Travel, at first, was nearly altogether by land, and the Livermore Pass became one of the principal routes to the mines. The Coast Range was crossed at the Mission, and the road led through Sunol Valley, Livermore Valley, the Livermore Pass, and was across the San Joaquin River to Stockton as traversed by Moraga just after the occupation of San Francisco; thence to Sutter's Fort, at the junction of the Sacramento and American rivers, which soon became the city of Sacramento."

Before gold was discovered in California, Edwin Bryant had published at New York his book "What I Saw in California," the journal of a trip across the continent in 1846 and 1847. This rare book contains the best account of the Livermore home and of the surrounding country.

The Livermore Valley in 1846

By Edwin Bryant

LEAVING Dr. Marsh's about three o'clock, P. M., we traveled fifteen miles, over a rolling and well-watered country, covered generally with wild oats, and arrived at the

residence of Mr. Robert Livermore just before dark. We were most kindly and hospitably received, and entertained by Mr. L., and his interesting family. After our mules and baggage had been cared for, we were introduced to the principal room in the house, which consisted of a number of small adobe buildings, erected apparently at different times, and connected together. Here we found chairs, and for the first time in California, saw a side-board set out with glass tumblers, and chinaware. A decanter of *aguardiente*, a bowl of loaf-sugar, and a pitcher of cold water from the spring, were set before us; and being duly honored, had a most reviving influence upon our spirits as well as our corporeal energies. Suspended from the walls of the room were numerous coarse engravings, highly colored with green, blue, and crimson paints, representing the Virgin Mary, and many of the saints. These engravings are held in great veneration by the devout Catholics of this country. In the corners of the room were two comfortable-looking beds, with clean white sheets and pillow-cases, a sight with which my eyes have not been greeted for many months.

The table was soon set out, and covered with a linen cloth of snowy whiteness, upon which were placed dishes of stewed beef, seasoned with *chile colorado*, *frijoles*, and a plentiful supply of *tortillas*, with an excellent cup of tea, to the merits of which we did ample justice. Never were men blessed with better appetites than we are at the present time.

Mr. Livermore has been a resident of California nearly thirty years; and having married into one of the wealthy families of the country, is the proprietor of some of the best lands for tillage and grazing. An *arroyo*, or small rivulet fed by springs, runs through his rancho, in such a course that, if expedient, he could, without much expense, irrigate one or two thousand acres. Irrigation in this part of California, however, seems to be entirely unnecessary for the production of wheat or any of the small grains. To produce maize, potatoes, and garden vegetables, irrigation is indispensable. Mr. Livermore has on his rancho about 3500 head of cattle. His horses, during the late disturbances, have nearly all been driven off or stolen by the Indians. I saw in his corral a flock of sheep

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JULY, 1925

No. 3

THE importance to general health of cultivating a habit of water-drinking was the subject recently of several articles contributed by Al Williams, an expert conditioner of men, to the *San Francisco Bulletin*.

"The kind of water you drink plays an important part in keeping you in good physical condition," writes Mr. Williams.

"In San Francisco we are very fortunate. The Spring Valley water is one of the best of any city. I can vouch for this, as I have traveled practically in every large city of the United States, and the water here is certainly appetizing and enjoyable and healthful.

"Any doctor will tell you that many of our ills and physical depressions are caused through lack of drinking enough water.

"It is important to drink a certain amount of water, just the same as it is important for you to eat, breathe fresh air, and exercise.

"There are many theories as to when one should or should not drink water. Personally, I follow the dictation of the feeling of thirst, and I drink water at any time I feel the need of it, at meals or at any other time when the inclination and suggestion demand it.

"I have heard people say that fat people should not drink a great deal of water. I have analyzed this theory, and found that by drinking more water and eating less, doing more exercise, one can reduce very safely and bring the body to a natural physical condition.

"It is claimed that the body is composed of sixty per cent water. A great deal of the water in the body is from the foods we eat; so for the life of me I cannot quite understand how water can be harmful when it is used in moderation and common sense, at any time, regardless of the condition of the individual, provided, of course, that he has a desire for it."

SINCE Wallace Irwin popularized the English of "the Japanese schoolboy," there have been many examples of the weird Nipponese distortion of our mother tongue, but not all of them have been genuine. The following letter is vouched for by the always veracious gentlemen of the Water Sales Department:

San Francisco, May 6, 1925

Spring Valley Water Co.

425 Mason St.

Gentlemen:

I believing your co. made mistaken to charge \$2.51 to march 24 by bookkeeper or meter reader because no leaking during the month and at some month your agent came to examination for leaking he also phoned no leaking at all.

also phoned you mistaken that another street some number 611 including letter tells

also phoning your record shows monthly payment average.

I send back your bills the letter to compare. please send bill again I will pay at once after you looked your side, and remain

Yours truly,

S. Tsuchiya

611 Larkin Street.

* * *

"THE water [of Edinburgh] is excellent, though, I'm afraid, not in sufficient quantity to answer all the purposes of cleanliness and convenience. . . . The water is brought in leaden pipes, from a mountain in the neighborhood, to a cistern on the Castle-hill, from whence it is distributed to public conduits in different parts of the city; from these it is carried in barrels, on the backs of male and female porters, up two, three, four, five, six, seven, and eight, pairs of stairs, for the use of particular families."—*Humphrey Clinker*.

* * *

Rainfall in the Bay Region

(Continued from page 10)

the season 1861-1862, and minimum of 7.42 inches, for the season 1850-1851.

According to Alexander McAdie: "The greatest 24 hours' rainfall in San Francisco occurred on January 28, 1881, when 4.67 inches fell. The next greatest was on September 24, 1904, when 3.56 inches fell. The longest rainless period was in 1903, when no rain fell from April 16 until October 9—175 days. In 1911 there was no rain from June 6 to October 1—116 days."

Last year, 1924, with the exception of a hundredth of an inch that fell on August 18, there was no rain from April 4 to October 4—a period of 184 days.

The Livermore Valley in 1846

(Continued from page 12)

numbering several hundred. They are of good size, and the mutton is said to be of an excellent quality, but the wool is coarse. It is, however, well adapted to the only manufacture of wool that is carried on in the country,—coarse blankets and serapes. But little attention is paid to hogs here, although the breeds are as fine as I have ever seen elsewhere. Beef being so abundant, and of a quality so superior, pork is not prized by the native Californians.

The Señora L. is the first Hispano-American lady I have seen since arriving in the country. She was dressed in a white cambric robe, loosely banded round the waist, and without ornament of any kind, except several rings on her small delicate fingers. Her complexion is that of a dark brunette, but lighter and more clear than the skin of most Californian women. The dark lustrous eye, the long black and glossy hair, the natural ease, grace, and vivacity of manners and conversation, characteristic of Spanish ladies, were fully displayed by her from the moment of our introduction. The children, especially two or three little *señoritas*, were very beautiful, and manifested a remarkable degree of sprightliness and intelligence. One of them presented me with a small basket wrought from a species of tough grass, and ornamented with the plumage of birds of a variety of brilliant colors. It was a beautiful specimen of Indian ingenuity.

Retiring to bed about ten o'clock, I enjoyed, the first time for four months, the luxury of clean sheets, with a mattress and a soft pillow. My enjoyment, however, was not unmixed with regret, for I noticed that several members of the family, to accommodate us with lodgings in the house, slept in the piazza outside. To have objected to sleeping in the house, however, would have been considered discourteous and offensive.

September 18.—Early this morning a bullock was brought up and slaughtered in front of the house. The process of slaughtering a beef is as follows: A *vaquero*, mounted on a trained horse, and provided with a lasso, proceeds to the place where the herd is grazing. Selecting an animal, he soon secures it

by throwing the noose of the lasso over the horns, and fastening the other end around the pommel of the saddle. During the first struggles of the animal for liberty, which usually are very violent, the *vaquero* sits firmly in his seat, and keeps his horse in such a position that the fury and strength of the beast are wasted without producing any other result than his own exhaustion. The animal, soon ascertaining that he cannot release himself from the rope, submits to be pulled along to the place of execution. Arriving here, the *vaquero* winds the lasso around the legs of the doomed beast and throws him to the ground, where he lies perfectly helpless and motionless. Dismounting from his horse, he then takes from his leggin the butcher-knife that he always carries with him, and sticks the animal in the throat. He soon bleeds to death, when, in an incredibly short space of time for such a performance, the carcass is flayed and quartered.

Leaving Mr. Livermore's about nine o'clock, A.M., we traveled three or four miles over a level plain, upon which immense herds of cattle were grazing. When we approached they fled from us, with as much alarm as herds of deer and elk. From this plain we entered a hilly country, covered to the summits of the elevations with wild oats and tufts or bunches of a species of grass, which remains green through these hills, and more sumptuous grazing they could not desire. Small streams of water, fed by springs, flow through the hollows and ravines, which, as well as the hill-sides, are timbered with the evergreen oak and a variety of smaller trees. About two o'clock, P.M., we crossed an *arroyo* which runs through a narrow gorge of the hills, and struck an artificial wagon-road, excavated and embanked so as to afford a passage for wheeled vehicles along the steep hill-side. A little farther on we crossed a very rudely-constructed bridge. These are the first signs of road-making I have seen in the country. Emerging from the hills, the southern arm of the Bay of San Francisco came in view, separated from us by a broad and fertile plain some ten or twelve miles in width, sloping gradually down to the shore of the bay, and watered by several small creeks and estuaries.

We soon entered through a narrow street the mission of San José, or St. Joseph.

The Pleasanton Race Track

By William Whalen

IN 1874 the Spanish landowners in the Livermore Valley were still in possession of a fair amount of their landholdings, viz: the Bernalns, the Livermores, the Sunol family; but the Amador family and the Alviso family had parted with their possessions.

The Indians on the Sunol Road at what was known as the "Rancheria," were very numerous at that time. They had picnics and dances, and they also had a *temescal*, a large excavation in the ground something like the Turkish bath; but now the Indians are all gone except about three that I know of.

The land at that time was held principally by the Bernalns and Samuel B. Martin. Abijah Baker held nearly all the land on the south side of the road from Santa Rita to Dublin, reaching as far south going to Pleasanton as the Joe Black Ranch, which in 1889 was purchased by Mr. E. R. Lilienthal, the hopman.

The Pleasanton Race Track, and all the land around it, and the east side, where Pleasanton now stands, were held by the Bernalns; also the Rose Hotel, which was quite a summer resort in those days. The Bernalns held the place on the Hill Road on each side of the large creek, including the Hearst Ranch, where the Hearst home building now stands, and nearly all the land around that place. The Pleasanton Race Track was the property of Fred Bernal; then came Andy Patterson, who leased the track. The track was built about 1877, and there were good entertaining races every little while. Then came Monroe Salisbury, who bought the track. Abijah Baker bought all the Samuel B. Martin property in the year 1881. During the time Monroe Salisbury had the Pleasanton Race Track there were large matinees attended by high-class racing sports of Oakland, San Francisco, and from Marin County and Santa Clara County; in fact, they came from all over. The matinees were held on Wednesday, Saturday, and Sunday. People came from all over to see some of the best horses in the world step the mile exhibition, guided by some of the greatest drivers in the world. There were such

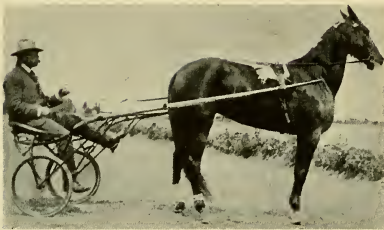
high-class drivers as Charles De Ryder, Millard Sanders of Lou Dillon fame, Al Schwartz, Henry Smith, Henry Sanders, a brother of Millard, and the great old driver Ben Walker, and John McConnell, known as "Buster," who gave the great Sidney his record, and trained many of his colts both in Pleasanton and the East, and all over. And there were such trainers as Lee Shaner, McHenry, George Starr, Jim Dustin, and Ben Chaboya, and the great old driver James Sutherland, and his son-in-law, Fred Chadbourne, and Dick McMahon of Chicago, Dick Wilson and his son, Louis Wilson, and also the noted driver Kelley, who trained and drove the great Directum (record, 2 min. 4 sec.). He was owned by the late John Green of Pleasanton Valley.

Monroe Salisbury had seventeen well-bred mares and the great stud Director. He was sire of Little Direct, foaled at the race-track, trained by Andy McDowell, and later bought by Butler, millionaire merchant of New York. Directum, the great colt by Director, owned by the late John Green of that valley, held the world's record for some years. Also, the great dark-brown stud called Directwell, owned by Mr. Cunningham of Hayward, was raced there. These horses were all foaled, conditioned, wintered there, and raced on the grand circuit in the East in the summertime.

I can only recall a very few of the many hundreds of high-class race-horses, such



The great Directum (2:04) was owned by John Green of Pleasanton. He was trained and driven by Kelley, a horseman prominently identified with the Pleasanton track



Lou Dillon, the first two-minute trotter, with Millard Sanders of Pleasanton driving. This great chestnut mare was by Sidney Dillon, dam Lou Milton by Milton Medium

horses as Flying Jib (2:02), Nancy Hanks, Little Albert, owned by Bradbury of Corte Madera, Mack Mack, owned and trained by the high-class trainer Henry Helman, now manager of the Salinas Race Track. The Pleasanton Race Track at present has some very good race-horses in training—racers, trotters, and high-class runners.

The Santa Rita Stock Farm, formerly owned by William and James D. Whalen, has been used for raising and breeding fine horses for about thirty-two or thirty-three years. Previously it was used for farming and dairying.

W. O'B. Macdonough, owner of the great horse Ormonde, which had won the English Derby and for which Macdonough paid \$150,000, had it on a lease for seven years; then it came back to Mr. Whalen, and a boarding, breeding, and pasturage farm was continued from the year 1900. Some of the first horses that came to live there were those owned by Butler of New York—the great stallion Little Direct and eighteen fine broodmares and some high-class colts. The same month came Stice Brothers with about sixteen mares. The Stice string of horses came from Illinois. They also had two celebrated studs and some other young horses, and the next year the great stallion Stam B., the great son of Stamboul. They came to the Santa Rita Stock Farm with about forty mares, and stayed about three years. I also had the stallion Strathway, owned and managed by Major Sven Christenson. I also had Horacio, the great son of the great Midlothian.

The place on the southwest, just outside the fence of Santa Rita Stock Farm, was known as the Count Valensin Stock Farm, also known as the De Lopez Farm, now owned by Major Sven Christenson. This is

and has been for many years the home of many fine well-bred horses, such as Sidney, Shamrock, also the great running colt Articulate, raised and owned by Mr. Ramon de Lopez—one of the greatest and gamest little horses of its size known. I can remember about fourteen good straight victories to his credit before he met with an accident which caused his death, and could write endlessly on fine horses, colts and mares, raised on and around my farm. I may mention the Bondsman and also Highland C., two splendid horses owned by Captain McCann of Hood River, Oregon; also Lecco, owned by Ed Mills, and Alconda J., owned by Henry Helman.

The Santa Rita Stock Farm is now owned and managed by Charles A. Hartwell of Honolulu, a gentleman of great wealth and love for fine horses—the very kind of man we need to promote the industry of horse raising and racing. He has at present a great many fine mares and colts, and also the great stallion War Shot, which horse he purchased from Major Sven Christenson. War Shot came to my farm about five years ago. He certainly is a great sire and producer of fine game colts, with good speed and wonderful endurance. His colts have shown up wonderfully for their age; they seem to bring home the flour in the barrel and the bacon cooked.

The climate at Pleasanton is particularly adapted to the raising of fine horses; it has the coolness of the coast without the warmth of localities lying farther east. The ocean breeze is broken and moderated by the surrounding mountains. There are no mosquitoes, and practically no flies. There is a variety of natural grasses, green in the valley practically all the year round. The natural grass is also wonderful for dairy purposes. Alfalfa grows well. The water in the valley is most excellent. It can be pumped from the black gravel strata without boring to a very great depth. This gravel acts as a filter for the water, and it is very pure and cold. This is without doubt an important factor in the conditioning of live-stock in this locality. The soil is mostly of a deep sediment, and extremely fertile. Climate, feed, and water are the main elements that have made this locality what it is, one of the most noted spots in the world for the breeding and training of fine horses. The Pleasanton Race Track is conceded to be the best winter track in the world.

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WHEN WE ASKED THE
CAPTAIN (DON JUAN DE
AYALA) IF IT SEEMED
LIKE A GOOD PORT, HE
ANSWERED, "IT IS NOT
A PORT, BUT A WHOLE
POCKETFUL OF PORTS IN WHICH A GREAT
MANY SQUADRONS COULD ENTER
TOGETHER WITHOUT ONE BEING DIS-
COVERED BY THE OTHER, EXCEPT THAT
THEY WOULD SEE ONE ANOTHER WHILE
ENTERING OR GOING OUT THROUGH
THE NARROW ENTRANCE."

PALOU'S LIFE OF JUNIPERO SERRA

SAN FRANCISCO water



“AN UNUSUAL RAIN”

Again!
Another day of rain!
It has rained for years.
It never clears.
The clouds come down so low
They drag and drip
Across each hill-top's tip.
In progress slow
They blow in from the sea
Eternally;
Hang heavily and black,
And then roll back;
And rain and rain and rain,
Both drifting in and drifting out again.

They come down to the ground,
These clouds, where the ground is high;
And, lest the weather fiend forget
And leave one hidden spot unwet,
The fog comes up to the sky!
And all our pavement of planks and logs
Reeks with the rain and steeps in the fogs
Till the water rises and sinks and presses
Into your bonnets and shoes and dresses;

And every outdoor-going dunce
Is wet in forty ways at once.

Wet?
It's wetter than being drowned.
Dark?
Such darkness never was found
Since first the light was made. And cold?
O come to the land of grapes and gold,
Of fruit and flowers and sunshine gay,
When the rainy season's under way!

And they tell you calmly, evermore,
They never had such rain before!

What's that you say? Come out;
Why, see that sky!
Oh, what a world! so clear! so high!
So clean and lovely all about;
The sunlight burning through and through,
And everything just blazing blue.
And look! the whole world blossoms again
The minute the sunshine follows the rain.
Warm sky—earth basking under—
Did it ever rain, I wonder?

CHARLOTTE PERKINS STETSON

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*The Public's Use of Lands Devoted to Its Service**By S. P. Eastman, President*

THE operative properties of a public utility, as the name suggests, are devoted to the public use in providing one or more of the services essential to life, industry, and agriculture. Such properties often include substantial and important landholdings necessary in the development of the particular service in which the utility is engaged. This necessity of use is the paramount necessity, and while other uses may not be, and frequently are not, inconsistent with the public or utility use, any additional use must be subordinated to that highest or public utility use.

Spring Valley Water Company owns large holdings of various classes of land necessary for the gathering, impounding, and delivering of water to San Francisco. When no injury can arise to the various water uses of its lands this Company has been desirous of enabling the public to enjoy the privilege of using its properties in the many ways that land peculiarly adapted to public enjoyment may reasonably permit.

Prompted by this desire the Water Temple at Sunol was built, so that one-half of the city's supply, which passes through the Temple, may be observed; and a natural picnic and play ground was also opened up within the shadows of the Water Temple.

The Niles Canyon below Sunol is one of the outstanding places of beauty near the transbay cities, and, as the water supply is diverted above the canyon, the Company has provided that it be developed and opened up

for its length of five miles to camping and picnic grounds for the public to enjoy.

In a similar way picnic grounds are made available to the public on the beautiful Polhemus property near San Mateo.

This plan of inviting the public to use and enjoy lands devoted to water-supply purposes has greater possibilities. The extent depends on the appreciation of the public as evidenced by its co-operation. Such co-operation must be both individual and collective, and in its collective aspect it should find responsible leadership in the various public agencies, such as the State and Municipal Boards of Health, Park Commissions, Game and Police authorities, and County Legislative bodies.

The public, in developing this responsible co-operation through its public agencies, can make it practicable to extend the public's enjoyment of lands which first must discharge their duties in developing their function for public service. Violators of public privileges, while few in proportion to the total which may enjoy privileges, nevertheless are many in the aggregate, and this again emphasizes the need of responsible aid from the proper officers representing the public.

Under an arrangement of adequate protection, a plan might be developed for the creation of public parks and playgrounds on areas contiguous to reservoirs situated on the tops of various hills throughout San Francisco. Similarly, the vast tract of land constituting the watershed properties of the Peninsula might be made a game refuge.



A nook in the peninsular paradise that Spring Valley has gradually been developing into country homesites

Peninsular Beauty-Spots

By Theodore J. Wilder, Manager Real Estate Department

MANY years ago Spring Valley Water Company acquired several hundred acres in Portola Valley for the purpose of increasing San Mateo County sources of San Francisco's water supply. As it was later determined that this land would not be necessary for water-supply use, the Company decided to make it available to those seeking country homesites.

The natural attractions of Portola Woods (as this acreage was named) are so varied that they offer an inviting opportunity to the purchaser to develop according to his own tastes an ideal small "country estate" within an hour's run of San Francisco.

Adjoining it on the south is the beautiful "Family Farm," the playground of a prominent San Francisco club; and within a quarter of an hour's run is Stanford University, with its red-roofed Spanish-type buildings set in extensive grounds, which offers world-famous

educational advantages as well as varied amateur sports. For the golf-lover the Menlo Park golf-course near by offers a splendid opportunity for play.

The land is beautifully wooded and rolling, and so located that it is well protected by the mountains to the west from the fog and winds to which the coast is exposed, giving a mild, even climate. A more beautiful background could not be imagined than these Santa Cruz Mountains, with their wooded hills, always green, with blue shadows and marvelous cloud effects. The natural growth embraces a great variety of trees: the stately redwood, the pine, the spreading oak, the aromatic bay, the eucalyptus, and the red-branched madrone. The California toyon, with its popular red berries, and the manzanita and other wild shrubs grow thickly. In the spring the meadows are carpeted with wild flowers. All



Following Portola Woods, the West Union and Polhemus tracts are Spring Valley holdings destined for complete development and residential subdivision

these combine to give delightful surroundings and background for the outdoor life for which California is famous.

The country is rich in lore of early California history. Don Gaspar de Portola passed through the valley on quest of a navigable harbor on the coast, and made camp near by. All the early explorers were enchanted by the natural beauties of this district.

Great care was exercised in the subdivision of this tract so that none of its natural beauties might be lost or marred, with the result that Portola Woods has become one of the most desirable suburban properties within a radius of fifty miles of San Francisco. This statement is substantiated by the fact that the major portion of the property has now been sold to twenty-eight individual purchasers, in parcels ranging from five to forty acres in size, the new owners being enthusiastic over the possibilities presented for country-home building and landscape gardening. Water is supplied by a local company to care sufficiently for all needs.

Improvements have been completed on

several holdings which indicate an effort to harmonize construction of houses, gardens, walks, and roads with natural contours. The remaining owners contemplate building permanent homes in keeping with preceding development, so that Portola Woods will beyond question prove an artistic addition to the Woodside district.

The West Union and Polhemus tracts are two other large holdings of the Company remaining unsold on the Peninsula. Consideration is now being given to the development and sale of these parcels.

The West Union property consists of approximately 1322 acres, and lies about four miles west of Belmont, adjoining the southerly end of Crystal Springs watershed. This land is hilly and thickly grown with the same variety of trees as Portola Woods. On the west its wooded hillsides rise to meet the newly completed Skyline Boulevard, the beautiful scenic drive from San Francisco to Santa Cruz, which marks its western boundary. The general character of this parcel lends itself chiefly to large country estates



This charming patio graces the home of Mrs. Caroline Houser in Portola Woods

and villa sites. It differs distinctly from Portola Woods in that it has more rugged aspects, but enjoys the same freedom from fogs with consequent mildness of climate. The contrasts in topography are many, and its elevation gives a wonderful panorama of the peninsular plain and the southern end of San Francisco Bay.

The Polhemus tract, which lies about four miles west of San Mateo and south of San Mateo Creek, comprises about 850 acres. A well-paved road leaving the State Highway at San Mateo traverses the property in such

a way as to leave approximately half the total acreage on either side of it. The westerly portion is hilly and beautifully wooded. Height and hollow are here pleasingly combined; there are clearings and wooded spaces. The easterly portion, while not so wooded, has great charm in its rolling hills and beautiful outlook.

The entire property is especially desirable for subdivision in fairly large parcels. It offers the purchaser rustic seclusion, in spite of its advantageous proximity to centers of population.

The Lost Village of Searsville

INTIMATELY connected with beautiful Portola Woods is Searsville Lake, which covers a broad expanse of former valley land between Stanford University and the Mountain Home Road that runs from Woodside into Portola Valley. Searsville, like Crystal Springs, Pilarcitos, and San Andreas, is an artificial lake created many years ago for water-supply purposes.

About 1887 Spring Valley Water Company planned the construction of a tunnel

24,500 feet long, from San Francisquito Creek to Crystal Springs Reservoir for the purpose of conveying the waters of the creek to the reservoir, and thus augmenting the storage there. This plan was later abandoned, and in its stead a dam was projected at Searsville together with a pipe-line that would carry five million gallons of water daily to the Belmont Pumping Station, whence the water would flow into San Francisco. The original idea was to carry the

dam to a height of 105 feet. It was built in 1891 to a height of fifty feet, giving a reservoir capacity of 329.5 million gallons. The Searsville (or Portola) Reservoir, (it is known by both names), was not further developed, and was never connected with the Spring Valley system.

Prior to the construction of the dam Spring Valley had of course acquired a very large acreage. Only the old-timers in that section of San Mateo County can visualize what happened when Spring Valley proceeded to clear the projected reservoir site. To know at second hand that there was a flourishing village where Searsville Lake now spreads its placid waters is not the same by any means as to have seen the village itself, as imagination is slow in these matters to supply an adequate picture from no matter how complete a description.

A flourishing village indeed was Searsville, born of the lumber business of that region. It had its day of prosperity and high life, and then, to quote Miss Lois Leary of Redwood City, who has prepared a paper on its history, and kindly placed it at the disposal of SAN FRANCISCO WATER: "It passed out of existence as completely as if swallowed

up by the sea." The end came about thirty-five years ago, and today, doubtless, there are many living in that beautiful region who have never heard of such a village existing.

To quote Miss Leary:

"In the late '40's there came to this part of San Mateo County a sturdy band of pioneers who saw in the immense redwood forests that covered the mountain and the eastern valley great promise for a lumber industry. They built crude mills and manufactured lumber and shingles. Hundreds of the largest trees were in or close to Searsville, and so the site of the village was fixed. The woodsmen built homes there for their families. Hotels and stores followed. Then came the school, and by the middle '50's Searsville was firmly established and gave promise of becoming a town of importance.

"As the years wore on, lumber-making facilities improved and increased, and soon great forests of redwood giants had disappeared, and one by one the mills closed down until none was left. Despite this serious setback, the old village lived quite prosperously out of the farming industry that took the place of the lumber trade.

"It was in 1890 that Searsville was given



Natural and architectural beauty go hand in hand in Portola Woods. This is the home of Mr. Norward B. Smith



The luxuriance of tree and flower typical of Portola Woods is strikingly illustrated in the home of Mr. Paul Fay

its death-blow. Spring Valley Water Company conceived the plan of storing the water of the streams near the village, and, by means of a tunnel, diverting it to Crystal Springs Lake west of San Mateo. The land of Searsville was purchased from its owners and work was begun on a concrete dam near the town.

"In the following year, when the water backed up against the dam and began to flood the adjoining low lands, the good folk of Searsville realized that it was time to move. They made good use of the short time at their disposal, and inside of a week not a single house was left in Searsville. Some were demolished, some were moved away, fences were torn down, gardens were uprooted, and when the work of destruction was complete there was hardly a vestige left of the lively old village."

From an article contributed to the *San Mateo Times-Gazette* in 1891 further information about the town of Searsville is to be had. The article was written by James J.

Swift, a most respected citizen of San Mateo, and a prominent figure in the political and journalistic life of the county. Mr. Swift, as a cub reporter on the *Times-Gazette*, drove from San Mateo to Searsville at the end of October, '91, to see the curtain rung down on the village. He wrote:

"When a reporter of the *Times-Gazette* drove over that way yesterday all was bustle and activity. It looked as if the water would come up inside of twenty-four hours from the way that houses and barns were being torn down and fences removed. On the road just this side of Searsville was a small frame house mounted on a sled, drawn by six horses, slowly working its way toward high ground. This house was formerly owned by Charles McLaughlin, and was purchased from the water company by Harry Cutter, who conducts a saloon around the turn below Eikerenkotter's. A respectable frame house could be bought for from \$5 to \$50. A force of men were at work around the Eikerenkotter's store taking it to pieces. The lumber will be

hauled to Redwood City and used sometime in the future in building a house on some lots owned by Julius Eikerenkotter. The hotel will stand and will be used by the water company. George Eikerenkotter will for the present go out of business. It is reported that the post-office will be taken by J. H. P. Gage, foreman for E. F. Preston, and will be located somewhere near the Preston place. The row of pretty cottages below the hotel has been torn down, the fences taken away, and the ornamental trees and shrubs and fruit trees removed. As the road leading from Eikerenkotter's Hotel and store toward Preston's will be partially submerged, a force of men has been engaged in laying out and building a new road from the hotel across the fields, which will join the old road near the foot of the mountain.

"Three or four old-timers gathered near the hotel and mournfully gazed on the work of demolition, and as each familiar old landmark gradually faded away they became reminiscent, and the yarns they told of the life and bustle of that lively little burg of years ago would fill a big book—how the mill-boys used to come into town and spend Sunday afternoons at horse-racing, fighting, and other amusements; of the famous games of poker and the high stakes that were wagered on the races. There was more life in Searsville then than there is now in all of the county. That was when the old men were boys; when dollars were as plentiful as dimes are today and everyone had more than he knew what to do with. But there came a day of degeneration for the little village. When the timber on the eastern slope of the mountains was used up, the mills closed down and their employees departed for other sections of the state.

"There are but few of the sturdy pioneers now alive who first made their homes in Searsville. Among them are William Lloyd, John Sears, William Page and Joe Spaulding of Mayfield, William Smith and Dr. S. S. Stambaugh of San Francisco, Morris Doyle, and some others whose names could not be learned.

"It is said that the first settler there was a man named William Brown, who purchased a portion of the Coppinger grant and called it the Mountain Home Ranch. In July, 1852, John Smith came and resided there continuously up to a few years ago,

when he returned to Sweden, his native land. The next year brought August Eikerenkotter, who started a store, and shortly after the birth of his daughter, Mrs. Klumpp, built the fine hotel that still stands. All of Mr. Eikerenkotter's children, except Charles and Edward, were born and raised at Searsville. John Sears of La Honda came in 1853, and also started a hotel. He afterwards sold out to Moses Davis, father of Alf and Steve Davis. This hotel stood near the bridge below Eikerenkotter's. It was burned a good many years ago. About the same time Denis Martin came and entered largely into the lumber business. The name Searsville was suggested by a journalist who visited the place in 1854 and wrote several articles descriptive of it for the *San Francisco Alta*. William Lloyd came in 1856. He was engaged to come from San Francisco to move one of Denis Martin's mills over the mountain. He concluded to make his home at Searsville, and moved his wife and one child (now Mrs. Townsend) down from San Francisco, and has lived there up to a short time ago. Mr. Lloyd is a blacksmith, and shortly after his arrival started a shop. In 1857 Daniel Ford moved up from Redwood City, also starting a forge, and remained a few days before moving back to Redwood. Mr. Lloyd is full of reminiscences of Searsville's early days and tells many interesting stories of its old residents.

"Among the mills that were run in the vicinity were the Mountain Home mill, Denis Martin's two mills, the Smith mill, the Mastick mill, Spaulding's mill, and Templeton's mill. All of the lumber cut by them was hauled through Searsville, and all of the employees spent their money there, and this was no small item.

"Searsville lost its importance when the mills closed down, but during recent years has attracted the attention of many wealthy people in search of homes, and around it have been built up numbers of beautiful residences. Its hillsides are dotted with trees and vines, and nowhere in the state can be found more attractive scenery or a more healthful climate. The new order of things will rather increase than diminish its attractiveness.

"Vale, Searsville! It is gone with all its pleasant memories and associations, living only in memory."



The interplay of sunshine and shadow was sought and attained in the setting of this Portola Woods bungalow, the property of Mr. Benjamin Bangs

A Fight with a Grizzly Bear

IN 1920 there was privately printed in San Francisco an attractive brochure entitled "A Woodside Reminiscence, as told by Grizzly Ryder." The author was Cutler L. Bonestell.

It is the authentic story of how Bear Creek and Bear Gulch at Woodside received their names. And it is a story that surrounds with a certain glamour of romance the ancient adobe house that still stands on the estate of Mr. John A. Hooper, Woodside. This adobe, built in 1835, is pictured on the cover of this issue of SAN FRANCISCO WATER.

Mr. Bonestell relates his chance meeting with "Grizzly" Ryder in an antique shop in Springfield, Massachusetts. This was in 1914, when Ryder was eighty-two years old. He died in 1917. The nickname came from Ryder's famous encounter with a grizzly, as the result of which he had lost the upper

portion of one ear and had scars all over his body.

Mr. Bonestell tells the story as follows:

I TURNED to Ryder and asked, "What part of California are you from?" He said: "I lived the greater part of my life in California, about thirty miles south of San Francisco, and I will draw a map and show you just exactly where my house was located."

He then took a piece of paper, drew quite an accurate map of the country lying south of San Francisco, and indicated Woodside as the particular locality where he lived. I became interested at once, on account of my own familiarity with that neighborhood, and said that I would like to hear more about his early experiences. As I had ample time, he proceeded to relate the following:

"I enlisted for the Mexican War and after

the termination of that started west for California, with a man named Tripp."

I there interrupted him and said, "Do you mean Dr. Tripp?" whom I had known as a child, living in Woodside, and who had continued to live there until a very few years ago. He said, "Yes, Dr. Tripp," and continued:

"We finally reached California, came to San Francisco, which was then practically a bustling village, and as neither Tripp nor myself cared for city life, particularly as it was then being carried on in San Francisco, and realizing the great demand for lumber of all kinds, we decided to locate south of San Francisco, where lumber was plentiful, and engage in the lumbering business. We settled at Woodside, traveling to that point from San Francisco on horseback. At that time there was but one house between the Mission Dolores and the little town now called Redwood City, which at that time was called the Embarcadero—the name being derived from the fact that the lumber which was cut along the mountains in that neighborhood was hauled to this point, where a slough made up from the bay was located, and was there floated down and finally reached San Francisco. The way we used to float the logs was to tie several together, launch them at the flood of the tide and they would float out with the ebb. We would then anchor them so that the incoming tide could not float them back, and so continue until we had reached the bay. Keeping close to the shore, we followed the same tactics until finally we would land our logs at San Fran-

cisco; at least, those of them which were not lost in transit.

"There were at that time—or at least soon after—five sawmills located within a radius of two miles around Woodside, as there was plenty of redwood timber to be had, many of the trees growing quite a distance into the valley. Tripp and I lived together and employed a gang of men engaged in cutting out piles for some of the San Francisco wharves, which were then being constructed.

"As is well known, that section of the country was much infested with grizzly bears, particularly a little farther south, back of what is now known as Palo Alto. One morning we discovered that a pair of our oxen had disappeared—evidently strayed; and being unable to find any trace of them in the neighborhood of our camp, we concluded that they had strayed south along the base of the mountains, into what is now Portola Valley. There was a rich growth of pasture-grass there, and it would be a natural place for strayed animals to remain. We knew that there were many grizzly bears in that neighborhood, and realizing the danger the animals ran in being unprotected in that district, it was determined to go at once and seek them.

"I started out from the camp in the early morning, with a young Mexican boy, who was to accompany me. As we would have to search over a considerable area, we did not take horses, but traveled along the well-beaten trail on foot. It was agreed between the boy and myself that we should meet at a certain rock which was plainly to be seen



The Mountain Home Ranch was the property of E. W. Burr, a Searsville lumberman. It is now the Folger estate in Woodside. This picture is from Moore and De Pue's *Illustrated History of San Mateo County*, published in 1878.

and well known. The meeting was to be at sunset. We also agreed that if either of us found the oxen, he was to drive them to the camp without waiting for the other, and the remaining one going to the rock, as agreed, at sunset, and the other not arriving, it would be known that the oxen had been found and driven to camp.

"I hunted about all day without success, and finally arrived at the rock about sundown, to await the young boy, and remained there for some time after the sun had set, but the boy did not appear. I naturally concluded that he had found the oxen and driven them to camp, as we had agreed. So, in the pleasant evening air I started along the trail towards camp, and I remember particularly, as I walked along where the trail turns sharply to the west, an enormous redwood tree. I stopped and looked at it and thought that as soon as I had a little time, I would make some money by cutting it into shingles, which were in demand for the quicksilver mines at that time projected at Almaden. I continued along the trail a short distance beyond that tree, where there was an adobe occupied by a Mexican and his family. He also employed an old Indian woman about the premises, and an old sailor who had run away from his ship in San Francisco Bay. The old adobe," Ryder continued, "was built in 1836, and is now the property of a Mr. John A. Hooper.

"I went into the house and sat there chatting for some time when I realized, and finally, as I got up to leave, I noticed, that it was quite dark. There was, however, sufficient light from the young moon still shining over the mountains to make the trail entirely distinct, and I knew that I had not a great distance to walk before reaching our camp at Woodside. As I started to go out the Mexican said, 'Ryder, are you armed?' to which I replied, 'I have my knife, but I have no other weapon; why do you ask?' 'Well,' the Mexican replied, 'you might meet a bear on the trail,' but I said, 'I do not think there is any danger,' so proceeded along the trail on my way home. About half-way between the adobe and our camp was a little stream called, at that time, by a Spanish name which I have forgotten, and where the stream ran across the trail, the ground being somewhat level, it spread out and formed some little pools, and it was at one of those that I intended to refresh myself with a drink of

water. That stream is now called Bear Creek, taking its name from the incident which I am about to relate, and is the present source of supply of the Bear Gulch Water Company.

"I knelt down and took a long, delicious draft of the cool water, and as I looked up I could just see the moon sending its last beams through the redwoods before it set behind the mountains. Realizing that I must hurry, I arose quickly to my feet, and as I did so, I perceived a large object very close to me, which I thought at once was one of the cattle. Lifting my arms, I shouted to it, and before I had time to make any movement, the thing, to my horror and surprise, arose upon its hind feet and grabbed me around the body. I realized that I had met a grizzly bear. Fortunately, the animal was probably as greatly surprised as I was, and grabbed me quite high up about the shoulders, so that my right arm was comparatively free. I at once loosened my sheath knife and proceeded to plunge it into the beast. She then let go and struck me a blow. I say 'she' because even in those moments I realized that there were two cubs about my feet. The blow felled me at once and as the ground sloped sharply away from the mountains at this point, I proceeded to roll down a sort of embankment towards the brush. The bear pursued me, striking at me and biting me; but it was evident that the cubs, who also proffered their assistance, got in her way more or less; otherwise I never would have reached the bottom of the declivity alive. Although suffering great pain, I retained consciousness and thought of that old saying that if one will lie perfectly still, a bear will not molest one; so I made no outcry, but as I reached the edge of the brush, I lay perfectly still. The old bear sniffed at me once or twice, then dealt me a blow with her paw and went away and left me. I lost consciousness and how long I lay in that condition I do not know, but finally became aware of a voice which seemed to be away up in the air, calling my name. I could hear this faint sound, 'Ryder, Ryder!' and just had sufficient strength to make a faint moan in reply. I then fainted again and did not recover consciousness until I came to in the adobe, with those who lived there about me, trying to do what they could to stop the flow of blood.

"It appears that the young lad who went



Eikerenkotter's store and hotel were at the center of Searsville activity in the old days before the village disappeared. The site of these obliterated landmarks is west of the Woodside Road at its intersection with the Menlo Park and Searsville (or Mountain Home) Road

with me in search of the oxen got lost and did not reach the rock where we were to meet until long after sundown. He then hastened along the trail towards the camp and reached the adobe a short time after I had gone on. He left immediately and hastened after me. He had only gone from the house a very short time, when the inmates were surprised to have him come tumbling in through the half-open door saying that he had seen the devil and two bears fighting in the brush. The Mexican realized what had probably occurred and grabbed a lantern to see if he could arrive in time to be of any assistance. It seems that the bears had torn my clothing entirely off, which gave the impression to the young Mexican that he had seen the devil. It is to the arrival of my friend from the adobe that I owe the fact that I am here at all.

"The first step, of course, in my predicament, was to stop the flow of blood, if possible, which was pouring in a stream from a gash in my thigh. The only sure way would be to sew up the wound. The sailor said he had a sail-needle, and if they would give him some string he would sew it up. The string was found and he proceeded to carry

out what he had proposed. Of course, he sewed over and over, as you would a sail, and each time the needle went in I thought it was going clean through my body and coming out on the other side. Even with his crude implement he made a successful job of it and the bleeding was stopped. In the meantime, the old Indian woman had gone out and found some herbs with which she was familiar, which she proceeded to steep. Some of them were applied as an outside poultice and some of them were made into a tea which I was given to drink. While it seemed impossible that I should live, for a time, on account of the seriousness of my injuries, I gradually began to gain, and so, in time, from having to lie on my back and look at the walls and ceiling, I was able to get into a chair. Never will anything be so beautiful to me as the sight of the redwoods which I could see through the window the first day I was able to leave my bed. The constant care of those who had so kindly undertaken the burden of my sickness gradually caused me to improve, and shortly I could, without assistance, hobble from the bed to a chair in one of the other rooms.

"One day, while I was sitting enjoying

the scene through the window, a knock came at the door and in walked a man with a small box under his arm. He said, 'I am looking for a man named Ryder.' I replied, 'That is my name; what do you want?' He said, 'I am a doctor from San Jose. Some men in a logging-camp wrote and told me there was a man here who needed attention and asked me what my charge would be for coming out. I told them, they sent the money, and here I am. I want to look you over.' I told him I would be very glad to have him do so, and he proceeded to make an examination of my wounds. After he got through, he said, 'If I had not seen you alive, I would not believe that it was possible. I find you in very good condition with the exception of that leg, which, owing to the injury of the thigh and the impossibility of your receiving proper medical attention, will have to come off, and I shall proceed to amputate it at once.' I said, 'Well, Doctor, this is a great surprise and shock to me and I wish you would give me half an hour to think the situation over and prepare myself, and if you will go into the other room where the family are, and give me that time, I shall be ready for you.' I made up my mind at once that I was not going to submit to any operation. If I was going to live, I was going to live; and if I was going to die, I was going to die; but in either case it would be with all my arms and legs. I realized, however, that I was helpless and could not prevent the doctor from doing what he thought was necessary, so I attracted the attention of one of the children playing outside and when the lad came in I told him to take a horse and go

up to the camp and tell two men whose names I gave him to come at once and bring their guns with them. As you can well understand, we had various kinds of people in our camp and some of them were rather desperate. The two I had sent for were desperadoes, but very good friends of mine. It was a great relief to me when I heard the sound of horses outside and the two men came in. I told them the circumstances; that I did not want to be operated on; that I would not have my leg amputated, and I wanted them to insist (by force, if necessary) upon the doctor's going away and leaving me alone. They said they would do as I wished in the matter. I then called out and told the doctor I was ready to see him, and when he came in I told him I would not be operated on. He said, 'Yes, you will; you'll do as I tell you.' I said, 'No, I will not. My mother's son is not going to either live or die without all the arms and legs which God originally gave him, and here are two friends of mine who are going to see that you do as I tell you.' The doctor looked at the two men and they said yes, that I was right. He saw at once that it would be useless to use either force or argument. He then said, 'Well, if you want to be a damn fool, you will die, and that's the end of it. I have done what I agreed to and I am through.' He then went out and mounted his horse, and that was the last I ever saw of him.

"I continued to improve, though slowly; gradually recovered entirely, and while I have only half an ear on one side of my head, I still am hale and hearty, and would be happy if I could go back to California."

"*De Aquis Urbis Romae*"

By George E. Tonney, Engineering Department

ABOUT midway between Rome and Naples, in a picturesque country abounding in history and traditions, stands the monastery of Montecassino. For centuries it has been on the natural line of communication between the north and the south, and, between intervals of tranquillity, it has had to suffer at the hands of invading armies. In the fourteenth century alone it was sacked three times.

Long has Montecassino been renowned

for its unique and valuable collection of manuscripts. So it happened that in the year 1400, Poggio Bracciolini, in search of works of ancient writers, visited the monastery, and was rewarded by the discovery of numerous codices of the greatest importance. His most important find was an original manuscript in two books entitled "*De Aquis Urbis Romae*," written thirteen hundred years previous by one Sextus Julius Frontinus, Water

(Continued on page 13)

SAN FRANCISCO WATER

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SAN FRANCISCO, CALIFORNIA

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OCTOBER, 1925

No. 4



Charles I. Gavin

THIS Company lost a beloved and efficient official when Charles I. Gavin, manager of the collection department, died on September 11, 1925. The sorrow caused throughout the Company by Mr. Gavin's death was intensified by the fact that he passed away at the early age of thirty-nine years.

Mr. Gavin had been in the Company's service for sixteen years, starting as a counter clerk. In 1922 he married Miss Margaret Howell, their romance having started when Miss Howell was employed by the Company as a cashier.

Mr. Gavin was quiet, unobtrusive, and had an unusual talent for handling details of organization and operation. As an official no less than as a friend he is deeply missed by his associates.

When Mr. Gavin found it necessary to take a leave of absence last May, his illness caused very deep concern, and it is evidence of the sincere affection in which he was held that the company personnel from the president down kept close watch upon his condition.

* * *

"De Aquis Urbis Romae"

(Continued from page 12)

Commissioner of Rome, appointed to office in the year 79 A.D. As the title of the work implies, it is a treatise on the aqueducts of ancient Rome.

The "De Aquis" is a unique manuscript in the sense that at the time of its discovery no other manuscript of the work was known, nor has any come to light since. The work consists of fifty-one pages of closely written matter, perfectly legible after the passage of centuries.

Our knowledge of ancient institutions is gathered not so much from formal writings, but rather by piecing together isolated and often conflicting testimony, drawn from writers of different ages, races, temperament, degrees of knowledge and credibility. How interesting it might be for our present-day discussions if people of other ages had left us chronicles of their political and religious institutions, club activities, poetry, music, decrees of fashion, cosmetics, cooking recipes, social entertainments, and other topics for the edification of our knowledge and curiosity. That Frontinus left us just what we want to know was recognized by Bracciolini 525 years ago. The value of the "De Aquis" is determined by the fact that it is about the only work of its kind in existence.

The treatise is very concise, but definite in detail. It gives the history and description of the Roman water system, its construction and condition; states how much water is used for fountains, state uses, private uses and grants; gives the sizes of taps; tells how the water is measured; and gives rules of maintenance. The completeness of the report is indicated by the introduction, a portion of which reads as follows:

"That I may not by chance omit anything which is necessary for the understanding of the whole subject matter, I will first put down the names of the waters which are brought to the city of Rome; then by what persons, and under what consuls, and in



Claudia and Anio Novus of the great Roman water system, with the Alban Hills in the background. Claudia was built of dimension stone; Anio Novus, on top of it, of small stone and concrete

what year since the founding of the city each of them was brought in; then at what places and at what milestones their aqueducts commence; how far they were carried in underground channels, how far on masonry substructures, and how far on arches;—what is the law with regard to the construction and maintenance of the aqueducts; what penalties enforce it under the laws, votes of the Senate, and Imperial edicts that have been enacted.”

Frontinus split his workaday hours in three ways—supervising the maintenance of the system, writing reports, and combating crookedness. Toward this last he had the attitude of a true investigator, ferreting out theft and correcting abuses and mismanagement. Obviously his predecessors had been men of questionable honesty, and, through negligence, the system was in default.

When Frontinus took office the system was maintained by two labor gangs of overseers, reservoir-keepers, levelers, pavers, and plasterers. The State gang was maintained from revenues from the sale of water-rights. Caesar's gang received its money for lead and construction necessities from the coffers of the Emperor. The two gangs, aggregating seven hundred men, had long since been put

on private work by dishonest foremen. In order to bring about discipline and efficiency, day by day each man was told what to do, and at the end of the day had to put into the record an account of what had been accomplished.

Estates which bordered on the mains acquired water by surreptitiously tapping the channels for their own purposes. Frontinus states: “The amount of water gained by the suppression of this evil may be measured by the enormous quantity of lead pipe we have dug up where we have discovered this illicit commerce.”

We infer that water-rights were sold to individuals who in turn sold and distributed the water to the consumers. The owners of these rights received their water through two sizes of pipe—one seven inches in diameter, the other eight inches in diameter—and they supplied their consumers through four-inch pipe. Here another evil was current, for these water-barons cleverly replaced the seven-inch with one enlarged by ten per cent and the eight-inch by one enlarged by fifty per cent, at the same time reducing the size of the consumers' four-inch pipe. As water was measured by flow, these barons were getting seventy per cent more water

than they were rightfully entitled to. Frontinus refers to these men as "law violators to whom a violation of the law had become a second nature."

There was so much water stolen or wasted, and the methods of measurement and accounting were so uncertain, that Frontinus caused new gauges to be installed and a rigid system of inspection established. By this method he found the capacity of the aqueducts was only 12,700 quinariae against 14,000 supposedly in use by record. In this investigation he found that forty per cent of the city supply was either wasted or stolen.

The materials for repairs to the aqueducts and the expenses incurred had to be borne by the nearest resident. In this respect we can draw on our imagination as to what actually occurred when the bill-collector came around. Referring to repairs, Frontinus states: "Repairs that can be carried on without cutting off the use of waters of the aqueduct consist primarily of masonry work, which should be executed at the right time and conscientiously."

Frontinus was water commissioner at a time when the aqueduct system had nearly reached its fullest expansion, embracing no less than nine aqueducts with over 240 miles of conduits. Acting up to his responsibilities, dispensing justice with propriety and reason according to a high code of ethics, Frontinus excites our admiration. He administered an extensive and intricate system covering many miles of territory, and he did it with sincerity, honesty, and industry.

The Roman water system consisted of eleven aqueducts. The Appia, the first to be constructed, was built in the year 312 B.C. The four most important were the Vetus, 273 B.C.; Marcia, 144 B.C.; the Novus and Claudia, 38 to 52 A.D. The Novus is the longest of all aqueducts, being sixty-two miles in length, and is constructed of brick masonry lined with concrete. The Claudia is built of cut stone of huge dimensions, its noble and impressive arches stretching across the plains of Campagna for some nine miles and reaching a height of 109 feet at the outskirts of the city. The Claudia has a tunnel



Sand and pebble catch-tanks on line of Marcia Aqueduct, near Tivoli. The catch-tanks are of small stone, Marcia of dimension stone

three miles in length, with a cross-section of three by seven feet. This tunnel was built by hammer and chisel and by building a fire against the heading and throwing water on the hot rock. Part of the present city system is supplied by three ancient aqueducts, which have undergone repairs and restorations. One of the modern aqueducts of the city was built in the year 1585, largely of material from the ruins of the Claudia.

One aqueduct received its supply north of the city, the others from the east and the southeast. The Vetus and the Novus secured their supply from the Anio River. The Marcia and the Claudia had their source in springs that flowed an enormous quantity of water. The discharge capacity of the total of these aqueducts is extremely problematical. Estimates and calculations made by different engineers vary from 60,000,000 gallons to 400,000,000 gallons per twenty-four hours. Herschell, an American engineer, makes the estimate of 84,000,000 gallons—54,000,000 used within the city and 30,000,000 without. He calculated that the Claudia and the Novus each could carry 16,800,000 gallons. The daily consumption in the city he put at 20,000,000 gallons, or thirty-eight gallons per inhabitant. In the distribution system the water was supplied through lead, stone, and terra-cotta pipe. Some of the lead pipe was as large as eighteen inches in diameter.

With the decline of the Roman Empire, and with the centuries of spoliation that fol-



Claudia and Anio Novus near Porta Furba. Repairs were done in brick and in a composite of concrete and brick

lowed, the system fell into decay and ruin. Two thousand years have passed, the topography of the country has changed considerably, and seismic disturbances have caused the valley to rise and become distorted. Despite detached ruins covering many miles of territory, engineers are unable to reconstruct the whole system on paper. But Frontinus has assisted us in a fair understanding of it.



The Baths of Caracalla, the largest building in ancient Rome. One of the major problems of Water Commissioner Frontinus was to supply sufficient water for huge establishments like this

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THE NOBLE HOUSE
O' THE MARCIANS,
FROM WHENCE
CAME THAT ANCUS
MARCIUS, NUMA'S
DAUGHTER'S SON, WHO, AFTER
GREAT HOSTILIUS, HERE WAS
KING, OF THE SAME HOUSE
PUBLIUS AND QUINTUS WERE,
THAT OUR BEST WATER BROUGHT
BY CONDUITS HITHER,

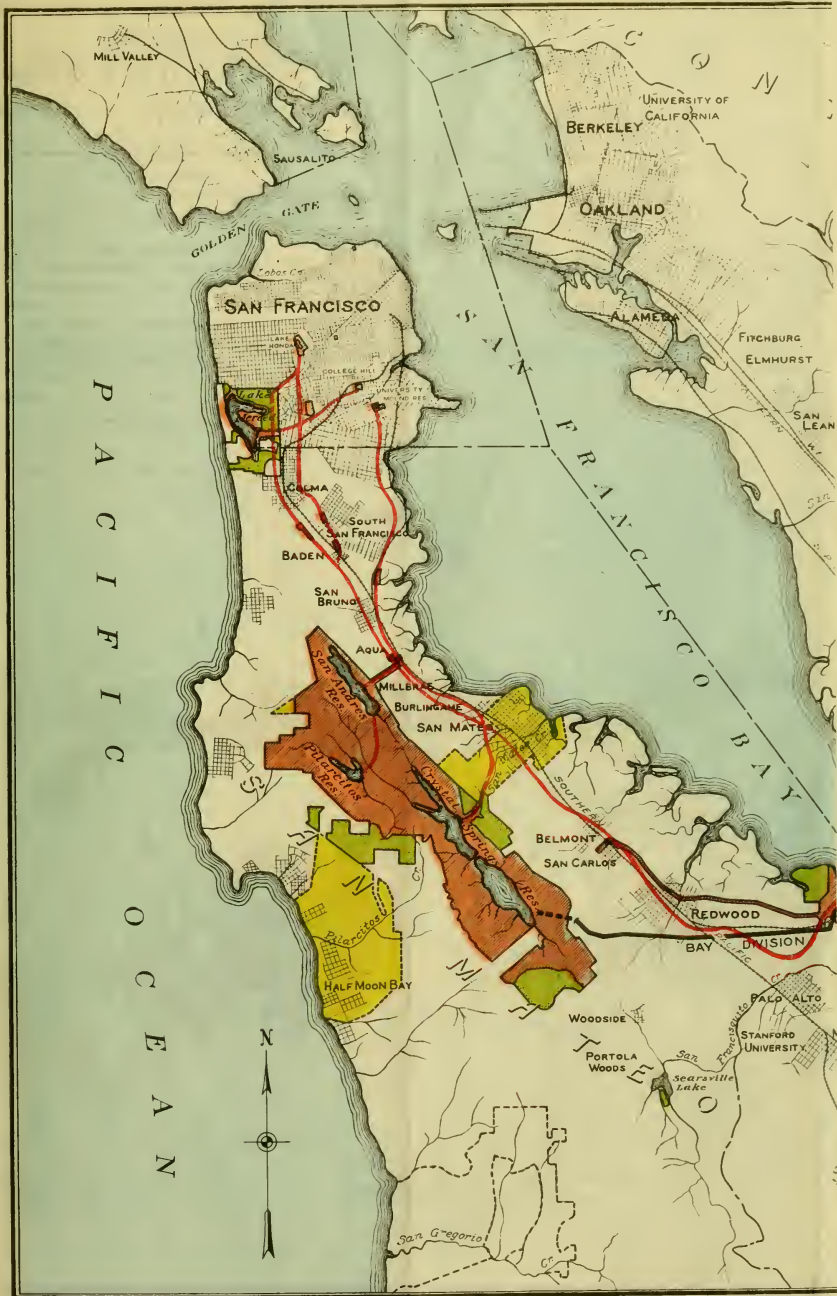
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SAN FRANCISCO
Water





SPRING VALLEY WATER CO

San Francisco-California.

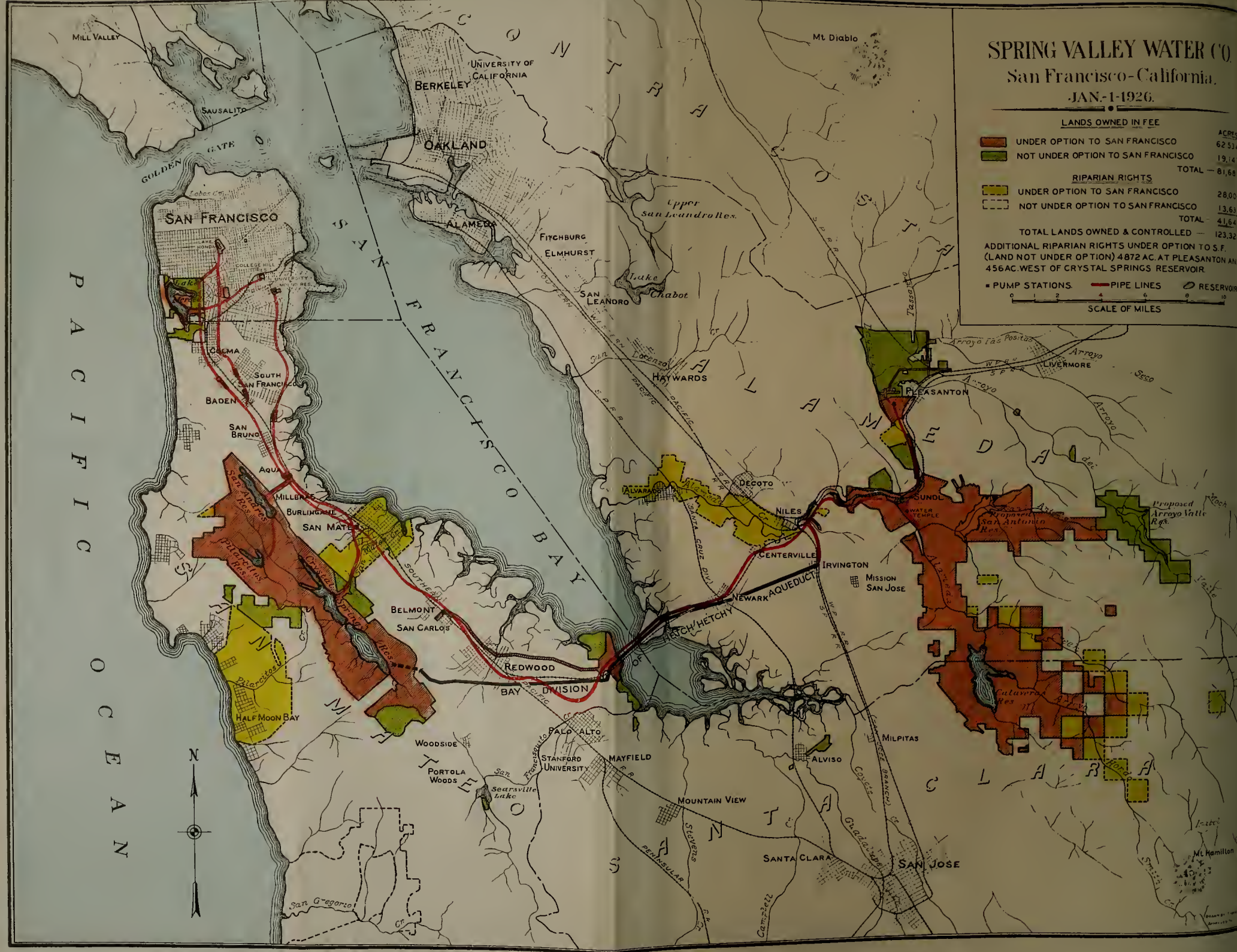
JAN-1-1926.

LANDS OWNED IN FEE		ACRES
	UNDER OPTION TO SAN FRANCISCO	62,534
	NOT UNDER OPTION TO SAN FRANCISCO	19,14
	TOTAL	81,68
RIPARIAN RIGHTS		ACRES
	UNDER OPTION TO SAN FRANCISCO	28,008
	NOT UNDER OPTION TO SAN FRANCISCO	13,633
	TOTAL	41,641
TOTAL LANDS OWNED & CONTROLLED		123,322

ADDITIONAL RIPARIAN RIGHTS UNDER OPTION TO S.F.
(LAND NOT UNDER OPTION) 4872 AC. AT PLEASANTON AND
456 AC. WEST OF CRYSTAL SPRINGS RESERVOIR

PUMP STATIONS.
 PIPE LINES
 RESERVOIRS

SCALE OF MILES



SAN FRANCISCO WATER

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SAN FRANCISCO, CALIFORNIA

VOLUME V

JANUARY, 1926

NUMBER 1

The Water Supply of San Francisco

By George A. Elliott, Vice-President and Chief Engineer

THE city of San Francisco is supplied with water by the Spring Valley Water Company, a public service corporation subject to regulation by the California State Railroad Commission. The developed capacity of the system in 1925 is 66 million gallons daily, and the consumption about 42½ million gallons daily. About 1¾ million gallons daily of this amount is used along the route of the transmission lines outside of San Francisco. The Company owns 81,681 acres of land, consisting of watershed property and land overlying the subterranean sources as well as reservoir sites and that used in connection with the structures necessary for water-supply purposes. In the transmission of water from the sources to the distributing system use is made of 7 miles of tunnels, 13.8 miles of flumes and concrete aqueducts, and 90 miles of riveted pipe ranging in diameter from 30 inches to 54 inches. There are 713 miles of pipe in the city distributing system, supplying 91,000 service connections and 4683 fire hydrants.

The present supply is derived from catchment reservoirs in Alameda, San Mateo, and San Francisco counties, and from wells in the Livermore Valley and infiltration galleries in the Sunol Valley, both valleys being situated in Alameda County. The region in the vicinity of San Francisco is designated as semi-arid, and past experience has proved the necessity for a storage capacity equal to three years' demand in order to continue the supply through the dry cycles which occur with regularity. This requirement, together with the fact that, typical of California streams in this vicinity, all of the run-off

occurs in the winter season of December to April, has made it necessary to build large storage reservoirs. The total storage capacity of the Company is 64,800,000,000 gallons. The Company owns practically the entire drainage tributary to the reservoirs in San Mateo County, the habitation on the drainage being limited almost entirely to its employees, a circumstance of great importance in preventing contamination of the water.

The Peninsula supply, as those sources situated in San Mateo and San Francisco are known, consists of four reservoirs. Pilarcitos Reservoir is situated about midway between the Pacific Ocean and the Bay of San Francisco, about eleven miles south of the city. An earth dam seventy feet high, built across Pilarcitos Creek in the year 1867, impounds the run-off from 5.2 square miles of watershed, creating a lake which holds 1,000,000,000 gallons of water. The dam, with slopes of 2½ and 2 to 1, was constructed as a dry fill, with a puddled-clay core, the earth being spread in thin layers and rolled.

The reservoir is at an elevation of approximately 700 feet above sea-level. The surrounding hills are at a much higher elevation, reaching 1875 feet, and their slopes are covered with a heavy tree and brush growth. The average annual rainfall of 49 inches, the largest precipitation at any point of the water system, usually provides a greater annual run-off than can be stored in the lake, and the surplus is allowed to pass on through tunnels and flumes to either San Andres or Crystal Springs reservoir.

San Andres Reservoir is located in the

next valley to the east of Pilarcitos and about two miles to the north. The dam was constructed in 1868 in the same manner as Pilarcitos, its height being 95 feet. The capacity of the reservoir is 6,000,000,000 gallons, and the average annual rainfall is about 40 inches. The drainage area directly tributary to the reservoir is 8.4 square miles. The run-off from about one square mile of the upper area drained by San Mateo Creek, which is naturally tributary to Crystal Springs Reservoir, is diverted by means of the Davis Tunnel through the ridge to the west of San Andres and finds its way into San Andres Reservoir.

Crystal Springs Reservoir occupies the lower portion of the same valley that contains San Andres, and is about thirteen miles south of San Francisco. It was formed by the construction of a concrete dam 154 feet high, containing 157,200 cubic yards of concrete, built in 1887-90. Crystal Springs Reservoir has a total length of about seven miles, a storage capacity of 22,500,000,000 gallons, and an average annual rainfall of 29 inches. The lake is divided into two parts by an earth dam built three miles from its southern end in 1877, creating the original Crystal Springs Reservoir. The concrete dam was built of interlocking blocks. The blocks are 40 feet long, 8 feet high, and 30 feet wide. Alternate blocks were built in place, and the spaces between them afterwards filled in with concrete in order to minimize the effect of the shrinkage due to the setting of the concrete. The dam was built with sufficient dimensions so that it can be raised in the future without adding to its thickness. This is a very valuable feature, as large storage in the vicinity of San Francisco is very desirable, due to the distance water must be brought to meet the future needs of the city.

The combined average daily production of Pilarcitos, San Andres, and Crystal Springs reservoirs is 18 million gallons.

Lake Merced, in the southwest corner of San Francisco, is a natural lake whose capacity was increased to 2,500,000,000 gallons by the construction of an earth dike about 15 feet high across its outlet. It is situated about half a mile east of the Pacific Ocean, practically at sea-level. Water reaches it through the medium of an average annual rainfall of 23 inches, which falls on the sandy drainage area through which it perco-

lates, finally entering the lake in the form of springs. All surface drainage which might enter Lake Merced is diverted around the reservoir and carried off so as to decrease the danger of contamination. The normal daily productivity is $3\frac{1}{2}$ million gallons.

The Alameda sources are all contained within the drainage area of Alameda Creek, a stream which drains over 600 square miles of watershed located in the Coast Range mountains on the east side of San Francisco Bay. The topography of the area varies greatly, ranging from the flat valleys of Sunol and Livermore, at elevation 220 feet, through rolling foothills to the rugged slopes of Mt. Diablo, Black Mountain, and Mt. Hamilton, at elevation 4209 feet above sea-level. The rainfall varies from a minimum of 15.26 inches at Livermore to 30.50 inches at Mt. Hamilton. Due to the large drainage area, the average annual run-off is 47,000,000,000 gallons. The principal tributaries of Alameda Creek are the Arroyo Honda, draining 100 square miles; Upper Alameda Creek, draining 40 square miles; San Antonio Creek, draining 39 square miles; Arroyo Valle, draining 150 square miles; Arroyo Mocho, draining 38 square miles. The two last-named streams cross the gravel-filled Livermore Valley and are the principal sources of its underground supply. Uniting with other minor streams that flow into Livermore Valley, the Arroyo Valle and Arroyo Mocho form Laguna Creek, through which the run-off flows to Alameda Creek at Sunol. The Arroyo Honda, Upper Alameda, and San Antonio combine to make Calaveras Creek, which crosses the Sunol Valley to join with Laguna Creek, forming Alameda Creek, which flows down Niles Canyon to San Francisco Bay.

Three storage locations are to be found on the principal tributaries of Alameda Creek, one of which has been developed on the Arroyo Honda, and is known as Calaveras Reservoir. It is located about nine miles south of Sunol. An earth-and-rock dam, the lower portion of which was constructed by the hydraulic-fill method, and the upper part with a rolled-clay core supported by loosely placed rock, impounds the run-off from 100 square miles of watershed. The height of the dam is 220 feet above bedrock, and the capacity of the reservoir is 32,800,000,000 gallons. Based on past rec-

ords, the daily productivity at present is 38,200,000 gallons. When the Upper Alameda Tunnel, which is now under construction, is completed, the run-off of an additional 40 square miles of drainage area will be transported a distance of 9700 feet into Calaveras Reservoir.

The San Antonio and Arroyo Valle reservoirs, projected for the future, are situated on the streams of their respective names.

In addition to the surface storage described, the Spring Valley Water Company makes use of two underground sources of supply, known as Sunol and Livermore valleys. The Sunol Valley is a gravel-filled depression with a surface area of 1300 acres, located at the upper entrance to Niles Canyon, through which the entire drainage of the Alameda system of over 600 square miles must pass on its way to the Bay. A low dam at the canyon entrance backs up the water in the gravels from which it is abstracted through an infiltration gallery. Water is taken from the Livermore Valley through the medium of wells ranging in depth from 50 to 600 feet. At the present time 75 wells are equipped with pumping units, which are operated when necessary. The Livermore Valley floor has an area of 35 square miles. Rainfall on an area of 412 square miles supplies the streams which pass through the valley.

In transporting the water from the sources of supply to the city distributing reservoirs the principal medium is riveted pipe. The character of the water as well as the soil in which these pipes are laid is such that deterioration has been slow. A part of the first pipe laid to bring Pilarcitos water to San Francisco was removed only a few years ago after a continuous use of over 50 years. Such flumes as are used are constructed of California redwood, which has a long life, and the tunnels, the longest of which is 7500 feet, are lined with brick or concrete.

Pilarcitos water flows through 4921 feet of tunnels, 5280 feet of wood flume, and 730 feet of 44-inch and 4488 feet of 22-inch riveted pipe into San Andres Reservoir. In the event of an overflow through the Pilarcitos wasteway, a dam about two miles downstream diverts this flow into a conduit consisting of $5\frac{3}{10}$ miles of flume, $1\frac{3}{10}$ miles of tunnel, and $\frac{1}{10}$ mile of 44-inch pipe which carries it to San Andres. The outlet from San Andres Reservoir is a tunnel roughly 4

feet wide, 6 feet high, and 2800 feet long. A 44-inch pipe receives the water from this tunnel at elevation 367 feet and carries it to Baden, a distance of about 27,000 feet. At Baden this pipe divides into two 30-inch lines, one 43,000 feet long leading to College Hill Reservoir, with a capacity of 13,500,000 gallons at elevation 255 feet, and the other 36,000 feet long, known as the Merced branch, going to Central pump at elevation 190 feet, located at Sloat Boulevard and Twenty-third Avenue in San Francisco. The Merced branch passes through the Rancho de la Merced, an old Spanish grant, and a spur-line 16 inches in diameter enables water to be taken from the pipe and pumped to Lake Honda distributing reservoir at elevation 370 feet by Ocean View pumps situated near the San Francisco county line. Ocean View pumps consist of two units with total daily capacity of 6,000,000 gallons. This station can also take water from the College Hill branch, which passes just to the east of the pumps. A second spur from the Merced branch 22 inches in diameter carries water to City pumps on the shore of Lake Merced in San Francisco. City pumping station contains two units with a total daily capacity of 7,500,000 gallons, which pump either San Andres or Lake Merced water into Lake Honda. Central pump is a single unit with a capacity of 8,000,000 gallons daily, which receives its supply from the end of the Merced branch and forces it to Lake Honda.

Crystal Springs Reservoir at elevation 288 feet delivers its supply through a 44-inch pipe 89,500 feet long to University Mound Reservoir in the southeast quarter of San Francisco. An electrically operated pumping station at Crystal Springs Dam can be used to pump the water through the pipe-line when the demand is greater than can be met by the ordinary gravity flow. This station also contains a second unit which may be used to pump Crystal Springs water to San Andres whenever necessary, through a wood flume 29,300 feet long built along the east slope of the valley occupied by these reservoirs. At Millbrae a 10,000,000-gallon pump is so arranged as to take water from the Crystal Springs line and force it into the pipe carrying the San Andres water to San Francisco.

Water from the three sources of supply in

the Alameda system, namely, Livermore and Sunol valleys and Calaveras Reservoir, is united at Sunol and carried through the same transmission system. The infiltration system consisting of 8985 feet of rectangular tunnels with concrete tops and concrete-lined sides pierced with numerous 2-inch pipes, fed by 2725 feet of auxiliary perforated concrete pipe 36 inches in diameter, with open joints, collects the supply from the water-filled gravels. The collecting system is below the surface of the ground water which is maintained by Sunol dam, a concrete structure about 28 feet high at the valley outlet.

The Calaveras supply is discharged from the reservoir through a 48-inch pipe laid in an outlet tunnel which pierces the west abutment of the dam. The water is allowed to flow down Calaveras Creek to Sunol, where it percolates through the gravels into the infiltration system.

The well supply from the Livermore Valley is abstracted from the underground gravels by pumps and discharged into a 30-inch pipe 28,000 feet long, which carries it to Sunol and delivers it into the main gallery of the infiltration system at the Water Temple, a structure of classic design which surmounts the basin at the meeting-point of the various sub-sources of the Alameda system.

Beginning at the Water Temple, a concrete conduit below the ground surface carries the supply to Sunol Dam. Passing through the interior of the dam from end to end, the water enters the first of five tunnels having a total length of 14,500 feet, which together with 11,400 feet of concrete conduit form the Sunol Aqueduct. This aqueduct has a total length of 4.9 miles and a capacity of 70,000,000 gallons daily. It delivers the water to the Niles regulating reservoir, which has a capacity of 5,000,000 gallons at an elevation of 181 feet. From Niles Reservoir two pipe-lines transport the supply on its way to San Francisco. The first is a 36-inch pipe 56,000 feet long which carries part of the supply to Dumbarton Point on San Francisco Bay. The Bay is crossed by means of two 16-inch and two 22-inch submarine pipes, each 6400 feet long. The submarines have flexible joints permitting a movement of 21 degrees from a straight line in order to accommodate the pipe to the uneven floor of the Bay. On the west shore of the Bay an electrically operated centrifugal pump forces

the water through 51,500 feet of 36-inch pipe to the Belmont pumping station. Belmont pumps, consisting of seven steam-driven units with a capacity of 27,000,000 gallons, force the water through 35,000 feet of 36-inch pipe and 16,700 feet of 54-inch pipe to Millbrae, where the line is connected to the Crystal Springs-University Mound pipe. The second line from Niles Reservoir begins with a 44-inch pipe 15,600 feet long which carries the water to a point near Irvington. From there the supply is transported through the Bay Division of the Hetch Hetchy Aqueduct built by the city of San Francisco and used by the Spring Valley Water Company under an agreement with the municipality. The Bay Division Aqueduct begins near Irvington with a 60-inch pipe 48,500 feet long which runs to the east shore of San Francisco Bay at Dumbarton Point. The Bay crossing is made with a 42-inch cast-iron flexible-joint pipe for the first half-mile. The west end of the submarine pipe terminates in the bottom of a large concrete chamber, which also acts as the end pier for a steel span bridge about 3000 feet long, supported by concrete piers, which carries a 60-inch pipe from the end of the submarine to the west edge of the Bay. From the end of the bridge to Crystal Springs Reservoir, into which the water is delivered, the line consists of 50,100 feet of 60-inch pipe and a 10-foot tunnel 8700 feet long. An electrically operated pumping station with a daily capacity of 32,000,000 gallons, located near the Bay, pumps the water into Crystal Springs Reservoir.

The distributing system in San Francisco is necessarily complicated owing to the uneven topography of the city. San Francisco is essentially a city of hills. Covering an area of 46 $\frac{1}{2}$ square miles, it ranges in elevation from sea-level to over 900 feet. The hills do not rise gradually in easy slopes, but are abrupt and occur irregularly. Consequently the distributing-pipe system is divided by closed gate valves into a large number of major and minor areas in order to avoid excessive pressure variations. A large amount of pumping is necessary after the water reaches the city. In 1924, 44 per cent of the consumption was pumped. The total installed pumpage capacity of the system is 187,000,000 gallons daily, 35,000,000 of it in San Francisco. [Continued on page 29]



Calaveras Reservoir dominates the trans-Bay (or Alameda) Division of Spring Valley's catchment system. It is replenished by the streams of a very productive watershed in the Mt. Hamilton spur of the Coast Range. Water is released into Alameda Creek, percolates through the Sunol gravels, and enters the Sunol Aqueduct.



Calaveras Dam is one of the big earth-fill dams of the world. It closes the outlet of the long narrow valley that has been converted into Calaveras Reservoir. The white tower houses the gate-valves that control the release of water through a tunnel to the creek channel below the dam.



This picture, with that adjoining on page seven, presents a panoramic view of the Pleasanton region of Livermore Valley. Dotting this expanse are the wells by which Spring Valley taps the water supply underlying the valley. This supply is pumped to the Water Temple, and flows with Calaveras and Sunol water to the Sunol Aqueduct.



The Pleasanton pumping station is situated at the outlet of Livermore Valley. Hereabouts Spring Valley has in operation some seventy-five wells to draw water from the underground gravels which are fed from a drainage area of 400 square miles. The pipe-line to the Water Temple at Sunol has a capacity of twenty million gallons per day.



The watershed or catchment area tributary to the Alameda Division of Spring Valley extends from Mt. Diablo in Contra Costa County to Mt. Hamilton in Santa Clara County. Pleasanton is midway between the two, and the underground supply of these valley acres is replenished by streams that send their unabsorbed flow to Alameda Creek.



Carfour: a place where four roads intersect. The Sunol Carfour is at the entrance to Spring Valley's Alameda County headquarters. To the left of the avenue that runs to the Water Temple is a walnut orchard; to the right, buildings occupied by the resident superintendent. These grounds are part of the old Sunol Rancho.



The famous Water Temple at Sunol draws innumerable sightseers. Here may be seen "the meeting of the waters"—from Calaveras Reservoir, the Sunol infiltration galleries, and the Livermore Valley wells. Here these waters mingle and start on the long flow down Niles Canyon, across the Bay, and up the San Mateo peninsula to San Francisco.



Beneath the floor of beautiful Sunol Valley are the infiltration galleries that gather the percolating waters of the gravel beds and deliver them to the Water Temple for the supply of San Francisco. This underground source is a natural reservoir and filter; the water is held back and forced into the galleries by Sunol Dam on Alameda Creek.



Sunol Cottage is headquarters for the Alameda Division of Spring Valley. The three units of this division—Calaveras, Sunol, and Pleasanton—are directly controlled from this office. It is but a stone's throw from the Water Temple, and within easy reaching distance of Calaveras Reservoir, Sunol Dam and Aqueduct, and the Pleasanton wells.



Alameda Creek is a "flashy" stream that has torrential flows in the height of the winter rainy season. The water here seen wasting over Sunol Dam is now conserved, and its release controlled, by Calaveras Reservoir. The conduit from the Water Temple to the Sunol Aqueduct pierces the dam transversely.



This picture, with that adjoining on page eleven, presents a panoramic view of Niles Canyon. Above the railroad, on a bench of the steep hillside, is the great concrete Sunol Aqueduct which carries Calaveras, Sunol, and Pleasanton water as far as Niles. There the water passes through Niles Reservoir to pipe-lines that convey it across the Bay.



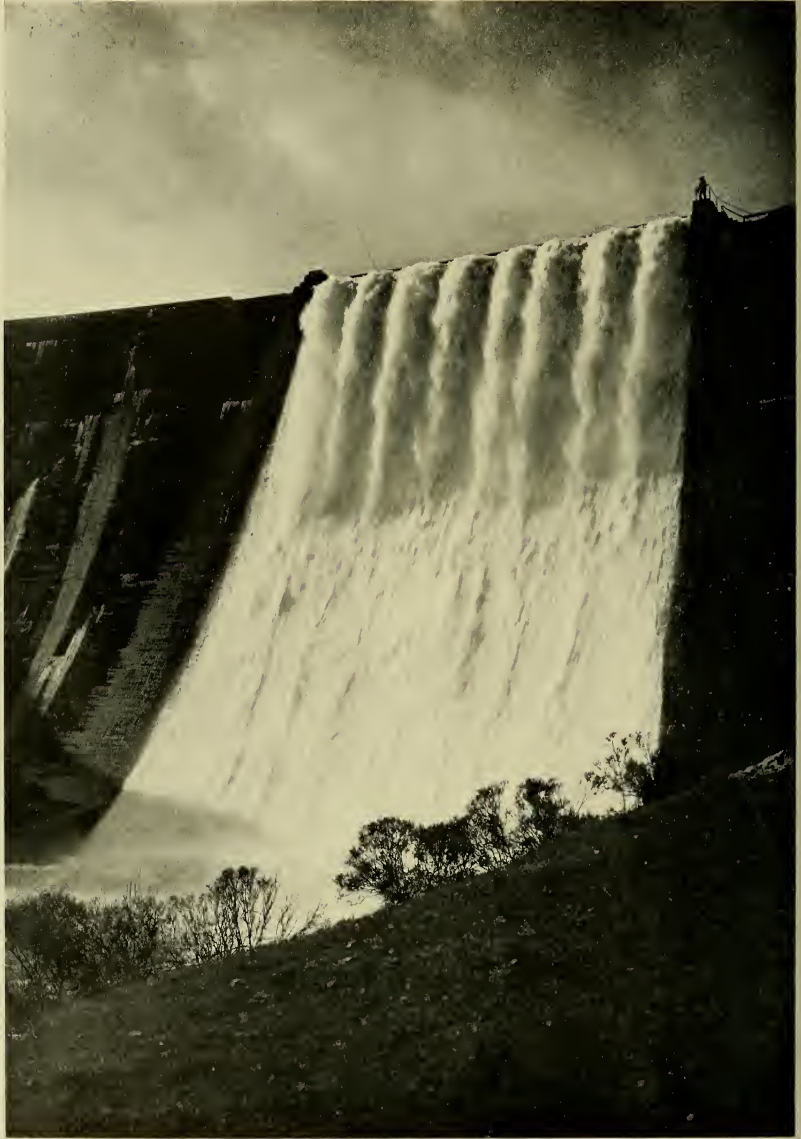
At Ravenswood, on the Bay shore of San Mateo County, the submarine pipes emerge, carrying water from the Alameda Division of Spring Valley. There are four of these submarine pipes; they were constructed with flexible joints to rest on the bottom of the Bay. Their construction in 1888 by Hermann Schussler, set an engineering precedent.



Niles Canyon is one of the great passes of California, leading from the Coast to the northern part of San Joaquin Valley. At the western outlet, "before the Gringo came," Don José de J. Vallejo maintained a primitive water supply; those old rights now belong to Spring Valley.



A down-stream view of Crystal Springs, the huge concrete dam that dominates the Peninsula Division of Spring Valley. In the foreground, the Crystal Springs auxiliary pumping station. Along the curving crest of this dam runs the Skyline Boulevard, immediately above the waters of Crystal Springs, largest of the peninsular reservoirs.



Crystal Springs Reservoir was built to accommodate the run-off of its big watershed during the recurring periods of heavy rainfall. When the great reservoir is full to overflowing, the excess of water pours over the spillway into the channel of San Mateo Creek and finds its way to San Francisco Bay.



The Bay Division of Hetch Hetchy Conduit begins at Irvington, crosses the Bay near Spring Valley's pipe-line, from Dumbarton to Ravenswood, and terminates in Crystal Springs. Left: Spring Valley line enclosed in flume, with connection to City line where this leaves Ravenswood bridge. Right: The Nilcs-Irvington line.



Spring Valley water from Calaveras Reservoir pouring through the City's Pulgas Tunnel into Crystal Springs Reservoir. Pulgas Tunnel is the western terminus of the Hetch Hetchy Conduit, and is used to deliver Calaveras water into the largest of Spring Valley's peninsular reservoirs. Eventually it will also deliver Hetch Hetchy water.



Second in size of the three San Mateo County storage reservoirs is San Andres, which takes its name from a valley famous in the annals of the Spanish explorers. In 1868 an earthen dam was thrown across San Andres Creek, forming this artificial lake. Though San Andres earthquake fault runs through the dam, it suffered no damage in 1906.



Pilarcitos, high in the San Mateo County hills, was the first storage reservoir of Spring Valley, constructed in 1862 and afterwards enlarged to its present size. Pilarcitos water formerly flowed direct to San Francisco, but now goes to San Andres. The Pilarcitos region has the heaviest precipitation of all the peninsular watersheds.



Two miles below Pilarcitos, near the dividing-line between the oceanside and the interior watershed of the San Mateo hills, the Stone Dam was built to intercept the productive flow of streams that would otherwise waste to the Pacific. This is perhaps the most charming spot to be found on all the Spring Valley properties.



Midway between Pilarcitos and Stone Dam, beside Pilarcitos Creek, is the Pilarcitos picnic-ground provided for the pleasure of the public, with no restrictions save the observance of simple rules necessary on water supply properties. It is one among several picnic places maintained by Spring Valley in San Mateo and Alameda counties.



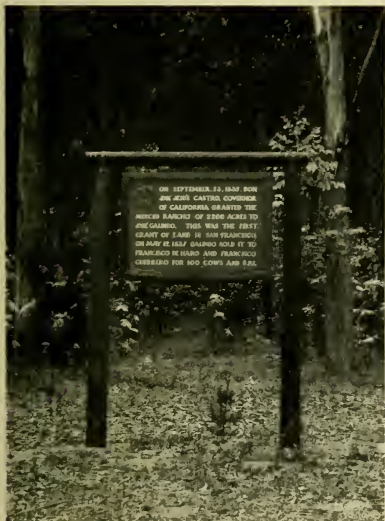
Twenty-one million gallons of water flowing daily to San Francisco from the Alameda Division of Spring Valley passes through Belmont Pumps, twenty miles south of San Francisco. This is a strategic point on the line, for by the time water from across the Bay reaches Belmont it has exhausted its gravity momentum and needs "boosting."



The Venturi meters at this station on the Highway twelve miles south of San Francisco are master-meters, measuring all the water that enters the City from Spring Valley sources. This station stands at the entrance to the Millbrae pumping station, the headquarters for the Peninsula Division, as Sunol is for the Alameda Division, of the Company.



Laguna de la Merced (Lake Merced) is a broad expanse of water in the midst of a great rancho that extends from the southwestern corner of San Francisco into San Mateo County. It supplies a minor part of San Francisco's daily water needs, and is therefore carefully safeguarded by Spring Valley, but access to the rancho is permitted.



Spring Valley has placed ten miles of Lake Merced trails at the disposal of the riding public. Signs explain the historic interest of the rancho, and direct equestrians to scenes of beauty and significance, notably to the site of the tragic Broderick-Terry duel in 1850, the last resort to the "code" in California.



There are six golf courses on the Lake Merced Rancho—the San Francisco, the California, the Lake Merced, the two Olympic Club courses, and the Harding Memorial Course maintained by the City. This view is from the porch of the Harding clubhouse, looking across one of the sporty municipal holes to the silver expanse of Lake Merced.



The first built of Spring Valley's three major distributing reservoirs in San Francisco is Laguna Honda, at Seventh Avenue opposite Ortega Street. When Pilarcitos water was first brought to the city in 1862, it was delivered here, and this "deep lake" has been part of the city system ever since. At elevation 370 feet, it supplies high city areas.



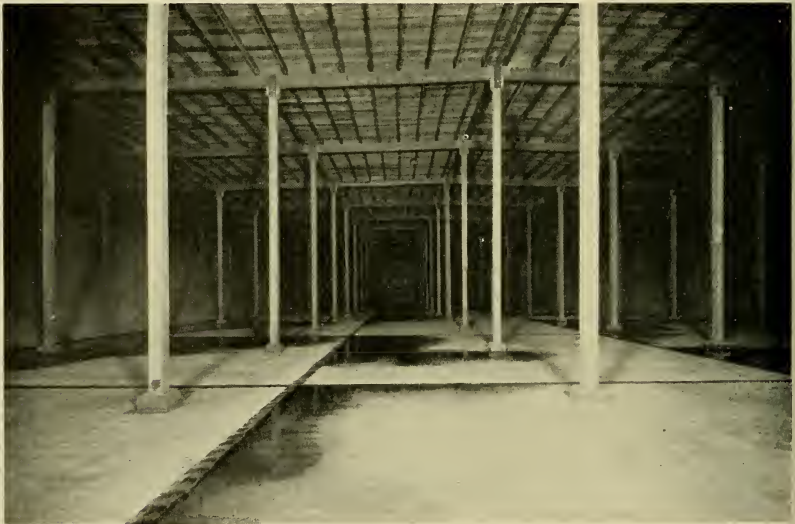
University Mound distributing reservoir is on the southeastern heights of San Francisco, at University and Bacon streets. It was built in 1885 at elevation 165 feet, to supply comparatively low sections of San Francisco. The remarkable city growth of recent years made necessary a considerable enlargement of the capacity of this unit.



On a spur of Bernal Heights, at Appleton Avenue and Elsie Street, College Hill distributing reservoir was constructed in 1870 at an elevation of 255 feet to meet the growth of San Francisco and to supply sections of our hilly city on levels lower than those necessarily served by Laguna Honda Reservoir.



When Spring Valley absorbed the old San Francisco City Water Works, it took over two distributing reservoirs on Russian Hill, Lombard-street reservoir (pictured here), and that at Francisco and Hyde. These historic reservoirs, which originally stored water from Lobos Creek in the Presidio, have been continuously in use for sixty-five years.



Spring Valley has two covered reservoirs in San Francisco—Francisco Street and Stanford Heights. The Stanford Heights distributing reservoir was constructed in 1923 to supply the rapidly growing residential districts west of Twin Peaks. This is a view of the interior before the water was turned in. The structure is of reinforced concrete.



On Sloat Boulevard at Twenty-second Avenue, against the background of Lake Merced, stands Central Pumps, the largest pumping station in Spring Valley's distributing system. The water coming into the city reaches these pumps through a concrete reservoir near by, and is pumped to Laguna Honda at the rate of eight million gallons per day.



Interior view of Central Pumps. Simplicity of architectural design gives this utilitarian structure unusual beauty. A gallery has been provided for the convenience of visitors. The station was constructed in 1911 on a plan which will permit its extension when additional units are necessary.



The brick stack of Black Point Pumps is a landmark of San Francisco; it has towered above the inner reaches of the Golden Gate, at Van Ness Avenue and Beach Street, ever since 1858. This pumping station used to serve the pioneer Russian Hill reservoirs. It now receives water from University Mount and lifts it to Presidio Heights.



The Lake Merced (or "City") pumping station, situated on the east shore of the lake, takes water from Lake Merced and also "boosts" water flowing to the city from San Andres Reservoir. The Lake Merced sand-screens adjoin the pumping station. These pumps were installed in 1891.



Less than a mile southeast of Lake Merced Pumps is the Ocean View pumping station, which pumps San Andres and Pilarcitos water to Laguna Honda. It was built in 1907 at the time that Pilarcitos Reservoir became a feeder to San Andres, to lift the increased supply coming into the city through the new Merced branch of the San Andres line.



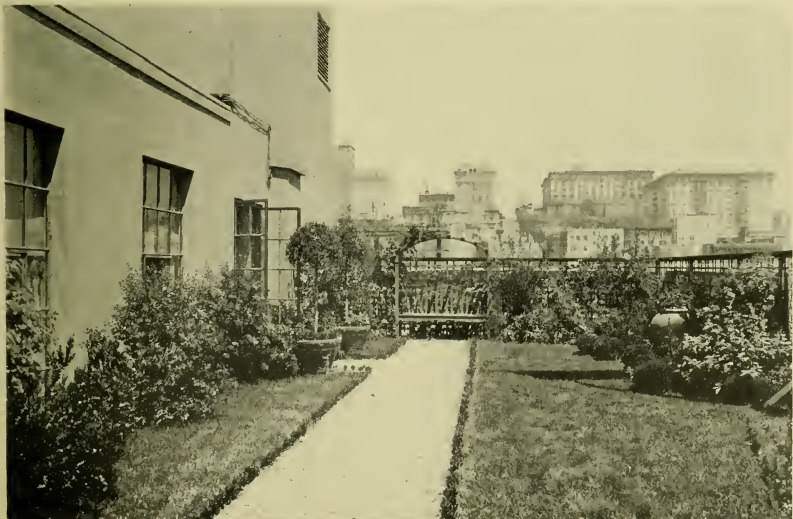
On Seventeenth Street, between Sanchez and Noe, is the Clarendon Heights pumping station. It is typical of the smaller pumps serving numerous regions into which the city has been districted for supply and fire-protection purposes. It lifts water to Stanford Heights, filling a five-million-gallon reservoir at an elevation of 620 feet.



The Directors' rooms, the executive offices, the engineering, water sales, agricultural, real estate, and other departments of Spring Valley are housed in this reinforced concrete structure designed for the Company by the late Willis Polk. It stands on the west side of Mason Street between Geary and Post. Occupancy dates from October of 1923.



In this spacious room on the ground floor where water consumers form their initial impression of the Spring Valley personnel, the effort has been to enlist the resources of dignified simplicity in art and architecture to interpret the aims of public utility service, wherein foresight and efficiency strive to go hand in hand with courtesy.



On the roof of Spring Valley Building, commanding a view of neighboring skyscrapers, San Francisco Bay, and the shores beyond, a garden of flowers, shrubs, and grasses has been planted outside a suite of rest- and refreshment-rooms for the exclusive use of the women employed in the administration of San Francisco's water supply.



On Bryant Street, between Fourth and Fifth, is the Spring Valley Yard, where all water-meters are tested before installation. The Yard is headquarters for 120 pipe men, service and meter men, and machinists. Here are kept in stock the thousand and one items that must be instantly available in the water service of a large city.



Spring Valley pipe crew installing a new line of twenty-four-inch riveted steel main in a district that has outgrown a smaller line. Pipe of this character is used for the larger distributing mains, cast-iron pipe being used for all lines tapped for house connections. Riveted iron pipe has lasted over fifty years in the streets of San Francisco.



Spring Valley's agricultural operations are widespread and diversified. In the vicinity of Pleasanton the Company leases a large acreage on shares to many tenants. Northwest of Pleasanton, Spring Valley constructed Dairy Unit No. 1, of eighty-five acres, a model dairy, of sanitary construction throughout, producing Grade A raw milk.



The Pleasanton region used to be almost exclusively a grain and hay producing section. A great deal of acreage is now devoted to dairy operations. Spring Valley has some 2000 acres suitable for dairy purposes and the growing of alfalfa. The picture shows a herd of tuberculin-tested Holstein dairy cows at Spring Valley's Model Dairy Unit No. 1.



Sugar-beets have been successfully grown at Pleasanton for many years, the heavy soil being specially adapted to this crop. Pleasanton beets are desirable for their high sugar content. Spring Valley has some eight hundred acres leased to sugar-beet growers on shares.



Wheat and barley are the most important grain crops of the Pleasanton region. Spring Valley has expended large sums in reclaiming swamp lands here, and a considerable area of this land is now devoted to grain. The crops are unusually heavy, and of fine quality. The Company leases some 2500 acres to wheat and barley farmers.



Spring Valley leases about 1200 acres for alfalfa in the Pleasanton region. There are five or six crops a year, yielding from five to eight tons per acre, and the hay is of unusually fine quality. The land is irrigated from wells, and needs only two irrigations a year.



On some 700 acres of Spring Valley lands in San Francisco and San Mateo counties, potatoes, cauliflower, cabbage, lettuce, and root crops are grown. Mushrooms too are cultivated. Prunes are grown in the Calaveras region; grapes and walnuts at Sunol. There are 100 acres of these walnuts. They are principally Franquettes, the highest type grown.

Water Supply of San Francisco

[Continued from page 4] In all there are 18 separate service districts in San Francisco, of which six might be termed major districts, the remainder being comparatively small areas which receive their supplies for the most part through automatic electrically operated pumps, supplied directly from the principal districts.

The lowest pressure zone, the University Mound district, receives its supply by gravity from University Mound Reservoir, with a capacity of 59,400,000 gallons at elevation 172 feet. This district comprises in general the waterfront, industrial and principal business areas, together with some domestic consumers in the east and north sections of the city. College Hill Reservoir, with a capacity of 13,500,000 at elevation 255 feet, supplies the next higher zone. Lake Honda, with a capacity of 44,000,000 gallons, situated near the geographical center of the city at elevation 370 feet, supplies the greater part of the domestic use. In addition to the water pumped into this reservoir from the Merced branch of the San Andres line and Lake Merced, it receives the surplus pumpage from Clarendon pumps, as well as the entire pumpage from Precita Valley pumps, an electrically driven unit of 3,300,000 gallons capacity which takes its supply from the University

Mound distributing system. The next higher district is Presidio Heights, comprising the top of the ridge running along the north edge of the city. Water is pumped to Presidio Heights tank with a capacity of 700,000 gallons at elevation 400 feet, from Black Point station, containing two steam-driven units with a total capacity of 6,500,000 gallons daily. This station pumps directly out of the University Mound pipe system. Lombard Street Reservoir supplies a district on the intermediate slopes of Russian and Telegraph hills. It is a subsidiary of Lake Honda, and receives its supply by gravity from the Lake Honda distributing system. Stanford Heights Reservoir at elevation 614 feet has a capacity of 5,000,000 gallons, and is so constructed that this may be doubled at any time. It is supplied by Clarendon pumps, consisting of two steam-operated units with a total daily capacity of 2,600,000 gallons, which draw water from the University Mound system. The district supplied by this reservoir lies on the upper slopes of the Twin Peaks hills. The highest service in the city is Forest Hill, with storage at elevation of 760 feet.

Although ownership of the drainage areas affords a practical protection to the water, as a further insurance the supply is sterilized.

* * *

Photos by George E. Fanning and Gabriel Moulin.

STORAGE RESERVOIRS

NAME	DAMS							RESERVOIRS				
	Type	Year Built	Height (feet)	Length (feet)	Crest Elevation (feet)	Slopes	Contents (cu. yds.)	Elev. High Water (feet)	Area (acre)	Capacity (m. g.)	Daily Yield (m. g.)	Water-shed (sq. m.)
Pilarcitos . . .	Earth	1867	70	520	700	2½:1-2:1	371,202	697	109	1,000	9	5.2
San Andres . . .	Earth	1868	95	710	450	3½:1-3:1	529,700	445	550	6,000		8.4
Crystal Springs . . .	Concrete	1887-90	154	600	288	.....	157,200	288	1492	22,500	9	22.5
Upper Crystal Springs . . .	Earth	1877	85	520	292	3½:1-1½:1	220,140	288				
Calaveras . . .	Earth	1924	220	1200	775	3:1 & 2:1	3,451,000	755	1450	32,800	38.2	100
									3600	62,300	56.0	136.0

DISTRIBUTING RESERVOIRS

NAME	Year Built	Depth of Water (feet)	Elevation High Water (feet)	Area (acres)	Capacity (m. g.)
Lake Merced . . .	1895	30	18	386	2,500
Lake Honda . . .	1861 & 1915	35.5	370	6	44
University Mound . . .	1885 & 1924	26	172	9.8	59.4
College Hill . . .	1870	16.5	255	3.1	13.5
Stanford Heights . . .	1923	20	614	1.2	5
Lombard Street . . .	1860	17.5	303	0.8	2.7
Francisco Street . . .	1859	8	135	1.7	2.5
Potrero Heights . . .	1897	21.5	315	0.3	1
Niles Reservoir . . .	1924	15.7	181	1.6	5

Spring Valley — An Historical Review

IN the "Days of Forty-Nine" San Francisco obtained its water from wells. Later on, water was brought from the hills across the Golden Gate and sold in the streets from water-carts. In 1858 John Bensley organized the San Francisco City Water Company, and brought water from Lobos Creek, a little stream flowing through the Presidio (U. S. Military Reservation) into the Pacific Ocean. This first organized supply was two million gallons a day; it flowed through tunnel, flume, and pipe-line around Fort Point to the foot of Van Ness Avenue, and was pumped to two reservoirs on Russian Hill—the Lombard and Francisco street reservoirs.

The year 1860 saw the beginning of Spring Valley Water Works, organized by George Ensign. The name came from a spring in the hollow between Clay and Broadway, Powell and Mason streets, called the Valley Spring. But the company's first water supply was Islais Creek, tapped at a point west of the present Mission Street viaduct. The water was carried by flume and pipe-line to a reservoir at Sixteenth and Brannan streets. The yield was 200,000 gallons a day.

More enterprising than its elder competitor, Spring Valley proceeded far afield to develop water on a large scale, and chose strategic positions for its big distributing reservoirs within the city.

San Francisco's neighboring county to the south is San Mateo, a region of beautiful valleys, mountains thickly wooded, and, nowadays, of dense suburban population. Spring Valley, immediately realizing that San Francisco was destined to become a great metropolis which could not be supplied from streams like Lobos and Islais, went prospecting for water down the peninsula. Within two years the Company was building its first catchment reservoir, at Pilarcitos high in the San Mateo hills, and its first big distributing reservoir, Laguna Honda, in San Francisco. By '62 Pilarcitos water was flowing by gravity thirty-two miles to Laguna Honda. Two years later Pilarcitos was being enlarged.

Laguna Honda (deep lake) was far from all city dwellings in those days. Rollin M. Daggett, a popular poet and journalist,

wrote of the new reservoir: "There is much to feed the eye of fancy along the road that leads to Honda, and something, withal, to touch the sense of grosser speculation. After leaving Hayes Valley, the road to the lake passes through narrow valleys studded with chaparral, and we presume peppered with fleas!"

By '65 Spring Valley had absorbed the San Francisco City Water Company, taking over the Lobos Creek supply and structures, the pumping station at Black Point, the two reservoirs on Russian Hill, and the pipes in the streets. Ever since then Spring Valley alone has borne the responsibility of supplying this city with water. The corporate name was changed to Spring Valley Water Company in 1903.

The year 1864 is notable in Spring Valley annals. It was then that a young man left the draughting-room of the Vulcan Iron Works to become assistant engineer for the water company. This was Hermann Schussler, who had been graduated in engineering in Zurich, Switzerland. He was destined to exert a profound influence upon the development of San Francisco's water supply. A. W. von Schmidt had been Spring Valley's first chief engineer. Calvin Brown succeeded him, and to Brown, who was constructing a new dam at Pilarcitos, young Schussler reported.

Hermann Schussler's first distinctive achievement was the discovery of the reservoir possibilities of San Andres Valley, northeast of Pilarcitos, and at a lower elevation, in San Mateo County.

"While making the survey for the Pilarcitos pipe-line," Mr. Schussler said many years later, "I noticed, in running one trial line up the San Andres Valley, some level ground, and I changed the route of the pipe-line and laid it on the hill, toward town, and we built the pipe-line on this second line. But I kept my old notes of the valley line, and found for a distance of nearly three miles that this valley raised but very little, perhaps ten or fifteen feet. So I kept this in mind, and when, gradually, the daily demand for water increased, I asked the executive committee of our board to go out with me and take a look at this valley, privately, in such a way that we would not be recog-

nized by those eagle-eyed farmers. I showed it to William F. Babcock, Lloyd Tevis and John Parrott. They made up their minds that there was something in it. So they set an agent to work, and bought up this valley, with most of the watershed—another four or five square miles." The damming of San Andres Valley began in 1868.

As soon as San Andres water was available, a new distributing reservoir was built on College Hill to the west of Holly Park. This hill is a spur of Bernal Heights, and its name is reminiscent of St. Mary's College (now in Oakland), which was established early in the sixties on a tract of sixty acres originally intended for a Catholic cemetery. A description of the site in 1861 locates it "on the old San Jose Road and within six blocks of the line of the San Jose Railroad."

Two very important expansions of the system began in 1875. Development of the Crystal Springs watershed was begun with the construction of an earthen dam known as Upper Crystal Springs. In that year, too, Spring Valley turned its attention to water sources across the Bay. Land was bought in Calaveras Valley, fed by streams from Mt. Hamilton. The Company also acquired the Vallejo Mills properties near Niles, where a primitive water supply had been constructed years before by Don José de J. Vallejo, a brother of General Marianó Guadalupe Vallejo. This was the beginning of the important Alameda Division of Spring Valley.

The enlargement of the Crystal Springs Reservoir went steadily forward. Watershed and reservoir properties and water-rights were acquired as opportunity offered. In 1887 the construction of the big Crystal Springs concrete dam was commenced.

The city had been growing, and by August, '85, the Company had brought into service the third of its big city distributing reservoirs—University Mound. It stands on a plateau south of Silver Avenue, directly in front of the Lick Old Ladies' Home, which occupies a building long ago erected for University College. This was a little-known section in 1885. "The spot," said a newspaper, "is one of the dreariest and windiest on the Peninsula, the sparse population declaring that on no day in the year are its rough slopes unswept by roystering breezes. No car comes within a mile of it, and the only signs of life in the neighborhood are the distant view

of the city, the flap of the blinds in the few occupied windows of the Old Ladies' Home, and the whizzing sails of the garden wind-mills on the flats beneath."

Meanwhile Lake Merced had been added to the peninsular catchment system. The Company had acquired its first water-rights on the Lake Merced Rancho as early as 1868; purchase of lake and watershed lands began in 1877.

This beautiful body of water has a recorded history going back one hundred and fifty years. On September 24, 1775, Don Bruno de Heceta, who had but recently returned from a northern exploration and the discovery of the Columbia River, encamped here with his followers. He was searching for Don Juan Manuel de Ayala, who, he had reason to believe, was engaged in a survey of the port of San Francisco. It was the feast day of Our Lady of Mercy; so, in accordance with the pious Spanish custom, Fathers Palou and Campa, who were in the party, named the lake La Laguna de Nuestra Señora de la Merced (the Lake of Our Lady of Mercy). The Merced Rancho was granted, September 27, 1835, by José Jesús Castro, Governor of California, to José Antonio Galindo. This was the first grant of land in San Francisco. Within two years Galindo sold the two thousand odd acres to Francisco de Haro and Francisco Guerrero, the consideration being one hundred cows and goods valued at twenty-five dollars. September figures importantly in the annals of Lake Merced. Here, on September 13, 1859, United States Senator David C. Broderick and Judge David S. Terry, two giants of California's turbulent politics, faced each other in a duel that ranks among the classic encounters of the field of honor. Senator Broderick fell mortally wounded. The bullet of Judge Terry destroyed forever the hold of the code duello on the Pacific Coast.

Spring Valley systematically enlarged its holdings and water-rights in the Alameda Division. In 1887, at the same time that the big concrete dam at Crystal Springs was started, Spring Valley began the construction of a pipe-line to divert Alameda Creek water from the Vallejo Mills (or Niles) Dam. This line, of course, had to cross San Francisco Bay, and the construction of the first submarine pipes was one of Hermann Schussler's great achievements.

Hermann Schussler had satisfied himself by his explorations that there was a large underground stretch of water-bearing gravels in the Sunol Valley. This fact determined the next great step in the development of the Alameda Division. A dam was built across Alameda Creek at Sunol, and water was diverted there instead of lower down at Niles. The famous filter galleries were run through the underground gravels, and at the spot where the Water Temple afterwards rose the water entered a conduit which carried it to Sunol Dam and the Niles Canyon line. This work was completed in 1900. In 1898 the first wells were put down at the Pleasanton outlet of the Livermore Valley; others were added from time to time.

The Water Temple is considered the greatest architectural achievement of the illustrious Willis Polk. Since his death a granite slab has been placed at the Temple bearing this inscription:

TO REMEMBER WILLIS POLK

A thing of beauty is a joy forever:
Its loveliness increases; it will never
Pass into nothingness.—KEATS.

The disaster of 1906 caused serious damage to the Spring Valley system. The Pilarcitos pipe-line to San Francisco was destroyed and never restored, Pilarcitos thereafter becoming a feeder to San Andres. In the city distributing system there were numerous breaks where the pipes crossed filled ground, and service connections were lost throughout the burnt district. But the distributing reservoirs in San Francisco, the great catchment reservoirs of the peninsula, the submarine pipes, the miles of tunnels on both sides of the Bay, and the costly pumping stations escaped—a striking proof of the excellence of their construction.

As far back as 1875 Spring Valley had visualized the construction of a great dam at the outlet of Calaveras Valley. The first explorations were made in 1886. Definite plans had been matured by 1906, at a time when the necessity of increasing the water supply was very much to the fore with Company officials. The disaster of that year caused a postponement, but in 1913 the work of constructing the dam was commenced. Calaveras Dam was practically completed at the end of 1924. This expansion called for a bigger aqueduct down Niles Canyon, so the old conduit was replaced by the present

Sunol Aqueduct, completed in the year 1923.

The city distributing system grew steadily with city growth. Reservoirs at strategic elevations were added through the years, and new pumping stations were installed, the most important being Central Pumps on Sloat Boulevard. To meet the remarkable growth of population west of Twin Peaks, the Stanford Heights Reservoir was constructed in 1923, and to care for the growing industrial needs down-town University Mound was the same year enlarged.

The growth of the city system is summarized in the following figures:

Year	Population	Revenue Producing Services	Miles of City Pipe	Average Daily Consumption
1875	190,000	17,074	177	11,680,000 gals.
1890	300,000	33,248	327	20,430,000 "
1900	343,000	43,771	390	25,470,000 "
1906	.....	37,894	444	29,200,000 "
1910	417,000	56,870	454	35,600,000 "
1920	507,000	71,931	638	36,168,000 "
1925	No census	91,394	713	41,000,000 "

Metering of the entire system was completed in 1918, and explains why daily consumption has not mounted in the same ratio as population. The drop in revenue-producing services in 1906 was the result of the great fire.

San Francisco is the largest American city with a privately operated water supply. The city of San Francisco has an option on the system which covers all properties, water-rights, and structures, save a few that the city feels it does not need. This option runs until 1933.

From 1858 until the adoption of the new State Constitution in 1879, California water rates were made under the authority of the state by a commission of three—appointees of the city and water company respectively, and a third selected by these two. After 1879 rates were made in San Francisco by the Board of Supervisors. This method was superseded in 1915, when the Railroad Commission was empowered to fix rates.

As early as 1875 acquisition of Spring Valley by the city of San Francisco was agitated, but the proposition of voting bonds was not submitted to the electorate until 1910. It failed to carry then, as likewise at bond elections held in 1915 and 1921.

The city program is to acquire Spring Valley and make it an integral part of the Hetch Hetchy municipal water supply heading in the Sierra Nevada Mountains.

DIRECTORS
SPRING VALLEY WATER COMPANY

W. B. BOURN, Chairman of the Board of Directors

Director, November 14, 1907, to date; President, July 31, 1908, to January 26, 1923; Chairman of the Board, January 26, 1923, to date.

S. P. EASTMAN, President

Director, April 19, 1909, to date; President, January 26, 1923, to date.

A. H. PAYSON, Vice-President

Director, June 14, 1887, to September 2, 1889; May 14, 1891, to date; President, May 10, 1906, to July 31, 1908.

E. J. McCUTCHEN, Vice-President

Director, April 19, 1909, to date.

FRANK B. ANDERSON

Director, January 13, 1904, to date.

BENJAMIN BANGS

Director, August 15, 1912, to date.

EDWARD L. EYRE

Director, April 19, 1909, to date.

E. S. HELLER

Director, April 28, 1903, to September 15, 1903; April 12, 1921, to June 15, 1922; December 13, 1922, to date.

ROBERT G. HOOKER

Director, July 15, 1925, to date.

FRANK B. KING

Director, January 28, 1920, to date.

LOUIS F. MONTEAGLE

Director, April 19, 1909, to date.

WARREN OLNEY, JR.

Director, August 15, 1923, to date.

ARTHUR R. VINCENT

Director, April 12, 1922, to date.



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April 1926



SAN FRANCISCO Water



Do you know what sea-fog is? It is the bodily, spiritual and temporal life of California; it is the immaculate mantle of the unclad coast; it feeds the hungry soil, gives drink unto the thirsting corn, and clothes the nakedness of nature. It is the ghost of unshed showers — atomized dew, precipitated in life-bestowing avalanches upon a dewless and parched shore; it is the good angel that stands between a careless people and contagion; it is heaven-sent nourishment. It makes strong the weak; makes wise the foolish — you don't go out a second time in midsummer without your wraps — and it is altogether the freshest, purest, sweetest, most picturesque, and most precious element in the physical geography of the Pacific Slope. It is worth more to California than all her gold, and silver, and copper, than all her corn and wine — in short, it is simply indispensable.

*

“ IN THE FOOTPRINTS OF THE PADRES ”
BY CHARLES WARREN STODDARD

SAN FRANCISCO WATER

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*William Babcock Lawrence: 1866-1925**By the Editor*

WHEN William B. Lawrence, Superintendent of the Water Division of Spring Valley Water Company, passed away, a cloud of heavy sorrow descended upon many men and women in many walks of life. Widely known, and as widely respected, he was very deeply loved, and his death withdrew a prop from persons and institutions that were wont to depend upon his strength, his affection, and his indefatigable helpfulness. In the closely knit family of Spring Valley, his passing loosened threads of intimacy that had been drawn tight a long time back. In many circles Spring Valley Water Company cannot be quite the same, lacking W. B. Lawrence.

The name of Lawrence is inseparably connected with Spring Valley Water Company. During the formative years of San Francisco's water supply, W. H. Lawrence was General Superintendent, and exerted an influence upon the development of the system second only to that of Hermann Schussler. In the office of W. H. Lawrence, his son W. B. Lawrence was trained, and in the long span between 1882, when he first worked for Spring Valley, and 1925, when he passed away full of honorable achievement, W. B. Lawrence left an indelible impression upon the history of the Company's progress. W. B. Lawrence was one of the great water-supply experts of the West—and that means, by proper inference, of the United States.

I

William Babcock Lawrence was born in San Francisco on the fourth day of June, 1866.

No apology is needed for introducing here

a note about the distinguished San Franciscan in whose honor W. B. Lawrence was given the middle name of Babcock. In *The Commerce and Industries of the Pacific Coast*, by John S. Hittell, 1882, there is the following biographical account:

"William F. Babcock, a native of Massachusetts, became clerk in a mercantile house of New York at the age of sixteen, and stuck to his place nine years, until the firm sent him at the age of twenty-five to take charge of a branch established in New Orleans.

"In 1852 he came to San Francisco as agent of Davis, Brooks & Co., the firm which had given their full confidence to him for years. In 1854, when the Pacific Mail Steamship Company found that it was to have a troublesome competitor in the Nicaragua route, under the management of Vanderbilt and Garrison, it selected Mr. Babcock to be its agent in association with A. B. Forbes, and for eight years he had that difficult and responsible position.

"The Spring Valley Water Company elected him to its presidency in 1864, when its water supply was 600,000 gallons a day; and he retained the place for upwards of ten years, retiring after the company could furnish 17,000,000 a day.

"Under his presidency it was necessary to construct a durable conduit twelve miles long, to bring water from the San Andres Reservoir to San Francisco, with capacity to bear a pressure of three hundred feet. Mr. Babcock sent Mr. Schussler, the engineer, to examine the wrought-iron pipes used in the hydraulic mines, and against angry pro-

test and confident predictions of failure, it was decided to adopt wrought-iron pipe, which had at that time never been used for such a length or for the supply of a town.

After some discouraging breaks, which were mere trifles as compared with the general result, the pipe was a success, and it made a new epoch in the water supply of towns."

A warm friendship strengthened by respect for each other's abilities existed between William F. Babcock and W. H. Lawrence. President Babcock recognized the worth of W. H. Lawrence, even as he recognized that of Hermann Schussler, and he had a warm affection for the boy who was named after him.

II

Although he was born in San Francisco, W. B. Lawrence was raised in San Mateo County, the home of his parents. The family moved from one lovely spot to another as the development of the Peninsula Division of Spring Valley proceeded. As an infant he lived at remote Pilarcitos, for that was then the center of the Company's activities. Then the Lawrences moved to San Andres, and W. B. Lawrence had his first schooling at Millbrae, trotting back and forth upon a pony of which he was very proud. It was a longer trip than little schoolboys make nowadays, and doubtless it impressed upon him the importance and seriousness of education. From the first, W. B.

Lawrence applied himself steadily and earnestly to his books. Later the family lived at the Spaulding place, below Byrnes' store, and Will Lawrence

attended the Cañada School. At this time his father superintended the building of the Upper Crystal Springs Dam. Thence the Lawrences returned to San Andres, and the boy was entered at St. Matthew's Hall in San Mateo.

This famous military school was conducted by Dr. Brewer and W. B. Lawrence studied there with a number of men destined, like himself, to become distinguished citizens. Among these were the late William C. Ralston, the late Henry J. Crocker, Dr. Sidney E. Mezes (now President of the College of the City of New York), George H. Howard of Hillsborough, Harry Babcock, Henry Rosenfeld, William C. Sharpsteen, the Rev. W. A. Brewer (Mayor of Hillsborough), Percy Selby, Henry W. Poett, Floyd S. Judah, and Dr. Tracy G. Russell. W. B. Lawrence imbibed the influence of this fine institution from 1871 until he was graduated in 1884. "He was a diligent student," says the Rev. W. A. Brewer, one of his playmates, "and established friendship

that were maintained till his death."

III

During the school vacation of 1882 W. B. Lawrence did his first work for Spring Val



ley Water Company, acting as rodman on the survey of the Crystal Springs pipe-line from Upper Crystal Springs to University Mound Reservoir in San Francisco. During another vacation he worked at the site of the present Calaveras Reservoir in Alameda and Santa Clara counties, assisting in the measurement of flow in various streams of that watershed.

Thus it will be seen that even as a little boy W. B. Lawrence started to become intimately familiar with the geography of Spring Valley's water-supply sources. It is no exaggeration to say that he came to know every acre of Spring Valley holdings as well as a householder knows his little front garden.

W. B. Lawrence entered the permanent employ of Spring Valley immediately upon leaving school, first acting as a clerk for his father, later earning the title of assistant to Chief Engineer Hermann Schussler. When W. H. Lawrence died, in 1888, he had the satisfaction of knowing that the system which he had helped to pioneer was developing into one of the country's great metropolitan water companies. And all that he knew about the Company—its history, its geography, its resources, and its possibilities—he had taught to his son.

One of W. B. Lawrence's first jobs as assistant engineer was the making of a survey for a proposed road from the Polhemus place around the rocky point over to the Upper Crystal Springs Dam. This road the Company afterwards built to take the place of that which ran through the valley where is now Lower Crystal Springs Reservoir.

IV

In the subsequent development of the properties W. B. Lawrence played an important part. To particularize his activities would be to recite the history of Spring Valley for forty-odd years. But the principal undertakings upon which he left his impress should be mentioned. They were: construction of Lower Crystal Springs Dam, construction of Stone Dam Aqueduct and the Davis Tunnel, enlargement of the San Andres pipe-line, the installation of Millbrae Pumps, the construction of the Alameda pipe-line, including the submarine pipes, and the development of the Pleasanton and Sunol sources of supply, including the Sunol filter galleries

and the erection of the beautiful Water Temple.

In 1908 W. B. Lawrence had been appointed Superintendent of the Water Division of Spring Valley Water Company. He thus described his duties before the Master in Chancery in 1915: "My duties are the general supervision and operation, repair and maintenance of the plant. They also comprise the care of the reservoirs, pumping plants, roads, fences, flumes, pipe-lines and telephone lines." A brief enough statement, but it represents a responsibility that W. B. Lawrence took to his heart and to his conscience twenty-four hours a day for seven-teen years.

V

When W. H. Lawrence died, in 1888, his brother James M. was appointed to succeed him as supervisor for the second district of San Mateo County. James M. Lawrence resigned the following year, and Governor Waterman named W. B. Lawrence in his place. He was elected to the office at the special election in July, 1889. In November of 1890 he was re-elected, and served with outstanding ability the complete four-year term. He was not a candidate again.

During the World War he was a member of the Defense Council for San Mateo County. And at the time of his death he was chairman of the advisory committee on re-districting the county. The work of that committee was organized by him, and was carried forward with a thoroughness and practicality by no means common in such endeavors.

VI

The estimation in which W. B. Lawrence was held may be understood from the tone of the resolutions presented to the Board of Supervisors of San Mateo County by District Attorney Swart:

William B. Lawrence was born in San Mateo County.* He lived his life of fifty-nine years in San Mateo County. And in his home in this county he died on November 2, 1925.

His life was closely associated with the activity and progress of the county.

For six years he served as a Supervisor. And from the day of his withdrawal as a public official to the day of his death, he took a keen, active interest in the upbuilding of the good name and the substantial progress of his county.

He was constantly called upon in matters of

*This was a slip of the pen. W. B. Lawrence was born in San Francisco.—EDITOR.



W. H. Lawrence

great public interest. During the great World War he served as a member of the County Council of Defense. In fact, few important commissions of the county did not include the name of Mr. Lawrence. And even at the time of his death he had consented once more to serve the county in the important matter of considering the redistricting of the county.

His view in public matters was ever forward. To him the present was always subservient to the future well-being.

In his long service with the Spring Valley Water Company (which in fact dated from his nineteenth birthday to his death), Mr. Lawrence never forgot the public interest.

Through his long-sighted policy of fairness to the public in the management of the Spring Valley properties, this great public service company has sustained the constant friendly co-operation of the general public.

Subject to the protection of the sacred use to which the properties are dedicated, the great properties were opened to the public.

The creeks, the waters, the shrubbery, the hills, were protected for the public and for the future generations. The wild life, the quail, the songbird, the deer, were protected for the future.

And when perchance a shortsighted malicious trespasser or poacher was taken into custody, Mr. Lawrence always sought to talk with him personally. In a firm and dignified way, he was told that Spring Valley is not protecting its properties and its wild life for the selfish use of its officials, but is keeping it as a public park and refuge and for the future generations.

Mr. Lawrence loved the great outdoors. "Sawyer's Camp," "The Stone Dam," "Pilarcitos," will,

through the years to come, commemorate the beautiful memory of the man who so loved to entertain his family and his friends there.

In recognition therefore of the public service in and to San Mateo County, and the high qualities as a man of William B. Lawrence;

Be it ordered, That this brief statement be spread upon the minutes of this board, and a copy thereof be forwarded to the widow, Emma Lawrence.

Regularly passed and adopted by the Board of Supervisors of the County of San Mateo, State of California, this 16th day of November, 1925, in regular meeting of said board.

JOHN MACBAIN,
Chairman of the Board of Supervisors,
County of San Mateo, State of
California.

The Board of Directors of Spring Valley Water Company spread the following resolutions on the minutes of its meeting:

WHEREAS, W. B. Lawrence, Superintendent of the Water Division of Spring Valley Water Company, departed this life on the second day of November, 1925; and

WHEREAS, W. B. Lawrence had been in the service of Spring Valley Water Company for forty-two years, from 1883 to the day of his death; and

WHEREAS, The members of the Board of Directors of Spring Valley Water Company share with all of W. B. Lawrence's Spring Valley colleagues a profound sense of sorrow for his untimely passing; now therefore be it

Resolved, That we recognize in W. B. Lawrence one of the outstanding [Continued on page 11]



W. B. Lawrence in early life

The Barometer and the Weather

By I. E. Flaa, Office Engineer

THE barometer (from two Greek words, *baros*, meaning weight, and *metron*, meaning measure,) is an instrument used in measuring the weight of the atmosphere.

Nearly 300 years ago the great Italian philosopher and scholar Galileo had his attention called to the fact that water could not be raised more than thirty-two feet in a suction-pump; so he started a series of experiments to ascertain the reason for this condition. Before these experiments were completed Galileo died, and the work was carried on by his pupil Torricelli.

Torricelli, knowing that mercury weighed about fourteen times more than water, decided that whatever caused water to rise thirty-two feet in a suction-pump would cause mercury to rise one-fourteenth of that height. To prove this he took a glass tube about three feet long, closed at one end, and filled it with mercury, then placing his finger over the open end he inverted the tube and placed it in a shallow vessel containing mercury. On removing his finger he found that the mercury in the tube dropped to a point about twenty-nine inches above that in the open vessel. From the result of this experiment he came to the conclusion that the force causing the mercury column to stand in the tube was the pressure of the air on the exposed mercury in the open vessel. Thus was the first barometer invented.

During the early stages of development it was observed that a change in weather caused a corresponding change in the height of the mercury column; shortly before and during storms the column would fall. After the storm had ceased and clear weather prevailed the column would rise. It was also observed that the mercury column would fall as the instrument was elevated—that is, taken from sea-level to the top of a mountain—showing that the pressure diminished as the distance from the earth increased.

As a result of these observations mariners since that time have carried barometers on board their vessels, enabling them to forecast the approach of storms. The barometer in its present state of perfection is used by the United States Weather Bureau and others to forecast weather conditions, by engineers

to determine the elevation of points on the earth, and to ascertain elevation of airships.

Most storms in the United States originate in the Pacific Ocean and travel at an average rate of twenty-eight miles an hour from west to east across the continent. The centers of these storms have a low barometric pressure, and are roughly from about 500 to 1500 miles in diameter. They are technically known as "cyclonic" areas, or cyclones. Cyclones should not be confused with tornadoes, those violent, destructive and terrifying storms that occur during the summer months in the region east of the Rocky Mountains. Areas of high pressures are known as "anti-cyclonic" areas, and travel in the same general direction across the continent as the low-pressure areas.

As water flows from a high to a low point, so does air travel from areas of high pressure to areas of low pressure, causing winds. Therefore, the wind is always blowing toward an approaching storm. And so, by observing the atmospheric pressure and the direction of wind, one is fairly able to forecast the approach of storms. The following rule for forecasting weather conditions is clearly stated on the Daily Weather Map issued by the United States Weather Bureau:

"Wind-Barometer Indications:—When the wind sets in from points between south and southeast and the barometer falls steadily, a storm is approaching from the west or northwest, and its center will pass near or north of the observer within 12 or 24 hours with wind shifting to northwest by way of southwest and west. When the wind sets in from points between east and northeast and the barometer falls steadily, a storm is approaching from the south or southwest, and its center will pass near or to the south or east of the observer within 12 or 24 hours with the wind shifting to the northwest by way of north. The rapidity of the storm's approach and its intensity will be indicated by the rate and the amount of the fall in the barometer."

Weather forecasts are made daily by the United States Weather Bureau, based on observations of barometric pressure, temperature, wind, humidity, rain, and sunshine, at a great number of stations scattered over the United States and Canada, and from ships at sea. These observations are made at 8 A.M. and 8 P.M. 75th-meridian time, which is

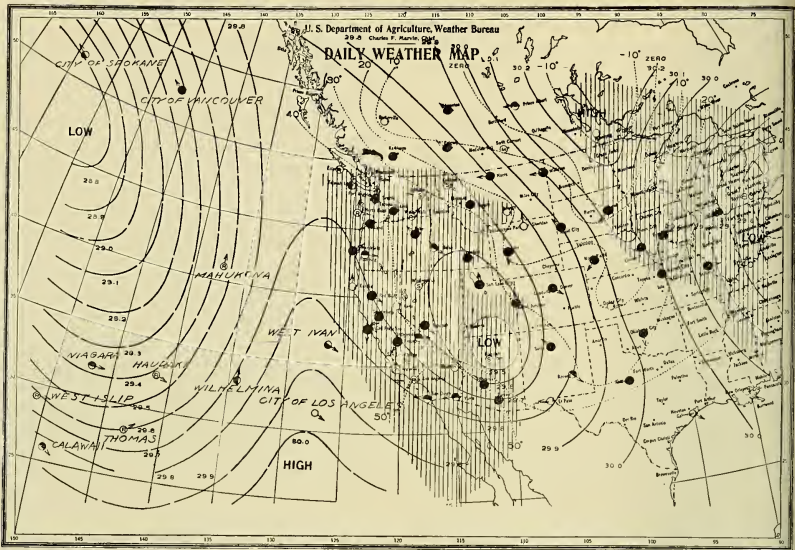


FIGURE 1. U. S. Daily Weather Map for Monday, February 1, 1926, showing center of approaching storm, about 1700 miles northwest of San Francisco. Heavy broken lines are drawn through points of same barometric pressure

5 A.M. and 5 P.M. Pacific time, and the information is transmitted by telegraph and radio to Washington and other cities where forecasting stations are located.

These data are transferred to a base map. On this map one set of lines is drawn through points of equal barometric pressure, and another set drawn through lines of equal temperature. The former lines are called "isobars," and the latter "isotherms." These lines show the location of all the areas of high and low barometric pressures, and are indicated on the maps as "High" and "Low." (See Figures 1 and 2.) After the map is completed the forecaster, from long experience and intimate knowledge, makes his forecast for the next twenty-four to thirty-six hours. The maps with the forecasts are then printed and quickly distributed to the public.

Figure 1 is the United States Weather Bureau Daily Weather Map for Monday, February 1, 1926. The forecast for San Francisco Bay region was, "Unsettled and mild, probably occasional rain later tonight or Tuesday; light winds becoming southerly and increasing."

During the next twenty-four hours there

was increasing cloudiness and a strong southerly wind, showing every indication of an approaching storm, the center of which, at the time of the forecast, was located in the Pacific Ocean about 1700 miles northwest of San Francisco, as shown by the "Low" in the upper left-hand corner of the map. (See Figure 1.)

Figure 2 is the Daily Weather Map for the following day, Tuesday, February 2, 1926, with the following forecast for San Francisco Bay region: "Rain tonight, with strong southerly winds and gales; Wednesday unsettled, with occasional rains, and winds shifting to westerly; mild temperature."

This map shows that the storm has traveled southwesterly to a point about 500 miles west of San Francisco. On Tuesday it rained 1.21 inches, and on Wednesday .35 inch, showing the accuracy of the forecast.

This storm appeared in the north Pacific Ocean about January 27, 1926, began traveling south and east, and caused rain of more or less intensity for ten days, during which time 7.19 inches fell. Stormy weather continued off and on till February 23rd, with a

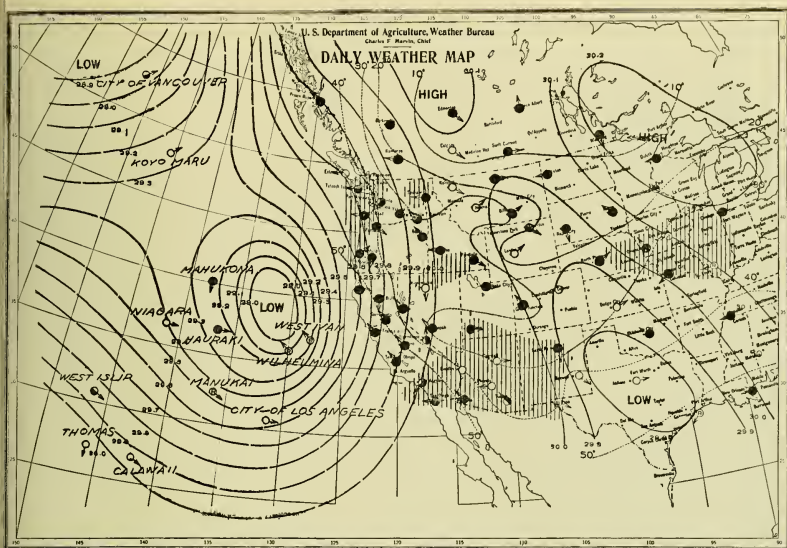


FIGURE 2. U. S. Daily Weather Map for Tuesday, February 2, 1926, showing center of storm about 500 miles west of San Francisco

total rainfall from January 27th to February 23rd of 10.27 inches, and a replenishment of the storage in the reservoirs of about ten billion gallons. Thus in twenty-seven days sufficient water was received from rainfall to supply San Francisco for 250 days, exclusive of pumping from wells.

It is instructive to study the daily figures of the replenishment of the Spring Valley reservoirs—Calaveras, Crystal Springs, San Andres, Pilarcitos, and Lake Merced—during the rainfall of February. The figures (here totaled for all the above-mentioned reservoirs) show how rapid is the replenishment of storage following rainfall on watersheds of such productivity as Spring Valley's.

Feb. 7.....	...	83.2 million gallons
" 8.....	...	63.7 " "
" 9.....	T	42.8 " "
" 10.....	.18 inches	108.9 " "
" 11.....	.84 "	264.1 " "
" 12.....	.97 "	1258.4 " "
" 13.....	.57 "	2181.4 " "
" 14.....	...	540.1 " "
" 15.....	.14 "	339.1 " "
" 16.....	T	227.1 " "
" 17.....	...	150.8 " "
" 18.....	.01 "	122.6 " "
" 19.....	.36 "	244.5 " "
" 20.....	...	209.6 " "
" 21.....	...	165.6 " "
" 22.....	.01 "	100.8 " "
" 23.....	...	81.8 " "
Feb. 24 } (inc.)	...	466.9 " "
Mar. 7 }	...	

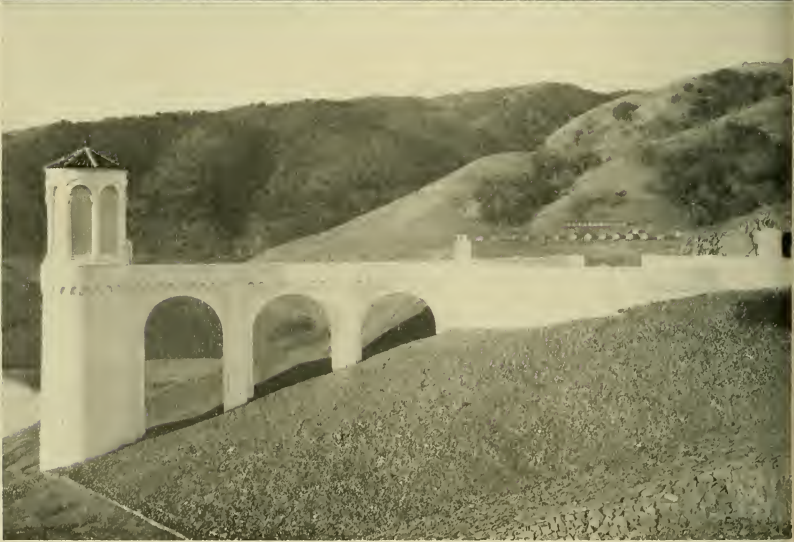
Total ... 10.27 in. 10,171.7 million gallons
Note: T indicates trace (less than .01 inch).

The cover shows a barometer with the pressure at San Francisco on February 1.

The Spring Valley Water Company maintains barometers at the Head Office, Millbrae, Sunol, and Calaveras.

The Company is indebted to the United States Weather Bureau for its courtesy in giving information when asked for, and to the A. Lietz Company for the use of the barometer shown on the cover of this issue.

Date	Rainfall in San Francisco	Replenishment Spring Valley Reservoirs
Jan. 27.....	...	...
" 28.....	2.38 inches	68.9 million gallons
" 29.....	T	73.1 " "
" 30.....	.98 "	123.2 " "
" 31.....	1.51 "	362.7 " "
Feb. 1.....	...	114.9 " "
" 2.....	1.18 "	529.5 " "
" 3.....	.29 "	465.6 " "
" 4.....	.77 "	1288.3 " "
" 5.....	.08 "	341.5 " "
" 6.....	...	152.6 " "



Above: A general view of Calaveras Dam, showing on the left Observation Hill scarred and "borrow-pitted" by the excavation of material for the construction of the dam. The rock-facing designed to prevent sloughing of the earth is laid in a series of arches. Below: The outlet tower surmounting the shaft that houses the control gates. The causeway leads from a circle of formal architectural treatment. The tower was styled in reminiscence of the Sunol Water Temple.



Here the camera records an unusual bit of water-supply installation—the laying of a submarine pipe across the Channel at Fourth Street, San Francisco. This pipe has flexible joints which enable it to accommodate itself to the uneven bottom. The length is 250 feet, and there are several angles. The pipe was put together on pontoons and lowered into place by derricks. The function of this pipe is to reinforce the water supply of the industrial district.

The Fog in Prose and Poetry

By Alexander McAdie

(During the winter just passed the fog was an unusually persistent visitor to the coast and the great valley of northern and central California. There were times when dwellers in the great domain that stretches from Sacramento to Fresno suspected that the fog had come to stay. On the inside front cover of this issue of SAN FRANCISCO WATER there is an excerpt from Charles Warren Stoddard glorifying the fog. Here are two studies of the fog by a former San Franciscan, the beloved McAdie, who once held sway in the cyrie of the Merchants Exchange Building, where E. H. Bowie now forecasts the weather. The first is from an article on "Weather Conditions on the Pacific Coast," which McAdie contributed to the excellent little encyclopedia, *Nature and Science on the Pacific Coast*. The second is in the imaginative vein—really a bit of prose poetry—and is taken from McAdie's scarce little book, *Infra Nubem*.)

I

ONE of the most marked climatic features of San Francisco is the prevalence of fog. In summer afternoons sea-fog moves through the Gate, appearing about 1 P.M. and covering the whole sky by 3 P.M. The average depth of the fog layer is 518 meters (1700 feet). Comparing the percentage of possible sunshine at San Francisco and Mount Tamalpais, it is at once apparent that the summer-afternoon sea-fog shuts out 50 per cent or more of the possible sunshine between 3 and 7 P.M. during June, July, and August. There is also curtailment of sunshine between 7 and 9 A.M. during May, June, July, August, and September.

In the winter, morning fogs, or, as they are commonly called, "tule" fogs, frequently occur. These are low-lying banks of condensed vapor formed by cooling due to radiation and contact. The land surfaces are much cooler than the water surfaces, and hence these fogs have a decided motion from the land to the sea. The average number of foggy days is twenty-four per year.

In addition to the summer-afternoon sea-fog, moving from west to east, and the land or tule fog of winter mornings, there is a third kind of fog, which may be called smoke-fog. Under certain atmospheric conditions the smoke of the city moves seaward during the forenoon and returns about 1 P.M. as a dense black pall. This is the cause of the so-called dark days. The phenomenon is of

brief duration, seldom exceeding two hours; but while it lasts causes some apprehension.

II

Cowled and penitent, like a Friar of Orders Gray, the city kneels in summer afternoons on the lower steps of the altar hills. Beneath the cassock of fog—a loosely woven serge—are hopes, prayers, truth, and gentleness. But also under that robe of gray lurk cunning, greed, pride, and pretense. Like the merciful mantle of charity, the fog covers our many sins. We who love the city know that the gray covering stretched overhead, while it dims the brightness of the sun, is at once our greatest asset and our richest blessing.

Would you know something of this mantle? Then climb the hills; for the city *infra nubem*—beneath the fog—is also a city set upon hills. From some of the upper slopes study this wondrously wrought fabric. Seen from above, it is no longer gray and forbidding, but white as driven snow; a coverlet that throws back into sunlit skies the genial warmth of summer days. Watch it come into being far beyond the Heads. The very soul of the sea, it rises like a spirit from the breast of waters. Through the broad Gate, in a full-flowing tide, it veils the water and the land. Seen from below, a level sweep and monotone of drab; seen from above, a ruffled sea of light and shade, a billowing cradle for the imperious winds. Inland it spreads, and spreading, rarer grows, a thin gray line, to die at last—if but the eye could see—upon the burnished wheat-fields of the San Joaquin.

And the sun, as it stands a moment on the water's rim, ere yet it bids our western coast "good night," sees not a cowled and sad-robed penitent, but a white-robed Youth, whose silken scarf waves loosely in the breeze.

Lover of the City, is there no lesson in this two-fold aspect of the fog? Seen in the humdrum sweep of daily life, in the rush and routine of the business day, your fellow citizens are somber-hued and unattractive. Seen from a higher vantage-ground, fling they not back the genial warmth of their humanity, the sunlight of their truer selves?

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IT is reliably stated that during the first month of this year 1926 the San Francisco dealers in scientific instruments did an unprecedented business in barometers. All California was watching the sky for rain; the Weather Bureau was the focus of nervous and impatient attention; and the barometer enjoyed an unusual vogue.

"Everybody talks about the weather," said Mark Twain, "but nobody does anything about it." After all, what can be done about it? The weather is incorrigible. Its habits are formed; it is too old a dog to be taught new tricks.

But at least the weather may be treated with politeness, and made conscious of our gratitude when it behaves with humanity, when it responds to our sighs and prayers. At the end of January this year everybody in California regarded the weather with hostility, said nasty things about it, was absolutely out of humor with its habits. Then, lo and behold! February came, the weather relented and actually heaped coals of fire upon our heads. To be more accurate in the use of words, the arid weather had a change of heart and proved that it had a tender feeling for all of us by dissolving into a tremendous weeping spell of rain.

"It is not raining rain to me; it is raining daffodils," sang the poet. The February rains did not rain rain-drops merely; they rained happiness and prosperity to divers classes of Californians. The February rains brought one kind of happiness to the farmers, another to hydroelectricians, still another to the water-supply men. A recently popular song was flouted, and Shakespeare came back into his own, chanting: "For the rain it raineth every day! Heigh-ho, the wind and the rain!"

An effort is made in this number of SAN FRANCISCO WATER to treat the weather with

the respect that it deserves when it accedes to our dearest wishes by sending seasonable rain. And not to slight another element of our weather, a certain amount of notice is herein taken of the fog. We need them both.

* * *

William Babcock Lawrence

[Continued from page 4] men who developed the Spring Valley system into its present magnitude and efficiency; and be it further

Resolved, That this Board join with W. B. Lawrence's other friends in Spring Valley Water Company—and all who worked with him were his friends—in expressing admiration for his high manly qualities, respect for his most unusual ability, affection for his memory, and sympathy for his bereaved family.

VII

William B. Lawrence was a man with a wide range of interests. He lived a full, well-rounded life. A devoted husband and father, he presided over a family distinguished for courtesy, culture, and unostentatious religious faith. He was also, in the best sense of the phrase, a man's man, delighting in masculine sociability, loving the sky and the stars that shine over a mountain camp. Rod and gun were familiar to his hands from boyhood; he was an excellent shot, and unerring in the whipping of a stream. With the fauna and flora of his beloved state he had an intimate acquaintance that had begun in observation and was constantly improved by deep readings, not only of nature but of books.

W. B. Lawrence knew no distinction between day and night when there was work calling him. There are many emergencies in supplying a great city with water when responsibility cannot well be delegated; such emergencies always found him "on the job."

He was an authority on county government, and his advice was sought by many who appreciated the richness of his experience. The political obligations of every American citizen were very real to him; he had political ideals, and disappointment neither discouraged nor embittered him.

Above all things else, he may be written down as one who loved his fellow-man. He was charitable in thought, word, and deed; he had a helping hand for the unfortunate; he had a host of friends among all sorts and conditions of men; and he will be remembered and missed a long, long time.

The Kingfisher of Lombard-Street Reservoir

THIS spring. "Hindquarters of Fancy Baby Mutton" and bundles of the pungent *Mentha viridis* are available at the markets. Which means you can now eat roast lamb and mint without going broke. The chestnut venders in North Beach have gone into the hokey-pokey business. Guerilla swimmers below Cliff House are courting permanent goose-flesh in the glacial riptides.

Mike, the ancient kingfisher, wings once more to the reservoir on Hyde-street hill. And the denizens of that purlieu know fully that spring has come. He usurps the function of the bock-beer signs and the hired Jap carpet-beater that formerly told of the birth of the season hereabouts.

Outside of the swans in Golden Gate Park, who chum with the reporters and get written up ever so often, Mike is the most eminent of local birds. He should be, for he has been commuting ever since the spring of 1916. Phil Bekeart, who spies him through a telescope from a nearby apartment window, reports that Mike has a few more gray feathers on his noddle, but is decidedly no wiser.

For a bird that has been living so long, Mike has surprisingly little sense. True, the intelligence of kingfishers, like that of horses, has been greatly over-rated.

His home is far up the Sacramento Valley somewhere, a fitting region for a fresh-water bird. Around dawn he sets out for San Francisco. He flies over the Suisun marshes, where plenty of fish with tender bones in them are slapping about in the reeds. Then over the flats at the Carquinez Straits, where any kingfisher can pick up a meal without half trying—on shrimps, tiny crabs, open mussels, and similar fauna.

But not Mike. He keeps flapping his dew-laden wings, past the estuary, over the bay, and straight for this reservoir, arriving about time the milkman is haggling with the contiguous janitors about the bottles. There he encamps on the edge of the tank and looks into the water.

The scenic assets of the reservoir are *nil*. No seats, no flowers, nothing; just an iron fence around. Nobody goes there except aged men driven out by the extreme noisiness of

their grandchildren. One of these old-timers, with his face pressed between the bars, was staring at Mike yesterday.

"Dunno what ails that fool bird," he grumbled. "There never was any fish here, unless somebody threw in a can of sardines. I tried to fish there myself back in the eighties, but never got a bite. There was no railing put up then. And what's more, I never heard of anybody else catching a fish in that water. Know how old this reservoir is? Seventy years old. It was made in 1856, the year I was born.

"Now, that bird's been here every morning for three weeks. He sits there for hours like a concrete eagle, looking for a trout. I dunno whether he's just plain goofy or an optimist. Kellogg, that expert in bird language, ought to come up and put him wise to the situation."—"The City Day By Day," by *Idwal Jones in The Examiner.*"

* * *

A Flowing Lullaby

WHEN I was playing baseball some years ago a veteran ball-player of some years in the major leagues was signed by our club," said S. H. Fiderton, travel expert with the American Express Company, who was a recent guest at the Whitcomb. "We became very friendly and asked to be room-mates.

"I was so tired the first couple of nights we were together that I turned in before my friend, and he arose before I did in the mornings. The third night, however, he 'hit the hay' before I went upstairs and was sound asleep when I entered the room. I found the bathtub faucets turned on full. Arousing him from sleep, I told him of his oversight.

"Sure I know about it,' he told me. 'I turned them on purposely. What d'ye mean by shutting off the water?'

"But, man, look at the water you're wasting,' I told him.

"Can't help it,' he explained. 'You see I was born up in the Ozark mountains and there was a waterfall right back of the house. I can't go to sleep without hearing the sound of running water.'—"Today's Best Story," in *San Francisco Chronicle.*

Vitruvius Descants on Water

By the Editor

OF the two ancient Romans who wrote learnedly about water, one was a water commissioner, the other an architect. The famous book by Water Commissioner Frontinus, the friend and appointee of Emperor Nerva, has been reviewed already in SAN FRANCISCO WATER. It will be both instructive and amusing to dip into that portion of the great treatise of Vitruvius, the architect, which deals with the same subject.

Vitruvius, author of *De Architectura Libri Decem* (Ten Books on Architecture), lived under Emperor Augustus and enjoyed a good deal of the imperial favor. He does not seem to have been a great architect, but he wrote on the subject with sagacity, and when his book, which had been lost for a long time, was rediscovered in the fifteenth century, it took its place as an authoritative treatise and exercised an important influence upon architecture from the very beginning of the Renaissance.

Vitruvius devotes his entire eighth book to water, emphasizing the importance of the subject with these introductory remarks:

"Water is of infinite utility to us, not only as affording drink, but for a great number of purposes in life; and it is furnished to us gratuitously. Hence the priests of the Egyptian worship teach that all things are composed of water; and when they cover the vase of water which is borne to the temple with the most solemn reverence, kneeling on the earth, with their hands raised to heaven, they return thanks to divine goodness for its creation."

Be it noted that when Vitruvius speaks of water as "furnished to us gratuitously," he means that it is a gift of the gods. The Romans of his time paid for water, even as we do—indeed, they too paid meter rates.

The chapter Vitruvius devotes to "the method of finding water" is so good that it deserves to be quoted at some length. Water is easily found, he remarks, "if the springs are open and flowing above ground." But, "if that be not the case, their sources under ground are to be traced and examined." Note how this is to be done, according to the Vitruvian formula:

"Before sunrise one must lie down pros-

trate in the spot where he seeks to find it, and, with his chin placed on the ground and fixed, look around the place." In that matter of the chin's position Vitruvius permits no compromise, for "the chin being fixed, the eye cannot range upwards farther than it ought, and is confined to the level of the place." He continues: "Then, where the vapours are seen curling together and rising into the air, there dig, because these appearances are not discovered in dry places."

"We should also," he says with justice, "consider the nature of the place when we search for water. In clay, the vein of water is small, the supply little, and not of the best flavour; and if in low places, it will be muddy and ill-tasted. In black earth, only tricklings and small drops are found, which, collected from the winter rain, subside in compact hard places, and are of very excellent flavour. In gravels, the veins are small and variable, but they are exceeding well flavoured. In the strong, common, and red sands, the supply is to be depended on with more certainty, and is of good taste. In red stone, abundance and that of good quality may be obtained, if it do not filter away and escape through the pores. At the feet of mountains, and about flinty rocks, the supply is copious and abundant; it is there cold and more wholesome. In campaign countries (this means, on broad, treeless plains), the springs are salt, gross, tepid, and unpleasant, except those which, percolating from the mountains beneath the surface, issue forth in the plains, where, especially when shadowed by trees, they are as delicious as those of the mountains themselves.

"Besides the above signs for ascertaining in what places water may be found, are the following: When a place abounds with the slender bulrush, the wild willow, the alder, the withy, reeds, ivy, and other plants of a similar sort, which neither spring up nor flourish without moisture. For these plants usually grow about lakes, which being lower than the other parts of a country, receive both the rain water and that of the district, through the winter, and, from their size, preserve the moisture for a longer period. On

these, however, we must not rely. But in those districts and lands, no lakes being near, where the plants in question grow spontaneously, there we may search."

Writers who try to trace water-witching (the use of the divining-rod to discover hidden waters) to antiquity will look in vain for any mention of the subject in Vitruvius. He either knew nothing about it or disdained to mention it. The chances are that water-witching, which is more common today than most people imagine, was unknown to Greek and Roman antiquity. But Vitruvius does give us some rather strange-sounding formulæ for finding water where the signs already enumerated do not appear. To quote again:

"Dig a hole three feet square, and at least five feet deep, and in it, about sunset, place a brazen or leaden basin, or larger vessel, if one be at hand. It must be rubbed over with oil inside and inverted, and the upper part of the excavation is to be covered with reeds or leaves; on these the earth is to be thrown. On the following day let it be opened, and if the inside of the vase be covered with damp and drops of water, water will be there found. If the vase placed in the pit be of unburnt clay, having been covered as above directed, when uncovered it will be damp and perhaps destroyed by the moisture. A fleece of wool being placed in the same pit, if, on the following day, water can be expressed from it, the existence of water in the place is indicated, and that in abundance. Also, if a trimmed lamp full of oil be lighted, and placed in the covered pit, and on the following day it be not exhausted, but still remain unconsumed, and some of the wick and oil present a humid appearance, it shows that water will be found there, inasmuch as heat invariably draws the moisture towards it. Moreover, if in such a place a fire be made on the ground, and the ground, when heated, throw out cloudy vapours, water will be found in it."

Vitruvius apparently intends that all these tests be used in succession before the presence of water is conclusively affirmed. The next step is to sink a well; "and if the head of the spring be found, many other wells are to be dug round about it, and, by means of under-cuttings, connected with it so as to concentrate them."

"The spring-heads, however," he says,

"are chiefly to be sought in mountains and northern districts, because, in those situations, they are generally sweeter, more wholesome, and more copious, on account of their being sheltered from the rays of the sun, of the trees and shrubs in those places being in greater abundance, and of the sun's rays coming obliquely on them, so that the moisture is not carried off.

"Valleys in the midst of mountains receive a very large proportion of rain, and from the closeness of their woods, as well as from the shade which the trees afford, added to snow, which so long remains on them, allow it to percolate through their strata, and thus arrive at the foot of the mountain, when, issuing forth, it becomes the source of a river."

Vitruvius next gives us his theory of rainfall, which, it will be agreed, is very well thought out and very clearly expressed:

"Water collected from showers," he says, "possesses wholesome qualities, because it consists of the lightest and most subtle particles of all springs, which, cleansed by the action of the air, and loosened by the tempests, descend upon the earth.

"And the reason why showers do not fall so often upon plains as they do on mountains or their vicinity is, because the vapours ascending from the earth at sunrise, to whatever part of the heavens they incline, drive the air before them, and, being in motion, receive an impetus from the air which rushes after them. The air rushing on, and driving in every direction the vapour before it, creates gales, and blasts, and eddies of wind. Hence the winds, wherever they travel, extract from springs, rivers, marshes, and from the sea, when heated by the sun, condensed vapours, which rise and form clouds. These, borne up by the winds when they come against the sides of mountains, from the shock they sustain, as well as from storms, swell, and becoming heavy, break and discharge themselves on the earth."

We are so used, from our studies at school, to think of Jove as "the thunderer" and "the cloud-compeller," that it may come somewhat in the nature of a surprise to find that there were scientists as well as poets in the antique world.

Vitruvius gives us, too, some hints of the state of medicine in his time when he speaks of hot springs and mineral waters. He says

that "bituminous waters, taken inwardly, act as purgatives"; that "there is a species of cold nitrous spring which, when taken, purges, and in its passage through the bowels, diminishes scrofulous tumours"; and that "there are other springs whose water is acid, which, when drank, have the effect of dissolving the stone which forms in the bladder." Vitruvius knew nothing about the importance of iodine in water, but he seems to have known that certain waters caused goitre, as witness: "At Æqui, in Italy, and in the territory of the Medulli on the Alps, there is a species of water, the use of which produces swellings of the neck."

Correct remedies for simple goitre were used even in remote antiquity, although the fact that all those remedies contained iodine was unknown. However, Vitruvius seems to have been the only ancient writer who connected the prevalence of simple goitre with the drinking of certain waters.

The fantastic (or would it be better to say the seemingly fantastic?) is not lacking. "In Arcadia," he informs us, "at the well-known city of Clitorium, is a cave flowing with water, of which those who drink become abstemious." Before scoffing at that, pause to remember that the gold-cure is still with us. And is not this a reference to mercury-poisoning: "At Susa, the capital of Persia, there is a fountain at which those who drink lose their teeth"? On the fountain, he says, was an inscription of warning in rhyme. He gives the verses, and they go to show that, even before Omar Khayyam, Persian poets waxed eloquent when writing against water:

A dreaded spring you see,
Yet if their hands, good stranger,
Folks choose to wash, they're free
To do so without danger;
But if from your tongue's tip,
Just passing from the lip
Into your hollow venter,
This liquor pure should enter,
Your tools for munching meat
Straight on the ground will tumble,
And leave their empty seat
With toothless jaws to mumble.

Many claims are made for water nowadays; but is it ever said of water anywhere that it gives the drinker a good singing voice? Such was the property of the water of the town of Ismuc and the territory surrounding it in Numidia. Vitruvius assures us that he had the story at first hand. He says:

"C. Julius, the son of Massinissa, to

whom the town and territory belonged, fought under Cesar the Elder. Lodging in my house, our daily intercourse led us to discuss subjects of philology. On an occasion, talking on the power of water and its virtues, he assured me that in the above territory there were springs of the same sort, and that persons born there had excellent voices for singing; and that on this account persons went to the transmarine market to buy male and female slaves, whom they intermarried for the purpose of procuring progeny, not only of excellent voice, but of great beauty."

By research not too carefully checked, the press agents of our great singers might establish a connection between vocal pre-eminence and drinking-water. What water did Caruso quaff? Has anyone analyzed the water that John McCormack drank in Athlone? Two American singers have recently attained fame at the Metropolitan Opera. What about the water of Kansas City that Marian Talley drank, and the water of Bakersfield that wet the golden throat of Lawrence Tibbets?

This résumé of the Vitruvian essay on water cannot better conclude than with his tribute to the life-sustaining element. He writes:

"Nothing is more necessary than water. For such is the nature of all animals, that if they do not receive a supply of grain, they can subsist on fruits, flesh, or fish, or something of those sorts; but without water, neither the body of an animal, nor even food itself, can be raised, preserved, nor provided. The utmost diligence and labour, therefore, should be used in choosing springs, on which the health of mankind depends."

* * *

WHEN tenants of the Schroth Building in Stockton Street happen to meet their genial superintendent, Ed Glennon, they might inquire whether he thinks it is possible to bail out the Pacific Ocean, or if the Spring Valley Water Company can be drained in a short time. Glennon, it seems, volunteered as first aid when his sister was house-moving on Sunday. His particular stunt was to unjoint the gas-stove so that it could be moved. Ed disconnected the water—or at least thought he did. Then he got a three-gallon pail and started his task of draining the tank. After he had been at the job for about an hour somebody remarked that it was taking Ed a long time to empty the tank. "You'll never get that job done," said little brother. "I'll attach a hose and we'll have that tank empty in a jiffy." The hose attached, the water still spouted forth. A great light dawned upon the assemblage. Genial Ed hadn't shut off the water from the main Spring Valley pipe and had been trying to drain the entire water system dry.—Harry B. Smith, in *S. F. Chronicle*.

Magical El Polin

"EL POLIN!" Colonel William H. Tobin, quartermaster of the Presidio of San Francisco, exclaimed. "What do you know about that wonderful spring?"

Both of us had made brief speeches before the South of Market Boys' Association.

I had met those delightful "roughnecks" for the first time. I had tried to make them laugh.

Colonel Tobin had greeted them with a tear in his voice. For the colonel was born south of Market. The good old days had come back with a rush when he looked into the welcoming faces of 1200 neighbors.

"El Polin," I whispered, "is the spring of many babies. Think of General Vallejo's sixteen children, Arguello's thirteen, Carrillo's twelve, José Antonio's twenty-two! Consider with awe the large families of the soldiers stationed in the old Presidio!

"Why, it's even said that not only the Spaniards, but the Indians before them, knew of El Polin's magical properties! But," I sighed, "all I know is what I've read in Eldredge's fine book, 'The Beginnings of San Francisco.'"

"Ever seen the spring?" the Colonel demanded.

"Not yet. Mr. Lewis F. Byington, Mr. Luke Fay, and I plan to visit the Presidio some day. They want to show it to me. Mr. Fay knows exactly where it's located."

"After they've shown you where they think it is," the Colonel was positive, "I'll show you. Let 'em try. After they've failed, I'll show you where El Polin pours forth its wondrous waters."

A few days later Mr. Byington, Mr. Fay, Colonel Tobin, Angelo J. Rossi's son, and I descended from an automobile on the side of a hill in the Presidio.

A bit of woods, a verdant slope, brambles and nettles—the Presidio drowsing in the sun.

"Gentlemen," the Colonel said, "this occasion is far more historic than you can imagine. Before I show you the spring, let me read you a letter—only one of many—asking to disclose the precise location of this most famous of all springs in California."

The letter proved to be a request from a

most important official begging to know just where El Polin is located.

"I didn't tell him," the Colonel declared. "I've told no one. You see, not many persons even in the army know that I covered up the source of the spring thirteen years ago. I did it to save the spring from defilement. I was born in San Francisco and I love its every tradition."

"On the other hand," the Colonel smiled, "everyone knows that El Polin supplies all the drinking-water used in the Presidio. But they know only that—"

"How is it possible," I exclaimed, "for you to supply the Presidio with El Polin water and yet keep its source a secret?"

"Gentlemen," Colonel Tobin waved his hand over the landscape, "where do you think the spring is?"

"You told me," I declared, "that there is a pipe which carries the water from the spring one mile and a half to a place where your men fill the drinking-bottles. That's all I know."

"Although I am not sure," Mr. Byington said, "I'd guess it gushes forth near that big tree."

"No, sir!" Mr. Luke Fay's kindly voice exclaimed, "I'd say it first rises to earth close by that fence. See the sun sparkling on the water!"

"Come with me," the Colonel led the way. "Listen and you will hear it gushing up."

In the stillness we heard the sound of living water.

"Each of you gentlemen has given his word of honor not to disclose the location of the source. That pledge extends until I can make arrangements to have the spring treated in the way its history deserves."

"I plan to have it dug out, the earth around it widened into a hole that shall be stone-lined. Above I'll build a cover to guard it from the rain and sun. A tablet will be set in the wall setting forth El Polin's wonderful history."

"Let us drink to El Polin," Mr. Byington suggested.

So we five lifted glasses of El Polin's sparkling water, in a toast to El Polin herself. The spring of many babies.

—BRETT PAGE: "So This Is San Francisco," in *San Francisco Call*.

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THE ANCIENT
ROMAN REGARD FOR
RUNNING WATERS . . .
ALMOST AMOUNTED
TO ADORATION . . .
WATER, EVER FRESH
AND EVER CHANGING, WAS USED TO
MEMORIALISE GREAT MEN AND
NOBLE DEEDS. WATER-SHRINES AS
SCULPTURED FOUNTAINS HONOURED
THE DEAD AND SERVED THE LIVING.

— SIR BANISTER FLETCHER

July 20

SAN FRANCISCO Water





FIFTEEN days before reaching Puerto Rico, there was a scarcity of water, and the ration had to be diminished (the amount given for the twenty-four hours was but little more than a quart, nor were we allowed to make chocolate). But Father Junípero endured these privations with such patience that not a single complaint was heard from him, nor was there to be noted in him any sign of sadness. This caused no small comment, and some of the companions used to ask him if he were not thirsty. He would always answer, "It gives me no concern," and if anyone would complain that he could not stand it, he was accustomed to answer, with quite as much wit as wisdom: "I have found a good remedy against feeling thirsty; and that is, to eat little, to talk less and so save my saliva."

*

PALOU'S LIFE OF JUNÍPERO SERRA

SAN FRANCISCO WATER

PUBLISHED BY

SPRING VALLEY WATER COMPANY

SAN FRANCISCO, CALIFORNIA

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Increased Supply and Service Betterment

A NEW epoch in the history of the water supply of San Francisco began in May of this year when the city authorities, having completed the transbay submarine line, which was the last unfinished link in the Bay Division of the Hetch Hetchy Aqueduct, turned over to Spring Valley Water Company for immediate use the entire Bay Division line from Irvington in Alameda County to Crystal Springs Reservoir in San Mateo County.

Water from the Calaveras Reservoir has ever since been flowing through this Hetch Hetchy Aqueduct to Crystal Springs, emptying into this big San Mateo County Reservoir (second largest in the Spring Valley system), through the outlet of Pulgas Tunnel, as pictured on the cover of this issue of SAN FRANCISCO WATER.

Spring Valley Water Company is paying the City of San Francisco at the rate of \$250,000 a year for the use of this Irvington-to-Crystal Springs line.

The Water Company is now able to bring from its Alameda sources 34,000,000 gallons more water than before, as the capacity of its own transbay lines is limited to 21,000,000 gallons daily. Spring Valley is now actually bringing across San Francisco Bay 51,000,000 gallons of water every day.

The water developed by Spring Valley and available for daily use in San Francisco has now reached the total of 66,000,000 gallons. And this is by no means the end of Spring Valley potentialities—additional development is not only possible but feasible.

Twenty-four million gallons daily of additional water was the minimum development required of Spring Valley Water Company under the decision of the Railroad Commission, and to assure this minimum re-

quirement, the Company raised Calaveras Reservoir to a height of 220 feet, enlarging its capacity to a total of 32,800,000,000 gallons. At this stage of its development, Calaveras Reservoir is capable of supplying 33,000,000 gallons daily. At present, it is sending to San Francisco 38,000,000 gallons daily.

San Francisco and the peninsula communities supplied by Spring Valley are using an average of 44,000,000 gallons daily. The demand on the system has been increasing annually at an average rate of 2,000,000 gallons daily. It is therefore apparent that Spring Valley, with a development of 66,000,000 gallons daily, is equipped to take care of present needs and anticipated new needs for years to come.

Following the amicable settlement of the water-rate problem in 1921, the Company started a program of main extensions in San Francisco. Since July 1, 1921, there have been installed approximately sixty-six miles of new distribution mains. The latest installation is the most significant of all—the new line from Laguna Honda. Even before the additional water started flowing across the bay from Calaveras to Crystal Springs, the Company began the installation of this new pipeline to improve the water service in that large section of the city which is supplied from Laguna Honda Reservoir. Pictures illustrating this installation are to be found in this issue.

The route of this new distributing line is from Laguna Honda Reservoir along Seventh Avenue to Golden Gate Park, across the Park, emerging at Sixth Avenue, thence down Fulton Street to Fourth Avenue, over Fourth Avenue to California Street, and down California to Franklin Street. The line

has been completed across Golden Gate Park.

This new line from Laguna Honda Reservoir will improve water service for forty per cent of the consumers, domestic, commercial and industrial, in San Francisco.

The population of the city has been growing at an unprecedented rate, and new demands that this growth has made upon the Spring Valley system are met in part by the installation of this line from Laguna Honda. As evidence of the condition that arose—and that still continues—it may be mentioned

that on December 31, 1920, Spring Valley had, within the city, 74,328 active water services, and that by May 31, 1926, the number had increased to 98,289. This is a net increase of 23,961 services, or 32 per cent.

Much remains to be done in order to give our growing community adequate water service. The engineering department of Spring Valley Water Company has worked out the necessary plans, but the financial problem is a difficult one, and will demand very special attention.

A History of the Water Supply

Reviewed by the Editor

RAY W. TAYLOR, a newspaperman of the highest standing, has just published a book dealing with the history of the water supply of San Francisco. There are several books and a whole cloud of pamphlets concerned with this subject, but this is the first volume written from the historical standpoint alone. As such it deserves special attention.

The title of the book is "Hetch Hetchy: The Story of San Francisco's Struggle to Provide a Water Supply for her Future Needs." The book is beautifully made, with fine typography and attractive full-page illustrations. It is an ornament to any bookshelf.

Mr. Taylor has been for years a student of public utility problems as these have been worked out in San Francisco. He has devoted himself very specially to the study of the water problem in this city—his studies having the advantage of combining historical research with practical, first-hand knowledge, the kind of knowledge accessible to a first-rate and conscientious reporter. The result is that he has written a book which will serve as a reference work for all who desire to acquaint themselves with the water problem of San Francisco and the conflicting influences that have modified that problem—now complicating it, anon simplifying it—through the years since water was first served to our citizens through pipes.

This first happened, says Mr. Taylor, when A. W. Von Schmidt, John Bensley and A. Chabot "organized the San Francisco Water Works on June 15, 1857, with Lobos

Creek as their supply. John Bensley was elected president."

After describing the first activities of this Bensley Company, Mr. Taylor gives the early history of Spring Valley, as follows:

"Bensley's scheme inspired one George H. Ensign to organize a company of his own. From the earliest period a spring of fresh water came out of the side-hill at a point on Mason Street, about 100 feet north of Washington and about 1,000 feet west of the Plaza (Portsmouth Square). This was the spring from which Juan Miguel Aguirre latterly secured his supply for his donkey and barrel system alluded to in the previous chapter.

"Ensign took the necessary steps to claim this water. In 1858 he got a franchise from the Legislature to lay down pipes. Owing to the fact that it did not run more than 5,000 gallons a day it was considered so insignificant that the provisions, usually included in the franchises of that period, for supplying water free for all municipal purposes, were omitted, with the exception that it might be drawn on for the extinguishment of fires. It resulted in years of litigation later on and was the cause of much indignation and bad feeling.

"Ensign with his franchise organized the Spring Valley Water Works for \$60,000. He spent a few dollars (not above \$25) in brick-ing in his fountain. He laid a few pipes. The next year A. W. Von Schmidt left his associates in the San Francisco Water Works. He had ambitions to bring in water from San Mateo County.

"Schmidt interested Abel Guy, Pioche Ayerque & Co., and E. L. Sullivan, and bought the franchise from Ensign of the Spring Valley Water Works. They also took over a small supply that had been introduced from Islais Creek by the Islais and Alinas Water Company. This company had built a dam across the creek near where the Mission Viaduct now is. The water was led in a flume around the hillside to a reservoir between Sixteenth and Seventeenth Streets. It now serves as the playground for the McK-Wilmerding School.

"The Spring Valley Water Works was strengthened still further by such men as J. F. Babcock, Charles Main, N. Luning, Edwin Davis, J. G. Kittle and C. L. Low. It was reorganized with a capital of \$3,000,000 with W. H. Tillinghast as its president; and plans were made for large extensions.

"These men secured the services of Hermann Schussler, a young engineer, born in a little village of Rastebe, in the Grand Duchy of Oldenburg, Germany. He had come to California but recently, fresh from the universities of Karlsruhe and Zurich. He had had some engineering experience in Switzerland.

"The choice of Schussler, while not realized at the time, was a momentous one for the City of San Francisco. He was a dominant figure in the affairs of the Spring Valley Water Company for fifty years. He developed the city's water system as it exists today. Upon his recommendations the Company little by little secured its vast holdings of over 100,000 acres of land.

"Schussler was sent into San Mateo County to create what is now Lake Pilarcitos. He built an earth dam across a small creek there in a short time. Later as the needs of the city grew he built another dam and created Lake San Andres; then the concrete dam which turned a beautiful valley into what is now Crystal Springs Lake, nine miles in length.

"The building of this large concrete structure was an achievement widely heralded throughout the country at the time. With modern methods the dam has been exceeded, but half a century ago no such structure had ever been built in this part of the country.

"As the demand grew he prospected the Lameda side of the bay for water. He discovered underground gravel supplies near

Sunol, where the Water Temple is. He secured these for the Company as well as the artesian supply near Pleasanton, and at Dumbarton laid the submarine pipes across the bay which bring this water into San Francisco.

"Simultaneously with the building of Lake Pilarcitos dam the Laguna Honda reservoir had been built in this city near the present Relief Home. A flume 18 by 30 inches conducted the water from Lake Pilarcitos into Laguna Honda. The completion of this work was heralded with a celebration."

After mentioning the absorption of the Bensley Company by Spring Valley, Mr. Taylor goes on to describe the acquisition by the Company of the Calaveras lands, and the city's first request, in 1875, that the Water Company fix a price for its properties. The Company asked \$15,500,000, and the city officials declined the offer as excessive. Following this came a series of contentions concerning water rates.

Out of these contentions was evolved by slow degrees a new relationship between public authority and public utilities. Mr. Taylor writes:

"It has been said that there is some truth on both sides of any argument. In other words, that one side is never wholly right and the other wholly wrong.

"In the differences between the people and the Spring Valley Water Works, continuing over many years, both sides believed that they were justified in their actions.

"In the lack of an arbiter who could deal with the subject of rates, it might be said, lay the germ of municipal ownership. Court actions were too slow and complicated to deal with the annual fixing of rates. The antagonisms that had been aroused, particularly on the side of the people, finally led to the provision contained in the present charter which provides for the gradual acquirement of all public utilities.

"It seemed to be the only solution for the ever recurring wrangle over rates. These wrangles finally were stilled with the change in the State Constitution in 1910. This change provided for the organization of the State Railroad Commission and conferred upon it the right to fix rates, to make valuations of public utility properties, and gave it other large arbitrary powers.

"It took many years of discussion before

the rights of the people or the corporations were determined fully. If, indeed, they can be said to have been definitely determined at the present moment. They were groping about without a compass in an effort to end the irksome tangle."

Mr. Taylor has discovered that the Hetch Hetchy was first studied as a source of water supply for San Francisco as early as 1882. To quote:

"A map was recently discovered on file at Sonora, capital of Tuolumne County, dated 1882, drawn by J. P. Dart, engineer, for the Tuolumne and San Francisco Water Company. It is now in possession of City Engineer O'Shaughnessy.

"The map shows a proposed diversion of water from the Tuolumne River at a point about fifteen miles northeast of Groveland, above the junction of the main Tuolumne River and the north fork. The water was to be conducted in an open ditch along the south side of the Tuolumne Canyon to a point near La Grange.

"From this point it was to be piped across the San Joaquin Valley passing near Oakdale and Lathrop, thence through the hills south of Antioch and Martinez to a reservoir between Martinez and Berkeley. (The present San Pablo reservoir of the East Bay Water Company has been built apparently at about the location selected by Dart as a reservoir site.)

"From this reservoir one main was to pass through the east side of Berkeley and Oakland to Bay Farm Island, thence under the bay to Hunters' Point into San Francisco.

"A branch of this main was to extend southeast from Oakland to Livermore and San Jose, while a branch from Lathrop would go north to Stockton and Sacramento."

But it was not until 1894 that Hetch Hetchy was formally called to the attention of the city authorities. In that year George M. Harris wrote a letter suggesting that the city acquire his rights in the Hetch Hetchy Valley and along the Tuolumne River for its entire length from the mountains to San Francisco Bay, for \$200,000. Nothing ever came of this, "but," as Mr. Taylor says, "the possibilities of the Hetch Hetchy had been pointed out."

By 1900 the city was definitely engaged

in estimating the possibilities of Hetch Hetchy. Meanwhile Spring Valley was again asked to make an offer of its properties. Says Mr. Taylor:

"An unfortunate paragraph in the communication caused resentment on the part of the Company. The supervisors in the resolution sent the Water Company said:

"The Spring Valley Water Company is also requested to bear in mind that any overvaluation of its water system will compel the people of San Francisco to look elsewhere for their water supply. And the withdrawing of San Francisco as market for the sale of the Company's water will reduce the value of the Company's lands to which they are worth for agricultural purposes merely.

"This paragraph drew a reply from the water company in which it said:

"It is not customary in ordinary negotiation that the buyer should demand a price for property based upon its alleged power of destruction.

"No offer was made at the time, as the Company said that the supervisors had not followed out the Charter provisions regarding the manner of acquiring a public utility.

After the fire of 1906, when Spring Valley's revenues were greatly depleted, the Board of Supervisors reduced water rates "making," says Mr. Taylor, "the situation even more critical for the Company. When the Company continued to collect the former rates, its franchises were forfeited." At that time a Citizens Committee, of which Colonel W. H. Heuer, U. S. A., was chairman, recommended the purchase of Spring Valley, but the supervisors ignored the recommendation.

During the early stages of the fight for Hetch Hetchy at Washington, Spring Valley opposed the city's representatives. Mr. Taylor says:

"Attorney Edward J. McCutchen and Hermann Schussler insisted that the municipal administration was attempting to wreck the Water Company in order that it might be bought up cheaply. They insisted rates had been reduced so that it was impossible for the Company to finance needed extensions. In addition to this they said the Hetch Hetchy project had been injected 'a big stick.'

In 1910, during the administration of P. H. McCarthy, the first Spring Valley purchase election was held. The proposal was to incur a bonded debt of \$35,000,000 to purchase all the Company's properties. The necessary two-thirds vote was not obtained. The vote was: Yes, [Continued on page 1



By lovely Pilarcitos—the footpath along the creek leads from the picnic ground, through a series of exquisite scenes, to the Stone Dam.

A Day at Pilarcitos

(Contributed)

PILARCITOS lies embosomed in the hills, its two arms of gleaming argent embracing the emerald ridges where the verdure runs from hill crown to water's edge. Only is the beauty of the lake, virgin its rests. Its silver expanse, more than a thousand acres, reflects daily a hundred moods of wind and sky, now gray beneath the morning and evening mists, placid as a mirror and as clear at noon, reflecting the turquoise sky; dimpling beneath the kiss of the breeze, surging to fury and rebellious wavelets in the rain storms of the warm, wet winters. The way to Pilarcitos lies by very pleasant places. Branching westward from the road that leads southward from San Francisco adown the Peninsula, the way leads across the dam at the southern end of the

San Andres Reservoir, a famous bulwark of earth cored with clay, the irregular curve of which shows proof of the elastic strength of the structure, which, lying directly in the fault of the earthquake of 1906, bent but did not break. The gate of Spring Valley Water Company opened; an upward climb commences through a region whose natural beauty has been changed only by the road that affords excellent grades for the motor car, and the telephone poles that stalk with giant strides across the hills. The road itself seems to hold sceptre over realms of rare beauty lying untouched, radiant in virgin loveliness, within twenty-five miles of San Francisco. Here in late June, mating quail run before the machine until the crested cock makes up his mind discre-

tion is better than bravery and flutters with his little brown sweetheart into the tangle. A turn in the road discovers deer, disconcerted but unalarmed, which gracefully bound up the slope and stand at gaze. Once on the trip a startled wildcat sprang for the upper bank and, snarling, glared defiance and disgust at the chugging car that had disturbed its breakfast-seeking stalk. The road is far more the highway of the wild, free things of the forest than of the men who made it.

At the first curve that turns towards the heart of the ridge forming the main peninsular watershed on the west crest of which lies Pilarcitos, the wind that blows free across a thousand leagues of ocean and that has met and conquered the barrier of the Coast Range, comes swooping through the pass with a strength that bids the stoutest motor slacken pace. Beneath, half hidden by the lower slopes, lying between the main ridge and its subsidiary hills, gleam the reservoirs, San Andres to the north, and, southward, Crystal Springs, part of the supply for the city that lies, its suburbs plainly visible, twenty miles northward as the crow flies. They lie like a mammoth serpent, thirteen miles in length, curving in and out between the wooded shores. Across the lesser

foothills the great Bay of San Francisco flashes like a silver shield beneath the sun that has just risen above the mountains of the mainland. On one of the ridges above stood the men of Gaspar de Portola in 1769 who, while deer-hunting, saw through some opening of the forest the welcome waters of the landlocked bay, and forgetting their quest for fresh venison, hastened back to their commander with the news of discovery.

Back of us the scene remains almost unchanged since the days of the first Governor of California. The lake of Pilarcitos, still bearing its Spanish name of "the water basin," has been enlarged by an artificial dam, but the hills are set with verdure that is seeded from the old, the same redwood still stand sentinel, the deer roam freely through the valleys and on the slopes, or lie on the ridges where the early sun awakes them.

Before us and to the left and right the years have made a mighty change. To the south the hills close out the view. Across the Bay, Mount Diablo looms but dimly through the morning mist, and Oakland and Alameda are but hinted at; but northward along the county road appear the outskirts of San Francisco, Millbrae, the cemeteries, Colma, and bayward, South San Francisco and the dot that marks the black gorge of the Bay Shore tunnels, piercing the hills that with Twin Peaks hide the city proper from our view. The fog, that, driven landward with the wind, hangs tangled in the forested crests behind us until the mounting sun disperses it, pours through the Golden Gate over the waters of the harbor as yet unwarmed by the sun; mantling the Mount Tamalpais in gray fleece. The early fire of San Francisco homes and factories contribute their quota to the gray canopy that hangs above the land and sea, though pierced already by the sun and soon to give place to a dome of cloudless blue.

The mounting luminary has awakened the land with the warmth of his embrace. The air is fragrant with the scent of blackberries and delicious wild strawberries, that slight search reveals, jewel-set with dew, sparkling amid leaves encrusted with diamonds. The spicy aroma of fern and flower, of oak and manzanita, pine and redwood, comes from the heights with the pungent scent of herbs and shrubbery, camisal, madrone, yer-



A natural wonderland is Pilarcitos, preserved through dedication to San Francisco's water supply.

santa, chaparral; the buckeye bears a thousand plumes of blossom, the air resounds with the music of a plumaged choir that sings from dewy spray and bough or pours out a morning song in mid-air. Quail call and fuzzy rabbits frolic, a coyote slinks like a ghost over the ridge, deer rise in stately laziness from their hilltop beds and start to graze, the young fawns frisking by their mothers, the bucks leading a bachelor existence once again.

Up and about the road winds till at a sudden turn the eastern arm of the lake comes into unexpected view. The fog that has retreated before us still stretches from hillcrest to hillcrest, but the sun has caught the under side and turned it to radiant opal. Trees come to the edge of the water and are mirrored in it, verging the lake with emerald. On the further ridge, above the dam, redwoods are massed in martial array, the lower streamers of the mist floating like pennons from their summits. The mist pall breaks up rapidly, now that the sun is well over the hills, blue sky peeps through the rapidly widening gaps, and by the time the dam is reached and the western arm discovered, perfect day has arrived amid the hills.

The reservoir of Pilarcitos was constructed in the early sixties and was then, through pipe and tunnel and conduit, thirty-two miles in total length; the principal source of supply to San Francisco. Its dam has been raised since its first construction and now holds back one billion gallons of water that eventually find their way to the San Andres Reservoir, two hundred and fifty feet below the Pilarcitos level of seven hundred feet.

Leaving the dam and following Pilarcitos Creek southward, the road traverses a tunnel of verdure. The speeding car runs beneath the arching trees in a green twilight through which the sunlight softly sifts, here and there dappling the way where the leafy curtain is less thick. The firm road is the only soil uncovered. Ferns are everywhere, the stream sings unseen beneath a thicket of vines and brambles and then breaks into merry music in the open as it plays comrade with the roadway for a little while.

Oaks and sycamores and madrone are here, interlacing their boughs above a thicket of a hundred shades of green, plummy with ferns, enameled with flowers, and set with luscious, sweet-smelling berries. Where the

watercourse cries "halloa" to the path, it glides crystal clear above its now pebbled, now sandy bed. Presently it is lost to view in a thicket of willows through which a deer crashes with light bounds as the motor is stopped where the road narrows to a foot-path leading to a stretch of water, sunlit, tree-shaded, across which kingfishers flash like living sapphires, chattering in anger at the intrusion. Here is the inimitable Pilarcitos picnic ground, made notable by a fountain of Arthur Putnam's design.

Around a bend is the Stone Dam, and the pool circles with trout and bass rising at a late breakfast. About the dam the deeper waters take a darker hue from the pines and redwoods that shadow them, and water flowing freely in midsummer from a flume gives indication of the hidden sources of supply. From the left of the dam issues a wide flume carrying the water by a zig-zag course to San Andres. To the right is the narrow inlet flume which branches off as it clings to the sides of the gorges and gathers the crystal waters that come laughing down the beds of little mountain brooks or tumbling over the rocky cliffs of never failing waterfalls.

Here and there in some deep canyon the trees open and a wondrous vista of the vast and verdant watershed is shown, lying ridge beyond ridge to the southward, across green groves to where the hills and the far distance melt into blue, but always the flumes, the tops of which form the only pathways through the gorges, reach out into hidden recesses where the tinkle of falling water sounds the presence of a living spring. As one nears the commencement of the flumes, built of redwood fifty years ago and holding in preservation many of the original timbers, now clinging to steep hillsides, now stilting it on tall trestles across leafy ravines, level with the tree tops; the sound of running water is heard everywhere. There it falls gleefully in a series of cascades over a slope of slippery granite forty feet high, the spray dashing into rainbows; here it gurgles with little bubbling, choking laughs from pool to pool, slapping at the boulders in miniature rapids, silent in still and shady spots, filtering through rocks till the percolation forms a lacy veil of silver over the face of the quartz, dripping in unseen places; a harmony to the rustle of the foliage, [Continued on page 10]



Above: Installing a new line from Laguna Honda Reservoir. A twenty-inch connection at Sixth Avenue and Lincoln Way between the twenty-four-inch cast iron and the new thirty-inch steel main, looking toward Golden Gate Park. Below: The new 36-inch steel main in Sixth Avenue, in the Sunset District, placed in the trench ready to be welded. Due to the sub-soil being sand, every foot of the trench had to be supported as shown.



Above: Forty per cent of San Francisco will benefit by the new line from Laguna Honda. The new 36-inch steel main in Sixth Avenue looking toward Golden Gate Park, showing the bridges required for automobiles. Below: Crossing the baseball field in Golden Gate Park. Work was started on a Monday morning, and by the following Saturday noon the ball ground was again in use.

[Continued from page 7] the harping of the breeze in the boughs, the call of the birds, the murmur of the shy world of the forest.

You can trace these smaller arteries of the system till, moss covered, they lose themselves in a jungle of ferns, tall woodwardias, and the graceful plumage of less stalwart though no less beautiful growths. The glens, the glades, the deeper forests, are riotous with vigorous life and leafage, born of the moist mists that never fail from sunset to sunrise, the rains that, wind-brought from the sea, surge over the ridges nearest the ocean and curl down into the Pilarcitos and Crystal Springs watershed, bringing an unvarying supply of the life blood of the land—water.

Here is the most beautiful portion of Cali-

fornia, unspoiled by man, a park of Nature's own making, where beings animate and inanimate reach the perfection for which they were intended; a land of fountains, streams and waterfalls and lakes, of fern and fruit and flowers, of trees and thickets, of sunlight and shadow, of peace and plenty. All day you may wander through the woods and by brooks and meet no human being save, by rare chance, a guard whose duty it is to see that trespassers beware. Here all things grow and live according to the plan of the Great Gardener; the rain, the dew, the fog find unpolluted way through rock, by leaf and limb and grass-blade to stream and spring and lake where lie waters limpid, clear enough to serve as dwelling-place for the most fastidious naiad, as bath for the most exacting of Dianas.

Laying Submarine Pipe-Lines in San Francisco

By O. G. Goldman, Assistant Superintendent, City Distribution

IN the year 1892 a twelve-inch cast-iron main was laid in Fourth Street and in Kentucky Street (now Third), from about the south line of the Channel to First Avenue South, now known as Arthur Avenue. Just

north of Arthur Avenue a stream was encountered, called Islais Creek, and here the main was laid on a trestle. Several years later a twelve-inch iron main was laid in Fourth Street running north toward Market, from the north line of the Channel.

In 1914, the authorities having decided to dredge Islais Creek and thus open it up to navigation, the pipe-line was cut and plugged on the north and south sides of the new waterway.

As the years passed and the district developed, the desirability, particularly for fire purposes, of having the twelve-inch main again connected across Islais Creek at Third Street, and in addition across the Channel at Fourth Street, became apparent.

It was therefore decided in 1925 to connect the main at the above locations, but due to the difficulty of getting the required material, the work was not undertaken until this year.

The depth of the water in the Channel as well as in Islais Creek, at the present time, is about twenty feet below mean low water, but future developments on both these waterways contemplate a depth of thirty feet. As ships, entering or leaving, might drag their anchors, it was decided that the pipe-line should be at least five feet below the mud-line after the contemplated developments



Assembling the 12" cast-iron main on the pontoons along-side of the wharf on Islais Creek at Third Street.



The submarine pipeline completely assembled and floated into place ready to be lowered, the end of the line being held in position by means of derrick barges.

were completed. This meant that the main would have to be placed at a depth of thirty-five feet below mean low water and therefore a trench would have to be excavated across these waterways having a depth of sixteen feet, and this was accomplished by means of a clam-shell dredger.

The pipe selected for these two submarine jobs was twelve-inch class "B," flanged cast-iron pipe; lead-packed flexible joints to be placed at proper intervals in the line. All bolts used in connecting the line together were of Tobin bronze and all gaskets were of sheet lead. The flexible joints were of the ball-and-socket type, with a movement of ten degrees from their center line.

Except in minor details, the work of laying the main across the Channel at Fourth Street and across Islais Creek at Third Street was identical. The entire length of the pipe-line which lay horizontal was first assembled on pontoons along the wharf-line. The main was suspended between the floats

of the pontoons, being held in place by means of rope slings fastened to the pontoon stringers, so that the entire section was, at all times, above the water. One end of the rope sling was made fast, while the other end was free to pay out when desired, the length of the rope being at least twice the depth of the water. After the horizontal section of the pipe-line was assembled, it was floated across the stream directly over the trench into which it was to be laid. The vertical sections of the main were then swung into place and held in the vertical position by means of derrick barges, and fastened to the horizontal section. The height of these vertical sections was such that when the main was lowered into place the ends would project at least a little above the water during the mean low water stage of the tide. Bends making an angle of forty-five degrees were used to bring the ends of the pipe-line to the desired location.

While the main was being held above the



Lowering the main at Third Street and Islais. The men on the pontoons are handling the rope slings supporting the pipe. The entire installation called for unusual ingenuity.



The pipeline at Fourth and Channel assembled on pontoons and ready to be moved into place.

water, blind flanges were placed on the ends. The line was then filled with water, by means of a hose connection, from the adjoining mains of Spring Valley Water Company, and subjected to the pressure of the system, which was sixty-five pounds per square inch.

The ball-and-socket joints were absolutely tight under these conditions, and any flanged connections which showed any inclination of leaking were drawn up until dry.

With the pressure on the line, the main was carefully lowered, one foot at a time, the ropes forming the slings supporting the pipe-line having been carefully marked for this purpose. When within two feet from the bottom of the trench, the alignment of the pipe-line was carefully checked, after which the main was lowered into place.

No attempt will be made to backfill the trenches. It was found, by soundings taken two weeks after the main was lowered into place in the Channel at Fourth Street, that it was covered with mud for about half the depth of the trench, or about eight feet.

The work of connecting the submarine pipe-lines to the system was not undertaken until a week after the main had been lowered, in order to allow for whatever settlement might take place.

The main across the Channel at Fourth Street has been in service for some time, and by the end of June the main across Islais Creek at Third Street was transporting water

to either side of the waterway, as required.

The work of excavating the trenches, as well as the assembling and lowering of the mains, was executed by the American Dredging Company of San Francisco, while the connecting of the two submarine sections to the system was done by the City Distribution Department of Spring Valley Water Company.

The Pioneer Prohibitionist

NEARLY every day for forty-two years he wheeled down Market Street in his shabby barouche, turning his benign countenance upon the passers-by. The gloss of his stovepipe hat, the luster and expanse of his Mosaic beard, his Darwinian brow and conscious dignity—these proclaimed him a being out of the ordinary.

Posterity has now forgotten Dr. Henry D. Cogswell. In San Francisco alone he had seven statues put up in his honor. If fame is to be adjudged by the total tonnage of statuary a man gets, then the Doctor was more famous than Pompey and Queen Victoria put together.

He willed \$100,000 to be expended in publishing his biography, written by himself. Yet there is hardly a line about him in the libraries. At least he should have had a page in California history, for he was the first dentist to ply his craft in San Francisco.

Dr. Cogswell came here in 1849 from Connecticut, and with a capital of three thousand dollars opened a dental office in a shack on California Street, near Montgomery. Miners flocked to him by the thousands to get their teeth plugged with the gold they had dug up themselves. Many insisted on having their molars pried out and replaced with teeth of solid gold, just for souvenirs. The young doctor had muscle, ambition, and enterprise, and prosperity was his speedy reward.

He invested his money in sand lots and had the extreme pleasure of watching his fortune grow to two million dollars. He retired early, and devoted himself to his avocation, which was preaching the gospel of temperance, for so prohibition was called in those days.

He went to halls, and pulling out the vox-

humana stop in his voice, rivaled John B. Gough in eloquence on the drink evil. He conceived the noble idea of planting the city with fountains, at the ratio of one for every hundred saloons.

It is to Dr. Cogswell's credit that he made a good start. In 1879 he presented to the city a fountain statue of Ben Franklin. It was unveiled at the corner of Kearny Street and Montgomery Avenue, just where the flat-iron building now stands. He addressed the crowd, and received the plaudits of the multitude and the thanks of the grateful city fathers.

Why should not art be the handmaiden of reform? Dr. Cogswell at once had an iron foundry in Bridgeport, Connecticut, turn out for him a score of fountains, with a statue of himself atop.

Meantime he gave to the people the Cogswell Polytechnic School, at the corner of Twenty-sixth Street and Folsom, at a cost of \$400,000, and with a heavy endowment. That was a noble deed. The Doctor was always unselfish. The number of kindly things he did unobtrusively was beyond counting. They far outweigh his vanity, a fault he shared with greater men.

The statues came. To save San Francisco the expense of setting up monuments to him after he was dead, he relieved her of the burden while he was alive. He set them up at Market and Drumm streets, at Bush and Battery, on Kearny Street near the Hall of Justice, at the Market Street entrance to the City Hall, at the Ferry Building, at the Haight Street entrance to Golden Gate Park, and elsewhere.

His fountain statues also sprang up like metallic fungi all over New England. One he presented to Brooklyn, for the City Hall

Park. The Brooklyn fathers wrote him a sarcastic letter. To this Dr. Cogswell replied in a document that was a masterpiece of noble and dignified remonstrance.

The statues were over life-size, depicting the Doctor in an appalling plug hat, with antebellum trousers, iron chin-drapes, and holding out a glass of water to the pedestrians. An iron dog, distorted with hydrophobia barked at the water, viewed from above by an iron pigeon that looked like a drosical parrot. Compared with a Cogswell statue, Lotta's Fountain was of exquisite beauty.

Horses reared in dismay when confronted with these specimens of Bridgeport art. Douglas Tilden, Bruce Porter, Jules Pages, Schmid, Gelett Burgess, and such highly sensitized persons clapped their hands over their eyes every time they passed one. And still the fountains went up. The apathetic Board of Supervisors accepted them all. The city roared with indignation. Newsboys, bond salesmen, flower-sellers, policemen, merchants, editors—all signed petitions of violent protest. What could the city fathers

do? They didn't want to hurt Dr. Cogswell's feelings.

One night in the fall of 1895 a group of artists singing the "Marseillaise" marched from Coppa's restaurant, in the Latin Quarter, to the gore of Bush and Battery, and lassoing a Cogswell statue around the hat, brought it crashing to the ground.

That Amedée Joulin, John A. Stanton, Ernest Peixotto, and Burgess, who chanted of the exploit afterwards in deathless verse, were the iconoclasts, is a charge that has not been refuted.

Dr. Cogswell grieved gently. He punished San Francisco by withdrawing his gift of two more statues and giving one each to San Jose and Pacific Grove.

What, fellow citizens, has become of all our iron Cogswells? This rediscoverer has not been able to find a single one.

Old Ben Franklin, however, is in Washington Park, in the heart of the claret belt, silently espousing the old dentist's cause. On the plinth are carved the words: "California Champagne—Water."

—IDWAL JONES: "Rediscovering San Francisco," in *San Francisco Examiner*.

A History of the Water Supply

[Continued from page 4] 22,068; No. 11,722. Mayor Rolph took office in January, 1912. A month later he initiated another attempt to purchase Spring Valley. His Advisory Water Committee, headed by Judge Curtis H. Lindley, recommended an offer of sale for \$38,500,000 be submitted to the voters. The supervisors thought the price should be \$37,000,000. The project fell through.

Another attempt was made in 1915. This time lands not used or useful were excluded, and the price was fixed at \$34,500,000, plus one-half of the \$2,000,000 then impounded under rate suits. The favorable vote was insufficient to authorize the bonds. It stood: For purchase, 39,951; against, 33,455.

The latest attempt was made in 1921 with the price of the properties desired fixed at \$37,000,000. "Four mayors of San Francisco," says Mr. Taylor, "endorsed the purchase. These were James D. Phelan, Edward Robeson Taylor, P. H. McCarthy, and James Rolph, Jr." Again the project failed of the

necessary two-thirds vote. The vote stood: For purchase, 43,073; against, 30,992.

Throughout this volume Mr. Taylor exhibits a fine impartiality in dealing with matters of controversy. Most of the controversial matters are "old, unhappy, far-off things," yet by the prejudiced and by the ill-informed they can readily be made to assume an importance in connection with present problems. It is strange, yet true, that many who thoroughly understand the development of business in general are prevented by some curious complex from taking cognizance of the development of public utility business in the last twenty years. They do not attach the proper importance to the conditions that have arisen since the doctrine of "monopoly with regulation" has been worked out by public authority, primarily to serve the public and secondarily to permit utilities to earn a reasonable return. Mr. Taylor does not belong to this school of thought. He is abreast of the times. [Continued on page 15]

SAN FRANCISCO WATER

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EDWARD F. O'DAY, *Editor*

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ATTENTION is respectfully directed to the verses about Lake Merced by Mr. Miles Overholt, of the Examiner, reproduced in fac-simile in this issue of SAN FRANCISCO WATER. So far as the editor knows, this is the first lyric ever inspired by any unit of the Spring Valley system.

Considering the number of beauty spots scattered over the Spring Valley properties on both sides of the Bay, it is rather surprising that the verse-makers have never felt the impulse to celebrate any of them. Surely the Water Temple is worthy of the poet's pen. Surely there is the genuine stuff of poetry in Pilarcitos (to which a prose-poet addresses himself in this issue). If a poet ever surveyed the skyline of San Francisco from University Mound Reservoir, would he not be moved to sing the splendor of the spectacle? When Irvin S. Cobb toured the Spring Valley properties in 1915, he declared that the loveliness of many spots that were pointed out to him was a spur to his imagination. But no poet except Mr. Overholt has discovered any of these first aids to the "divine afflatus."

Of course no true poet can be expected to wax ecstatic over pipe-lines and pumping stations, important as these undoubtedly are. But is there no fillip to the poetic faculty in the Jepson Laurel? Does the Stone Dam leave the minstrel cold?

Let us hope that Mr. Overholt's charming precedent will be followed.

* * *

History of the Water Supply

[Continued from page 14] This is how he summarizes the situation:

"Those who have followed the history of the troubles between the Water Company

and the city during the preceding pages will realize that there were two main causes of trouble and dissatisfaction. These were:

"First—On part of the people: Inadequacy of supply and rate charged by the Company.

"Second—On part of the Company: The inadequacy of rates allowed by the supervisors.

"Throughout all the later years of litigation the Company had complained that the latter was responsible for the lack of supply. The Spring Valley contended that because of the low rates fixed by the supervisors it was unable to finance the extensions and betterments needed to keep ahead of the demand.

"With the advent of the State Railroad Commission that body took the position that if corporations had to finance betterments and give the service demanded, they must be placed in a position of earnings sufficient to make their securities marketable.

"The Supreme Court had held that less than a 6 per cent return was confiscatory. The State Railroad Commission by being slightly more liberal and allowing corporations to earn between 7 and 8 per cent made it possible for utility companies to find a ready sale for securities and finance improvements in advance of the actual need. . . . "It was not until 1916 that the State Railroad Commission actually took over the fixing of water rates in San Francisco. While the commission had been in existence for a number of years, the Water Company was collecting rates in excess of those fixed by the Board of Supervisors under a Federal court order. With the termination of that action, whereby the Water Company was awarded over \$2,000,000 in impounded moneys, the State Railroad Commission took up the work.

"Not only have the rates fixed by the commission been satisfactory, but the commission has been recognized as the general arbiter on these and allied matters to such an extent that appeal to the courts has not been resorted to since the commission took charge."

Mr. Taylor put the making of his book into the capable hands of Ricardo J. Orozco who embellished it with fine typography and ornaments taken from Sixteenth-Century originals. It makes an imposing volume and is priced at ten dollars.



LAKE MERCED

It took me a day to go there,
 It took me a day to come back,
 And I thought I was heading for nowhere,
 I thought I was clear off the track.
 But just at the edge of a sand dune,
 And just at the edge of the sea,
 Deep voices that rolled like a band tune
 Came rumbling and grumbling to me:

"Merced!" they said;
 "Ahead—Merced!
 Merced ahead—
 Merced!" they said.

It took me a day to go there
 Because of the lingering views,
 For wondrously sweet zephyrs blow there,
 And the hills are of gorgeous hues.
 But it's worth all the time you can spare it
 A jewel that gleams like a star;
 A gem—and the town's proud to wear it—
 While the frogs sing its praise afar.

"Merced!" they said;
 "Ahead—Merced!
 Merced ahead—
 Merced!" they said.

—MILES OVERHOLT.

Through the courtesy of the author, Mr. Miles Overholt, this poem, one of a series celebrating the distinctive places of San Francisco, is given here in fac-simile as it appeared in the San Francisco Examiner, because it interprets the soul of a beautiful part of our water supply.

SPRING VALLEY WATER COMPANY

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THE ORIGIN
OF MOUNTAIN
STREAMS IS
LIKE THE
ORIGIN OF
TEARS · PATENT TO THE
UNDERSTANDING · BUT
MYSTERIOUS TO THE SENSE

— THE LAND OF LITTLE RAIN
BY MARY AUSTIN



E SAN CARLOS ENTERS SAN FRANCISCO BAY • AUGUST 5 • 1775

SAN FRANCISCO Water



AS SOON as the expedition halted, a great many of the pagans came in, making signs of friendship and expressing their pleasure at our arrival. Their good-will was greatly increased when they saw with what courtesy we treated them, and when they received the little presents which we gave them of beads and trinkets to attract them, and also of our food. They continued to visit us frequently, bringing us presents of small value, principally shell-fish and grass-seeds. . . . In the exploration which we made we found that we were on a peninsula without other exit or entrance than to the southward and southeast, as on every other side we were surrounded by salt water. On the east we had the inlet which extends to the southeast, although as it is only about three leagues wide we could easily see the land and the mountains on the other side. To the north stretched away another arm of the sea and on the west and south was the great Pacific Ocean with the roadstead of the Farallones at the mouth or entrance of the port.

*

FR. FRANCISCO PALOU'S DESCRIPTION
OF THE PENINSULA OF SAN FRANCISCO
AS HE SAW IT JUNE 27, 1776.

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The Founding of San Francisco

By the Editor

THIS year, and at this season, San Francisco celebrates the one hundred and fiftieth anniversary of its birth. Ours is an old city, as age is reckoned in the West, and the story of the beginning has the glamour not only of age but of romance. The port of San Francisco, from the time of its discovery, assumed a very definite importance in international politics; so our beginnings have also a special historical significance.

Three great powers—Spain, England, and Russia—sought domination on the Pacific Coast, and regarded San Francisco as the key to success. Spain won, and to that fact we owe the peculiar richness of our background. Reading the story of the founding of San Francisco, there is always a sense of pageantry hovering over the page. Those Spanish soldiers, those Franciscan padres did things in a ceremonious and gallant fashion. We have never quite lost their manner. It is to be hoped that we never shall.

The great names in the story of the founding are Bucareli, viceroy of New Spain; Anza, the intrepid explorer, the wise colonist; and Serra, the president of the missions, whom David Atkins, a Californian poet, has called "soldier of Christ, adventurer, artist and engineer." The story is well known, but one does not tire of it.

On the fifteenth of December, 1774, Viceroy Bucareli sent from Mexico City a very important letter to Father Junípero Serra at Monterey.

"In consideration," he wrote, "that the port of San Francisco, when occupied, might serve as a base for subsequent projects, I have resolved that the founding of the fort

should take place by assigning twenty-eight men under a lieutenant and a sergeant. As soon as they are in possession of the territory, they will be sure proof of the king's dominion. For this purpose Captain Juan Bautista de Anza will take a second expedition overland to Monterey from Sonora, where he must recruit the said troops. He will see that they take their wives and children along so that they may become attached to their domicile. He will also bring along sufficient supplies of grain and flour, besides cattle. . . . When the territory has been examined, and the presidio is established, it will be necessary to erect the proposed missions in its immediate vicinity."

This was the first move in the grand project of founding San Francisco.

Bucareli's letter was delivered to Father Serra by Captain Juan Bautista de Ayala, who arrived at Monterey on the twenty-seventh of June, 1775, in command of the "San Carlos," also known as "The Golden Fleece." This vessel is pictured on the cover of SAN FRANCISCO WATER. Captain Ayala had orders from the viceroy to survey the port of San Francisco in conjunction with the land expedition from Sonora under Captain Anza.

On the night of August 4, 1775, Ayala brought the "San Carlos" safely through the Golden Gate; so he has the immortal distinction of being the first navigator to enter our port. Both San Francisco and Suisun bays were carefully surveyed. Near one inlet of our bay three Indians were seen weeping; so this inlet was named La Ensenada de los Llorones—the Bay of the Weepers. Later



Father Junipero Serra, president of the missions of Alta California, whose dearest dream came true when the Mission Dolores, dedicated to the patron saint of the Franciscan Order, was founded

this became Mission Bay. Ayala remained here for forty days, and the land expedition under Anza not arriving, he returned to Monterey.

Meanwhile Captain Bruno de Heceta came from Monterey to make additional surveys. Fathers Palou and Campa y Cos accompanied him to select a site for the Mission of San Francisco. This expedition ascended Sutro Heights, Point Lobos, and Fort Point. Camp was made on the shore of a lake which was named, on account of the feast day, Nuestra Señora de la Merced. This, of course, was Lake Merced. Heceta expected to make connections with Ayala, but failing to do so, returned to Monterey.

On September 29, 1775, in compliance with the order of Bucareli, Anza set out

from Sonora, Mexico, for San Francisco. His party consisted of 177 persons, including women and children. He had a pack-train of 120 mules. After the great Anza himself, the outstanding members of this expedition were Lieutenant Moraga, and Father Font, who kept an invaluable diary.

Captain Rivera, who was charged with the execution of the viceroy's orders, was not friendly to Father Serra, and to embarrass him detained the Anza party indefinitely at Monterey. For this he was shortly afterward removed from Monterey to Lower California by the indignant Bucareli.

But while the expedition was halted, Anza was not to be thwarted. His party had arrived in Monterey on March 10, 1776. On the twenty-second, taking with him Moraga, Father Font, and a squad of soldiers, he started for San Francisco. Father Font has this entry for March 27:

"The day broke clear and bright. At seven in the morning we set out from the little creek a short distance north of San Mateo Creek, and at eleven, having marched about six leagues, we pitched camp at a lagoon or spring of clear water close to the mouth of the port of San Francisco."

This was Mountain Lake at the Presidio.



Antonio Maria Bucareli y Ursua, the great viceroy of New Spain, who initiated the founding of San Francisco and whom the historian Chapman calls "the greatest hero who has ever appeared in the field of California history"

Anza, Moraga, and Font went to Point Lobos, then to our Fort Point—*Cantil Blanco* they called it—and examined the port.

"I beheld," writes Father Font, "a prodigy of nature, which it is not easy to describe. . . . We saw the spouting of young whales, a line of dolphins or tunas, besides seals and otters. . . . This place and its surrounding country afforded much pasturage, sufficient firewood, and good water, favorable conditions for establishing the presidio or fort contemplated. Only timber was lacking, as there was no tree on those heights; but not far away were live oaks and other trees. The soldiers chased some deer, but secured not one. Of these animals we saw many today."

They were drawn back to the spot next day, and Father Font was more enthusiastic than ever. "From this tableland," he writes, "one enjoys a most delicious view; for from there one observes a good part of the bay and its islands as far as the other side, and one has a view of the ocean as far as the Farallones. In fact, although, so far as I have traveled, I have seen very good places and beautiful lands, I have yet seen none that pleased me so much as this. I do believe that, if it could be well populated, as in Europe, there would be nothing more pretty in the world; for this place has the best

Plan de la Boca del Puerto de San Francisco, situado en 37° 49'



Padre Font's map of the entrance to San Francisco Bay, facsimile of a drawing that accompanied his invaluable diary. In olden days the Pacific Ocean was called "Mar del Sur," or South Sea.

accommodations for founding on it a most beautiful city, inasmuch as the desirable facilities exist as well on the land as on the sea, the port being exceptional and capacious for dockyards, docks, and whatever would be wanted.

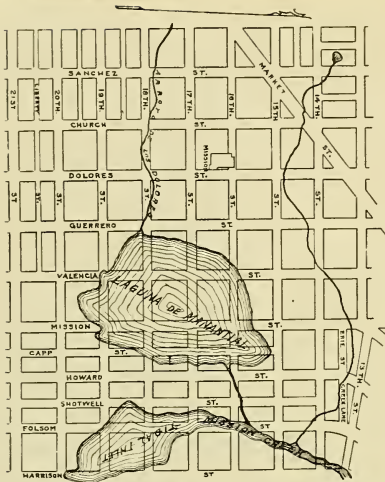
"This tableland was designated by the commander as the site of the new colony and fort which were to be established at this port; for on account of its height it commands such a dominating position that it can defend the entrance to the port at gunshot. At the distance of a gunshot it has water for the maintenance of the population, namely, the spring or lagoon where we camped."

Father Font is not to be blamed for thinking that Mountain Lake would be a sufficient water supply. Almost a century later certain San Franciscans made the same mistake, and did not discover their error until they had spent considerable money.

Next day, Friday, the twenty-ninth of March, Anza and Father Font explored the peninsula in another direction. "We rode,"



Don Juan Bautista de Anza, captain of the Presidio of Tubac, who selected the site for the Presidio of San Francisco, and who set an example of intrepidity in exploration and wisdom in colonization.



All trace of Laguna de Manantial, also called Laguna de los Dolores, has disappeared. Eldredge, who drew this map, says: "The Laguna de los Dolores covered the present city blocks bounded by Fifteenth, Twentieth, Valencia, and Howard streets. It was on this filled land of the ancient laguna that the earthquake of April 18, 1906, did such damage, wrecking buildings and causing loss of life. The Arroyo de los Dolores had its rise in Los Pechos de la Choca (The Breasts of the Indian Girl)—now Twin Peaks—and flowed down about the line of Eighteenth street into the laguna."

says Font, "about one league to the east, one to the east-southeast, and one to the south-east, going over hills covered with bushes, and over valleys of good land. We thus came upon two lagoons and some springs of good water, meanwhile encountering much grass, fennel, and other good herbs. We then arrived at a lovely creek, which because it was the Friday of Sorrows we called the Arroyo de los Dolores.

"On the banks of the Arroyo de los Dolores we discovered many fragrant chamomiles and other herbs, and many wild violets. Near the streamlet the lieutenant (Anza) planted a little corn and some garbanzos in order to try out the soil, which to us appeared good. As for me, I judged that this place was very fine, and the best for establishing on it one of the two missions. . . . We moved a little, and from a slight elevation I observed that the direction of the bay was toward the east-southeast. Near this hill, in the direction of the bay, there is a good piece of level land, into which the Arroyo de los Dolores enters suddenly like a falls

as it emerges from the hills. By means of its water all the land could be irrigated, and at the falls, which is very suitable for the purpose, a mill could be operated."

On the eighth of April Anza's little party of exploration was back in Monterey, and a few days later Anza departed for Sonora. All this time the large party of colonists that Anza had brought from Sonora was detained in Monterey through the whim of Rivera. Just before being removed for his misconduct, Rivera ordered Lieutenant Moraga to proceed to the port of San Francisco with twenty soldiers and to erect the presidio on the spot selected by Anza. He directed that the founding of the mission be postponed.

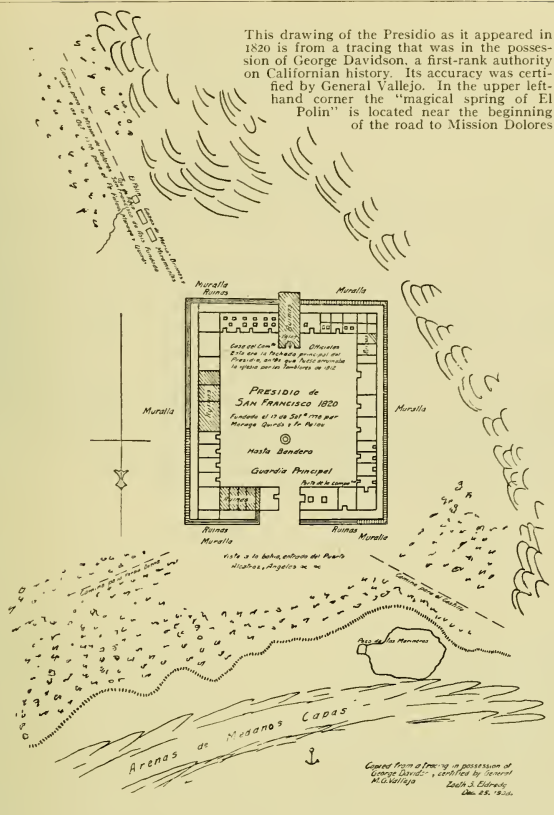
On the third of June, the "San Carlos" arrived at Monterey, and under orders from Viceroy Bucareli, took aboard the property of the soldiers and colonists, church and household furniture and farm implements—everything intended for the new presidio and mission.

On June 17 Lieutenant Moraga left Monterey for San Francisco with Sergeant Grijalva, two corporals, sixteen soldiers, seven colonists, and five Indians in charge of pack-mules and two hundred head of cattle. The soldiers and settlers had their wives and children with them. Father Serra sent along Father Palou and Father Cambon. Father Palou is the historian of this memorable party.

"On June 27," writes Father Palou, "the expedition arrived near its destination. The commander, therefore, ordered the camp to be pitched on the bank of a lagoon which Señor Anza had named Nuestra Señora de los Dolores, and which is in sight of the Ensenada de los Llorones, and of the bay or arm of the sea that extends to the south-east. Here all were to await the transport ship to mark out the site on which to locate the fort and presidio while the country was being explored."

On June 29, 1776, Fathers Palou and Cambon said mass in a rude arbor at the Dolores camp; so this is taken by historians as the date of the foundation of the Mission of San Francisco of Assisi, or Mission Dolores. It was just five days before the Declaration of Independence.

The padres were naturally interested in the condition of the Indians whom they had come to convert. Father Palou's account is



not complimentary. He writes: "The natives here are all well formed. Many of them have beards, others are hairless and rather ugly. They are accustomed to tear out by the roots the hair of the eyebrows, and this renders them ugly. They are poor Indians without more of a house than a hedge of ranches to protect them somewhat against the high winds which prevail and which molest them very much. The men go entirely naked, except that they cover the shoulders with a sort of small cape pieced together from otter skins and pelican feathers. The women cover themselves with nothing but awls strung together around the waist."

On July 26, the "San Carlos" not yet

having arrived from Monterey, Lieutenant Moraga moved his camp from the Laguna de los Dolores to the north end of the peninsula and set about the erection of temporary accommodations. The first structure was a chapel of tules, and there Father Palou said mass on July 28, and this is the first date in the history of our presidio. Meanwhile, despite Rivera's order to the contrary, Moraga detailed some of his men to start building at Mission Dolores.

The "San Carlos" sailed through the Golden Gate—her second entrance into the port of San Francisco—on August 18. Work at the presidio now began in real earnest, the plan being drawn by José Canizares,



Fort Point used to be Punta del Cantil Blanco, and the old Spanish fort was called Castillo de San Joaquin. This was built of adobe, with embrasures lined with brick. The parapet was ten feet thick. It mounted eight nine-pounders. Finished in 1794, it cost about sixty-four hundred dollars

pilot of the "San Carlos." This plan called for an enclosure ninety-two varas, or two hundred and fifty-three feet, square. Inside this, and built of palisades and tules, were to be the chapel, officers' quarters, warehouse, guardhouse, and barracks for the soldiers and colonists, with their families. A house for the commander was also started.

By the middle of September all these buildings were well under way, and formal possession of the Presidio of San Francisco was celebrated on the seventeenth of September, 1776. This was an impressive ceremony. Every Spaniard who could be spared from duty on shore and on the "San Carlos" was present. Father Palou writes:

"After the holy cross had been planted, blessed, and venerated, I sang the first solemn mass with deacon and subdeacon. Thereupon the officers performed the ceremony of taking formal possession in the name of our sovereign. All then entered the church and sang the *Te Deum Laudamus*, accompanied by the ringing of bells, the salvos of cannon, pistols, and muskets, to which the transport in the harbor responded with its guns. This discharge of firearms and cannon, and the sounding of bells at

the same time, doubtless terrified the savages, for they did not allow themselves to be seen for many days. When this function was concluded, the commander of the presidio assembled all the people and displayed all the liberality the situation permitted."

Meanwhile Lieutenant Moraga and Captain Quiros of the "San Carlos" saw no reason why work should not proceed at the mission. They had men to spare from the work at the presidio, and these were sent to build a mission chapel and a dwelling for the padres. Says Father Palou: "In a short time a building was completed which measured ten varas [or twenty-eight feet] in length, and five varas [fourteen feet] in width. This structure was of wood plastered over with clay and roofed with tules. To this was built of the same material a church eighteen varas [about fifty feet] long. Adjoining it, in the rear of the altar, was a small room which served as a vestry."

The chapel was solemnly blessed on the third of October, the day before the feast of St. Francis of Assisi, and on the eighth the formal opening of the mission was celebrated in much the same fashion as the opening of the presidio.

San Francisco in 1816

The following description of San Francisco is taken from a French work, by Louis Choris, published in Paris in 1822. The author visited San Francisco on "The *Ruric*," in the capacity of artist to the voyage of exploration under command of Otto von Kotzebue. Dr. Eschscholtz, in whose honor the California poppy received its botanical name, was the physician for "The *Ruric*."

The translation of the Choris narrative was made by Porter Garnett and published in 1913 in a little volume entitled "San Francisco One Hundred Years Ago." Permission to reprint here was kindly extended by the publisher, Alexander M. Robertson, of San Francisco.

EARLY on September 20, 1816 (old style, October 2), we came within sight of the coast of New California. The land we first saw was what is known as Point Reyes, to the north of San Francisco. As the wind was favourable we soon passed the Farallones, which are dangerous rocks, and at four in the afternoon we entered San Francisco harbour. The fort, which is within the entrance and on the south shore, is thoroughly equipped for defense. The presidio of San Francisco is about one marine mile from the fort and on the same side; it is square in form

and has two gates which are constantly guarded by a considerable company of men. The buildings have windows on the side towards the interior court only. The presidio is occupied by ninety Spanish soldiers, a commandant, a lieutenant, a commissary, and a sergeant. Most of these are married. The men and women are tall and well built. Very few of the soldiers have married Indians. They are all good horsemen and two of them can easily cope with fifty natives.

Two leagues to the southeast of the presidio and on the southern shore of the harbour is the Mission of San Francisco, which makes a fair-sized village. The mission church is large and is connected with the house of the missionaries, which is plain and reasonably clean and well kept. The mission always has a guard of three or four soldiers from the presidio. The village is inhabited by fifteen hundred Indians; there they are given protection, clothing, and an abundance of food. In return, they cultivate the land for the community. Corn, wheat, beans, peas, and potatoes—in a word, all kinds of produce—are to be found in the general ware-



Quaranta habitantes de Colofre en la mission de S. Francisco.

The Indians of Mission Dolores celebrating a holiday with their native dance



The San Francisco Indians were inveterate gamblers, and are shown here playing a game described by Choris

house. By authority of the superior, a general cooking of food takes place, at a given hour each day, in a large square in the middle of the village; each family comes there for its ration, which is apportioned with regard to the number of its members. They are also given a certain quantity of raw provisions. Two or three families occupy the same house. In their free time, the Indians work in gardens that are given them; they raise therein onions, garlic, cantaloupes, watermelons, pumpkins, and fruit trees. The products belong to them and they can dispose of them as they see fit.

In winter, bands of Indians come from the mountains to be admitted to the mission, but the greater part of them leave in the spring. They do not like the life at the mission. They find it irksome to work continually and to have everything supplied to them in abundance. In their mountains, they live a free and independent, albeit a miserable existence. Rats, insects, and snakes,—all these serve them for food; roots also, although there are few that are edible, so that at every step they are almost certain to find something to appease their hunger. They are

too unskillful and lazy to hunt. They have no fixed dwellings; a rock or a bush affords sufficient protection for them from every vicissitude of the weather. After several months spent in the missions, they usually begin to grow fretful and thin, and they constantly gaze with sadness at the mountains which they can see in the distance. Once or twice a year the missionaries permit those Indians upon whose return they believe they can rely to visit their own country, but it often happens that few of these return; some, on the other hand, bring with them new recruits to the mission.

The Indian children are more disposed to adopt the mission life. They learn to make a coarse cloth from sheep's wool for the community. I saw twenty looms that were constantly in operation. Other young Indians are instructed in various trades by the missionaries. There is a house at the mission in which some two hundred and fifty women—the widows and daughters of dead Indians—reside. They do spinning. This house also shelters the wives of Indians who are out in the country by orders of the fathers. They are placed there at the request of the In-



Indians of the Tcholonovi tribe hunting on the shore of San Francisco Bay

dians, who are exceedingly jealous, and are taken out again when their husbands return. The fathers comply with such requests in order to protect the women from mischief, and they watch over this establishment with the greatest vigilance.

The mission has two mills operated by mules. The flour produced by them is only sufficient for the consumption of the Spanish soldiers who are obliged to buy it from the fathers.

The presidio frequently has need of labourers for such work as carrying wood, building, and other jobs; the superior, thereupon, sends Indians who are paid for their trouble; but the money goes to the mission, which is obliged to defray all the expenses of the settlement.

On Sundays and holidays they celebrate divine service. All the Indians of both sexes, without regard to age, are obliged to go to church and worship. Children brought up by the superior, fifty of whom are stationed around him, assist him during the service, which they also accompany with the sound of musical instruments. These are chiefly drums, trumpets, tabors, and other instruments of the same class. It is by means of their noise that they endeavour to stir the imagination of the Indians and to make men of these savages. It is, indeed, the only means of producing an effect upon them. When the drums begin to beat they fall to the ground as if they were half dead. None dares to move; all remain stretched upon the ground without making the slightest movement until the end of the service, and, even

then, it is necessary to tell them several times that the mass is finished. Armed soldiers are stationed at each corner of the church. After the mass, the superior delivers a sermon in Latin to his flock.

On Sunday, when the service is ended, the Indians gather in the cemetery, which is in front of the mission house, and dance. Half of the men adorn themselves with feathers and with girdles ornamented with feathers and with bits of shell that pass for money among them, or they paint their bodies with regular lines of black, red, and white. Some have half their bodies (from the head downward) daubed with black, the other half red, and the whole crossed with white lines. Others sift the down from birds on their hair. The men commonly dance six or eight together, all making the same movements and all armed with spears. Their music consists of clapping the hands, singing, and the sound made by striking split sticks together, which has a charm for their ears; this is finally followed by a horrible yell that greatly resembles the sound of a cough accompanied by a whistling sound. The women dance among themselves, but without making violent movements.

The Indians are greatly addicted to games of chance; they stake their ornaments, their tools, their money, and, frequently, even the clothing that the missionaries have given them. Their games consist of throwing little pieces of wood which have to fall in an even or in an odd number, or others that are rounded on one side, and as they fall on the flat or on the round side the player loses or wins.

Upon the demise of his father or mother, or of some kinsman, the Indian daubs his face with black in token of mourning.

The missionaries have characterized the people as lazy, stupid, jealous—gluttons, cowards. I have never seen one laugh. I have never seen one look one in the face. They look as though they were interested in nothing.

It is reckoned that there are more than fifteen Indian tribes represented in the mission. The Kulpuni, Kosmiti, Bolbones, Umpini, Lamanes, Pitemens, and Apatamnes speak one language and live along the Sacramento River. The Guimen, Utchiuns, Olompalis, Tamals, and Sonomas likewise speak one language. These tribes are the most

largely represented at the Mission of San Francisco. The Saklans, Suisuns, Utulaines, and the Numpolis speak different languages. Another tribe, the Tcholononi, differ considerably in feature, in general physiognomy, and in a more or less attractive exterior from all the others. These live in the mountains. They have formed an alliance with the Spaniards against all the Indian tribes. They make beautiful weapons, such as bows and arrows. The tips of the latter are furnished with pieces of flint fashioned with great skill.

Severe fevers occur constantly among the Indians. These maladies commonly carry off a very great number. Several missions in Lower California have gone out of existence in the past twenty years by reason of the extinction of the Indians.

The Indians at the missions to the south of San Francisco—particularly that of Santa Barbara—make charming vessels and vase-shaped baskets, capable of holding water, from withes of various running plants. They know how to give them graceful forms, and also how to introduce pleasing designs into the fabric. They ornament them with bits of shell and with feathers.

The Indians build their canoes when they are about to undertake an expedition on the water; they are made of reeds. When they get into them they become half filled with water, so that the occupant, when seated, is in water up to the calves of his legs. They propel them by means of long paddles having pointed blades at both ends.

The missions of San Francisco, Santa Clara, San José, and Santa Cruz depend upon the presidio of San Francisco, which is required to succor and assist all the fathers and to furnish them with soldiers when necessary—particularly to accompany them upon excursions into the country. One such expedition, consisting of two fathers and twelve soldiers, returned a short time before our arrival. It had been their intention to ascend the Sacramento River, which empties into the bay to the northeast of the mission. But the Spaniards met parties of armed men at every turn; nowhere were they well received. They were compelled therefore to return after fifteen days without having made any progress towards the end in view.

The rocks near the bay of San Francisco are commonly covered with sea-lions. Bears

are very plentiful on land. When the Spaniards wish to amuse themselves, they catch them alive and make them fight with bulls.

Sea-otters abound in the harbour and in the neighbouring waters. Their fur is too valuable for them to be overlooked by the Spaniards. An otter skin of good size and of the best quality is worth \$35 in China. The best grade of skins must be large, of a rich colour, and should contain plenty of hairs with whitish ends that give a silvery sheen to the surface of the fur.

Russians from Sitka (Norfolk Sound), the headquarters of the Russian-American colony, are established at Bodega Bay, thirty miles north of San Francisco. Their chief in this new settlement is M. Kuskof, an expert fur-trader. They are thirty in number and they have fifteen Kadiaks with them. They have built a small fort which is equipped with a dozen cannon. The harbour will admit only vessels that draw eight or nine feet of water. This was formerly a point for the selling of smuggled goods to the Spaniards. M. Kuskof actually has in his settlement horses, cows, sheep, and everything else that can be raised in this beautiful and splendid country. It was with great difficulty that we obtained a pair of each species from the Spaniards because the government had strictly forbidden that any be disposed of.

M. Kuskof, assisted by the small number of men with him, catches almost two thousand otters every year without trouble. When not so engaged the men are employed at building and in improving the settlement. The otter skins are usually sold to American fur-traders. When these fail of a full cargo, they go to Sitka, where they obtain skins in exchange for sugar, rum, cloth, and Chinese cotton stuff. The Russian company, not having a sufficient number of ships, sends its own skins to China (or only as far as Okhotsk) as freight on American ships.

Two hundred and fifty American ships, from Boston, New York, and elsewhere, come to the coast every year. Half of them engage in smuggling with enormous profit. No point for landing goods along the entire Spanish-American coast bathed by the Pacific Ocean, from Chile to California, is neglected. It often happens that Spanish warships give chase to American vessels, but these, being equipped with much sail, having large crews, and [Continued on page 16]

SAN FRANCISCO WATER

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EDWARD F. O'DAY, *Editor*

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I NTERESTING testimony regarding the quality of Spring Valley water is embodied in a letter that came recently to the editor of SAN FRANCISCO WATER from Panama. The writer, a well-known San Franciscan, sends the following:

"I thought you might be interested in an unsolicited testimony which came to my attention a day or so ago, regarding the relative merit of Spring Valley water.

"Chief Officer Wey of this ship, which is a Royal Mail packet, the 'Lochgoil,' told me the other day that Spring Valley water is the best water on the Pacific Coast. I was interested as a San Franciscan, and drew him out to the following effect:

"Spring Valley water is by far the best on the Coast. When we tie up in San Francisco our tanks contain a mixture of waters taken on in every port from Colon to Vancouver, but we pump it all out and fill up with Spring Valley. Only once did we fill at —; but the first port we hit we not only emptied our tanks of it, but had to send a man down to clean out the mud—beastly stuff! Of course, I never drink water, but this particular water was too horrible to wash in."

"So you see Spring Valley will follow me to England, and I feel very much like the Count de Talleyrand, who took his own cow on his travels in order to suffer no change of milk.

"I thought this would interest readers of SAN FRANCISCO WATER. It did me! I suppose Don Bruno de Heceta thought the same thing when he landed with his water-casks at La Laguna de Nuestra Señora de la Merced."

* * *

THIS issue of SAN FRANCISCO WATER is largely devoted to the very earliest days of

San Francisco. The reason is that San Francisco is celebrating her Sesqui-Centennial. One hundred and fifty years ago the city was settled by a handful of Spaniards who founded the Presidio and the Mission. As years passed, and the population increased, the little pueblo of Yerba Buena took form. The growth was slow until 1848 and the discovery of gold in California.

By virtue of its situation on a magnificent harbor, San Francisco would have become a great city in any event, but American occupation of California and the lure of gold caused San Francisco to grow with amazing rapidity. The most imaginative Spaniard who came here in 1776 was incapable of dreaming that San Francisco in 150 years would be a city vastly larger than Seville in old Spain.

Spanish influence has always been felt in San Francisco. Our art, among other things, owes much to the inspiration that our artists derive from the Spanish background of San Francisco history.

The cover of this issue of SAN FRANCISCO WATER bears witness to this influence. The picture shows the "San Carlos" entering San Francisco Bay. This illustration is from a splendid oil-painting by the San Francisco artist Mr. Geoffrey Holt. The painting is the property of Mrs. Weldon C. Nicholls, of Berkeley. Last Christmas, Mrs. Nicholls permitted Mr. Howard J. Griffith, of the American Engraving and Color Plate Company, to reproduce this painting in colors. Our illustration was made from Mr. Griffith's reproduction. The editor of SAN FRANCISCO WATER sincerely thanks Mrs. Nicholls and Mr. Griffith for permitting this reproduction of a typically San Franciscan work of art.

It is pertinent to call attention here to the cut of Father Junipero Serra that appears in this issue of our little magazine. There is an authenticated portrait of Father Serra, but most Californians are familiar with it, so it was thought well to use here a cut of the magnificent statue of Serra made by that great San Francisco sculptor Arthur Putnam.

Although this statue stands in the Mission Dolores, it is not very well known, and the editor hopes that many San Franciscans will be sufficiently interested to make the acquaintance at first hand of this great work of art.



SAN FELIX STATION M. CAREY, PROP. SAN MATEO CO. CAL.

"Carey's is at the bottom of the lake"

On the Way to Carey's

By William F. Burke, Assistant Postmaster of San Francisco

IT was in 1912, not long after we had bought a new car and touring was still a novelty, that we ran down the main highway to San Mateo and turned westward into an inviting side road that wound along a creek and through a wooded canyon. My mother was with me, and my sister and brother and a friend, for in those days we traveled always with a full car.

As we proceeded, some strange familiarity with the hills and the road and the canyon seemed to come upon me and to grow clearer as we went along. Memories of childhood outings shaped themselves like gathering clouds until there began forming in my mind definite pictures of a place where, twice in my earliest conscious boyhood, long before my school days, we spent the summer. San Felix was the name of the place, but we used to know it more intimately as "Carey's,"

from the name of the man who owned and ran it.

Carey's—a square, gable-roofed roadside hotel, set in a beautiful valley—a summer resort, a farm, and a change station on the stage line from San Mateo to Half Moon Bay.

Before it, to the westward, rose the wooded hills. Behind it, to the eastward, the valley fell away in a gentle slope to a busy creek that sang and gurgled with a wealth of pure water even in the late summer. On this slope were berries and fruits and vegetables. To the north were fine farms and country estates that I dimly remember but cannot definitely recall. To the south was a long stretch of hay-fields and pastures in which dairy herds grazed, and drowsed, and grazed again, and where, too, a deal of construction work was going on, road work it seemed, with men and

teams plodding back and forth across the valley just at the foot of the Half Moon Bay grade.

Twice a day the stage rattled in, changed horses, and rattled out again, once on its way to Half Moon Bay and again on the return to San Mateo. It was a restful, hospitable, shut-in sort of place, beautiful in its setting among the hills.

As our car chugged leisurely along, the road, the canyon, the creek, the towering hills, the dim consciousness of that turn toward the western hills from the main road, all came tearing aside my mental cobwebs and drove me back into the years before. It needed only to replace the smooth gravel road with one of dirt and dust, to merge the hum of the motor into the rattle of trace and whiffletree, to add the voice of the stage-driver calling to his horses, and I was again—there could be no doubt of it—on my way to Carey's.

"Does it strike you," I said to my mother, "that this must be the road we used to take

to Carey's? Do you remember the stage road and this canyon and that creek? Do you remember the toll-gate, a natural gateway where two walls of rock nearly closed the canyon; where the driver, without stopping, threw the toll-money on the side of the road, and we thought how nice he was to pay toll for all his passengers? If this is the road to Carey's we ought to reach that rocky gateway somewhere along about here."

My mother said nothing (she is a non-committal little woman), but just kept her eyes busy as we rolled along through that typical landscape, one that spells California in every rounded contour of hill and gulch, in every alternating patch of shrub and grass, of rock and soil, of growth and baldness; in the alders, the wild grapes, the oak and manzanita and madrone, that alternately hid and revealed the murmuring stream, and in the dense undergrowth that quivered in the heat haze and from which rose the hum of insects and the perfumes of the summer woods.



Site of Crystal Springs Reservoir as it appeared in 1887, when work started on the huge concrete dam



From this hill the stone was quarried for the big Crystal Springs Dam. The work was in progress when Mr. Burke visited Carey's

Then we crossed the stream to the south side of the canyon, proceeded up the grade past the stately dam that holds back the Crystal Springs Reservoir, and, reaching the summit, looked out over the water shimmering before us in the afternoon sun—our first glimpse of the Spring Valley lakes.

We reveled in the wonderful beauty of the scene. The work of man had fitted so well into the plan of nature that the lake seemed there by right of ages of occupancy, despite the lichen-grown dam below us to our right and the grass-grown dam farther up the valley to our left, that between them held the lake imprisoned. All in one harmonious landscape, they seemed as if they had always been so.

We started down the grade alongside of the lake, and again those memories of the hotel at San Felix began to shape themselves.

"Carey's place must be just beyond here," I said as we turned to cross over the dam.

But on the other side the road started

abruptly up the hill on its way to Half Moon Bay. There was no hill of this kind on the way to Carey's. As a matter of fact there was no hill such as the one we had just come down from the summit to the dam we were crossing, nor was there such a hill as we climbed out of the canyon.

In bewilderment I stopped the car half-way across the dam and looked up and down the valley, picturing again the old roadside hotel, the gateway of rocks, the fields of grain, the road up the hill to Half Moon Bay, and the teams plodding back and forth at the foot of the grade. . . . A light broke upon me.

"I know where Carey's is," I said, and pointed out over the reservoir stretching to the north of us. "It is at the bottom of the lake."

There could be no mistake. Carey's, the vacation spot of my boyhood, had been in the valley that now was filled with water. The dam where we stood was where the teams had been working; the gateway of rocks where the



In this party that inspected Crystal Springs dam-site in 1887 are included Hermann Schussler, chief engineer of Spring Valley; John Perry, Jr.; George Schussler, assistant to the chief engineer; W. H. Lawrence, general superintendent; Lloyd Tevis; Thomas Brown, president of the Bank of California; Charles Mayne, director of Spring Valley; Charles Webb Howard, president; and Daniel Meyer.

toll-gate was now formed the resting-place for the shoulders of the great concrete dam we had passed on the way out of the canyon. The only things left were the road along the creek and through the canyon on the way out of San Mateo and the road winding up the hills to the westward to Half Moon Bay. All the rest was under water!

As we lingered on the dam pondering over the change in the landscape, more memories came to me. I remembered that when we went to San Felix the second time, along the road and around the hotel were strewn lengths of large-dimensioned cast-iron pipe. I had good reasons to remember these, for one day, as I sat on one of the pipes and kicked up my heels in the sheer joy of living, I lost my balance, tipped over backward, struck my head on the pipe behind me, and split my scalp open. I carry the mark to this day.

We used to have the room in the northwest

corner of the hotel on the ground floor, with one window looking out on the porch and across the road to the hills, and one looking to the north over the fields and up the valley.

I remember that I found the key of our room fitted the lock of the dairy. A little further investigation showed me that all the work in the dairy was done in the morning and the evening, leaving the place locked and alone from about two in the afternoon until five. I like sweet cream. I have always liked it and did then, and so every afternoon about three o'clock I used on various pretexts to get from my mother the key of our room door, and I would go quietly out to the dairy, let myself in, and lock the door after me. I would take the skimmer and go over all the pans within my reach carefully and thoroughly, wiping off any telltale smears or drippings. Then I would wipe the skimmer clean, let myself out again after making sure no one was passing, and return the key.

I remember watching the men and teams working on the upper dam. At that time the main concrete dam had not been started. I remember how interested I was in what they were doing, but utterly careless as to what was its purpose. As I looked back I realized that I never did know what they were doing, for the first understanding came as I paused on the dam more than thirty years after, and from the dim memory of the relation of one place to another had the truth inevitably forced upon me.

And I remembered how very far from home the place seemed; what a long ride it was on the road to San Mateo and on the train to San Francisco when vacation was over, and how, as we neared the city, we discussed whether we should get off at Twenty-fifth and Valencia or go on to Third and Townsend, both being about equally convenient, with the help of the old horse-cars on Valencia or on Third Street.

And then finally home and bed, Carey's fading away into the recesses of my memory, there to be asleep for a third of a century until, without particular purpose, I again turned westward over the road to Half Moon Bay, and came upon the place where it had been.

I have often been over that canyon road to the lakes since then. I delight to follow it to the westward, for every time I turn into it memories of those childhood days come back to me through the years now flying fast, and again I am rattling through the dust on the old Half Moon Bay stage—once more on my way to Carey's.

San Francisco in 1816

[Continued from page 10] having, moreover, arms with which to defend themselves, are rarely caught.

The commodities most acceptable to the Indians of the coast of Northwest America are guns, powder, bullets and lead for their manufacture, knives, coarse woolen blankets, and mother-of-pearl from the Pacific, which they use to make ornaments for the head and neck.

Ships are often attacked with the very arms that they themselves sold, and even on the same day that they were delivered. Most of them, however, carrying from eight to fourteen guns, are able to defend themselves.

Such occurrences are frequently turned to profit, for, should they carry off one of the chiefs, they are certain to get a great deal of merchandise as ransom, and gain greater facilities for trading.

May Heaven defend a ship from being wrecked on this coast! It is said that the barbarous habit of eating their prisoners survives among several of the tribes that inhabit it. When they build a house, or when they carry out some matter of importance, they put to death a number of slaves, as is done when a war is ended. Upon a man's death, they bury with him his wife and the slaves to whom he was most attached.

* * *

ONE of the pleasures of a vacation in the mountains is the water. There's a sweetness about good spring water that makes one understand the rhapsodies of the Psalmist and to realize that Woodworth's old oaken bucket hung in one of those prime wells in the granite that it makes you thirsty to think about.

The pleasure becomes delight if the locality happens to be one where springs are abundant. Then one becomes a connoisseur, tasting and sampling critically, as though he were judging old wines. He finds favorites, and will have none of the others, even when thirsty passing by the lesser waters to drink only at the springs superlative.

The beauty of these vintage springs, as you might call them, is that you can drink as much as you like from them without harm. Shelley used to scarify his throat with red pepper in order to increase the pleasures of claret. Fine spring water needs no such aid. When you find it on a warm day after a long walk you prefer it to the best growths of Bordeaux or Champagne, pleasant as they may be in their place.

You may, in the end, grow weary of vacation and be glad to get back to the accustomed noise and hurry. But you never grow weary of that good spring water. That is the one lingering regret when all the rest are gone.

In spite of this regret, however, one comes back to San Francisco to be pleasantly surprised. While we will not attempt to compare it to mountain spring water, our city water really is good and tastes well.—*From an editorial in the San Francisco Chronicle, September 28, 1926.*

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IT IS TRUE THAT THIS
PORT IS GOOD · NOT
ONLY FOR THE BEAU-
TIFUL HARMONY
THAT OFFERS TO THE
VIEW · BUT BECAUSE
IT DOES NOT LACK VERY GOOD FRESH
WATER · WOOD · AND BALLAST IN
ABUNDANCE · · ITS CLIMATE THOUGH
COLD · IS HEALTHFUL

—*From the Report of Don Juan Manuel de
Ayala to the Viceroy of New Spain on
the Examination of the Port of San Fran-
cisco, dated San Blas, November 9, 1775.*

January 9
SAN FRANCISCO

Water

SAN FRANCISCO
PUBLIC UTILITIES





NO ONE till the seventeenth century had guessed what might be the relations of stone and water, each equally obedient to the artist's hand. The medieval Italian fountain is a tank, a huge wash-tub fed from lions' mouths, as if by taps, and ornamented, more or less, with architectural and sculptured devices. In the Renaissance we get complicated works of art — Neptunes with tridents throne above sirens squeezing their breasts, and cupids riding on dolphins, like the beautiful fountain of Bologna . . . But these fountains do equally well when dry, equally well translated into bronze or silver; they are wonderful salt-cellar or fruit-dishes; everything is delightful except the water, which spurts in meagre threads as from a garden-hose. They are the fitting ornament of Florence, where there is pure drinking water only on Sundays and holidays, of Bologna, where there is never any at all. ∞ The seventeenth century made a very different thing of its fountains — something as cool, as watery, as the jets which gurgle and splash in Moorish gardens and halls, and full of form and fancy withal, the water never alone, but accompanied by its watery suggestion of power and will and whim. They are so absolutely right, these Roman fountains. . . .

VERNON LEE
In Old Italian Gardens

SAN FRANCISCO WATER

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SPRING VALLEY WATER COMPANY

SAN FRANCISCO, CALIFORNIA

VOLUME VI

JANUARY, 1927

NUMBER 1

“*The Approach of Perpetual Waters*”

By the Editor

THE Romans,” wrote Alice Meynell, “knew how to cause the parted floods to measure their plain with the strong, steady, and level flight of arches from the watersheds in the hills to the arid city; and having the waters captive, they knew how to compel them to take part, by fountains, in this Roman triumph. They had the wit to boast thus of their brilliant prisoner. . . . You could not look to the city from the mountains or to the distance from the city without seeing the approach of those perpetual waters.”

Upon the traveler whose imagination plays against a background of Roman history the aqueducts of the Eternal City exercise a never-ending fascination. Those old Romans made both war and peace in the grand manner. Their legions and their ships of fortune moved with a conquering cadence. Their architects and engineers thought and wrought in the scale of immortality. On the bloody sands of the Flavian Amphitheater the gladiators saluted Cæsar with “Morituri, salutamus,” but the Coliseum itself has always seemed to say, “Ave, Roma Immortalis.” And the aqueducts, marching across the Campagna “to take part, by fountains, in this Roman triumph,” utter the same proud phrase.

In Rome, as in the empires that preceded Rome, tremendous expenditures of brain, time, and labor were made to solve the primary problem of water supply. But Rome, far more than the precedent empires upon whose ruins she rose, gave to water all that she could command of art in order that hy-

draulic engineering might be beautified and water ennobled.

Roman architecture has been endlessly acclaimed, but Roman engineering has not always received its due. “In comparing Greek and Roman aqueducts,” writes Thomas Ashby, director of the British School of Archeology at Rome, “many writers have enlarged on the greatness of the latter as an example of Roman contempt for natural obstacles, or even of Roman ignorance of the laws of nature. Now, in the first place, the Romans were not unacquainted with the law that water finds its own level (see Pliny, *Hist. Nat.* xxxi. 57, ‘subit altitudinem exortus sui’), and took full advantage of it in the construction of lofty fountains and the supplying of the upper floors of houses. That they built aqueducts across valleys in preference to carrying pipes underground was due simply to economy. Pipes had to be made of lead which was weak, or of bronze which was expensive; and the Romans were not sufficiently expert in the casting of large pipes which would stand a very great pressure to employ them for the whole course of a great aqueduct. Secondly, the water was so extremely hard that it was important that the channels should be readily accessible for repair as well as for the detection of leakage. Moreover, the Roman aqueducts did not, in fact, preserve a straight line regardless of the configuration of the country. A striking example is the aqueduct of Nemausus (Nîmes), the springs of which are some ten miles from the town, [Continued on page 14]



Aqua Claudia, one of the most famous of ancient Rome's eleven aqueducts, was begun by the Emperor Caligula in A. D. 38, and completed by the Emperor Claudius in A. D. 52. Its farthest spring, the Fons Albulinus, was about forty-five miles from Rome. It crossed ravines and tunneled hills until within seven miles of the city, entering upon a magnificent line of arches.



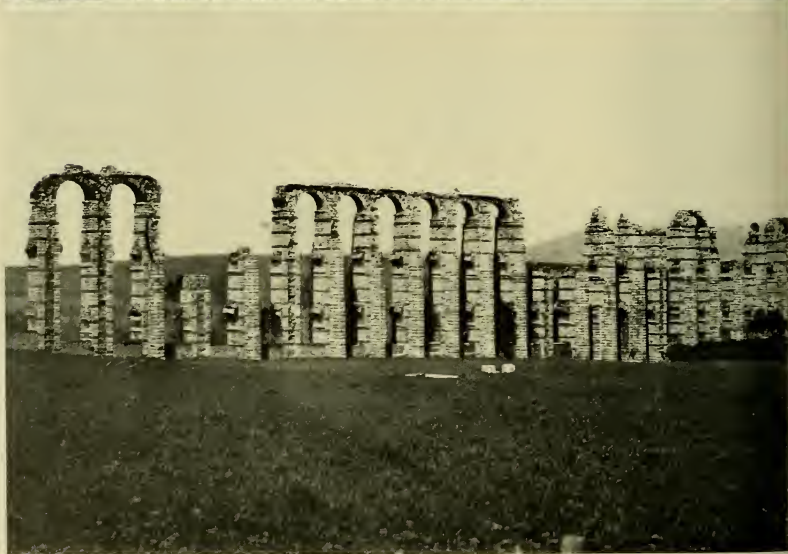
The ruins of Aqua Claudia form one of the most conspicuous features of the Campagna. Though only finished in A. D. 52, restorations and repairs were found necessary under Emperor Vespasian in A. D. 70 and Emperor Titus in A. D. 80. This surprising need is laid either to hasty or to dishonest construction—the inscriptions recording the fact are discreet.



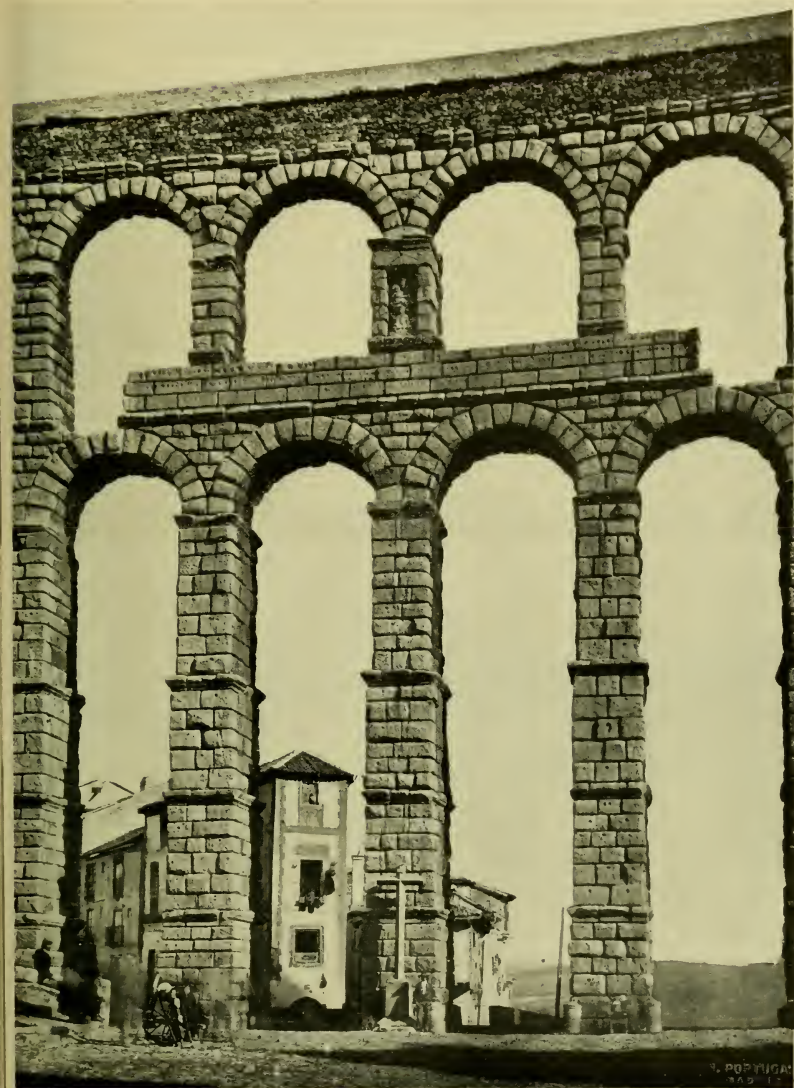
Aqua Claudia within the Eternal City. Above the archway in the lower left-hand picture Claudia anciently found one of its city distributing reservoirs. An inscription on the lower arch to the right records the repair of Aqua Claudia during the pontificate of Pope Sixtus V, in the year 1585. The arch was built as part of this extensive rehabilitation.



The influence of Roman architecture and engineering persisted for centuries in Spain, and was revived in medieval times. Plasencia (above) was the site of a Roman settlement, but this aqueduct was built in the Middle Ages. Teruel (below) is a city of Aragon that boasts an admirably constructed two-storied aqueduct. Started in 1537, it was completed in 1558.



Tarragona (above), with a history going back to Julius Cæsar and beyond, has an aqueduct dating from imperial times. The length is twenty-two miles, part underground. It was restored to use between 1780 and 1800. Merida (below) dates back to 23 B. C. and was once known as "the Spanish Rome." Its ruined aqueduct shows three tiers in brick and granite.



One of the noblest Roman works extant in Spain is the aqueduct of Segovia. It dates from Augustus, and was restored under the Flavians or Trajan. It was partly destroyed when the Moors besieged Segovia in the eleventh century, but was rebuilt by Isabella the Catholic and dedicated to the Blessed Virgin and St. Sebastian, whose shrines remain.



This section of the Roman aqueduct of Segovia, called El Puente, traverses a deep valley, the suburbs, and part of the city. For part of the distance it has two stages. It is built entirely of blocks of granite, without either mortar or clamps. The main storage reservoir for Segovia's supply of mountain water is outside the city, beyond El Puente.



Madrid derives its water supply from the Valley of the Lozoya. There, at an elevation of 8,040 feet above the sea, a granite-walled stream is diverted and carried forty-three miles to the capital. Above, a reservoir on this great system. It is shown incomplete; after roofing, it was covered with earth. Below, the Old Reservoir in Madrid, where art does honor to water.



Lozoya water on its way to Madrid, a city about the same size as San Francisco. The Madrid Water Conduit—so the works are called—dates from the late fifties of the last century, like our water supply. This photograph was taken during construction, and records a time when hydraulic engineers wore frock coats and canes.

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EDWARD F. O'DAY, Editor

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NO. 1

"Traverse the desert, and then ye can tell
What treasures exist in the deep cold well;
Sink in despair on the red, parched earth,
And then ye may reckon what water is worth."

THE simple fact not to be forgotten about water is that, no matter under what difficulties, it is always brought to those that need it. Great cities—and San Francisco is one of them—may have been placed by their founders in situations not friendly to easy water supply. But there was a sound reason for the sites upon which they were built, and that being so, no effort to supply them with water was deemed too great a tax upon the energies of their people.

Rome became Rome under Romulus and Remus (if we accept the story of its traditional origin, and traditions have an uncanny faculty of proving to be true), because the Tiber was the largest and most navigable river in the Italian peninsula. Water for the great city that Rome rapidly became had to be sought at a distance. Hence the tremendous system of Roman aqueducts, the first of them built in the year 312 B. C. San Francisco, one of the precocious children of very recent history, was built upon a harbor, without reference to water supply. The harbor justified those that laid the foundation of the city—water came to San Francisco because, despite the difficulties of transmission, San Francisco had to have water.

No apology is necessary for presenting the readers of SAN FRANCISCO WATER with the beautiful series of aqueduct pictures set forth in this issue. One does not have to be architect or engineer to appreciate them. They tell their own story, and it is a story of grandeur, of nobility, of beauty made handmaiden to the most urgent demand of practical life. These pictures, aside from their own interest, should excite our admira-

tion for the labors of present-day hydraulic engineers. Aqua Claudia is sublime—but what of the first Pilarcitos pipe-line brought from miles away to San Francisco by Hermann Schussler? . . . Perhaps we are too self-conscious to celebrate our own engineers in the way that Livy, Pliny, and Strabo celebrated those great Romans who brought water to their beloved city. But, nevertheless, these engineers of ours are doing work comparable with that which made certain ancient Romans, like Agrippa, immortal.

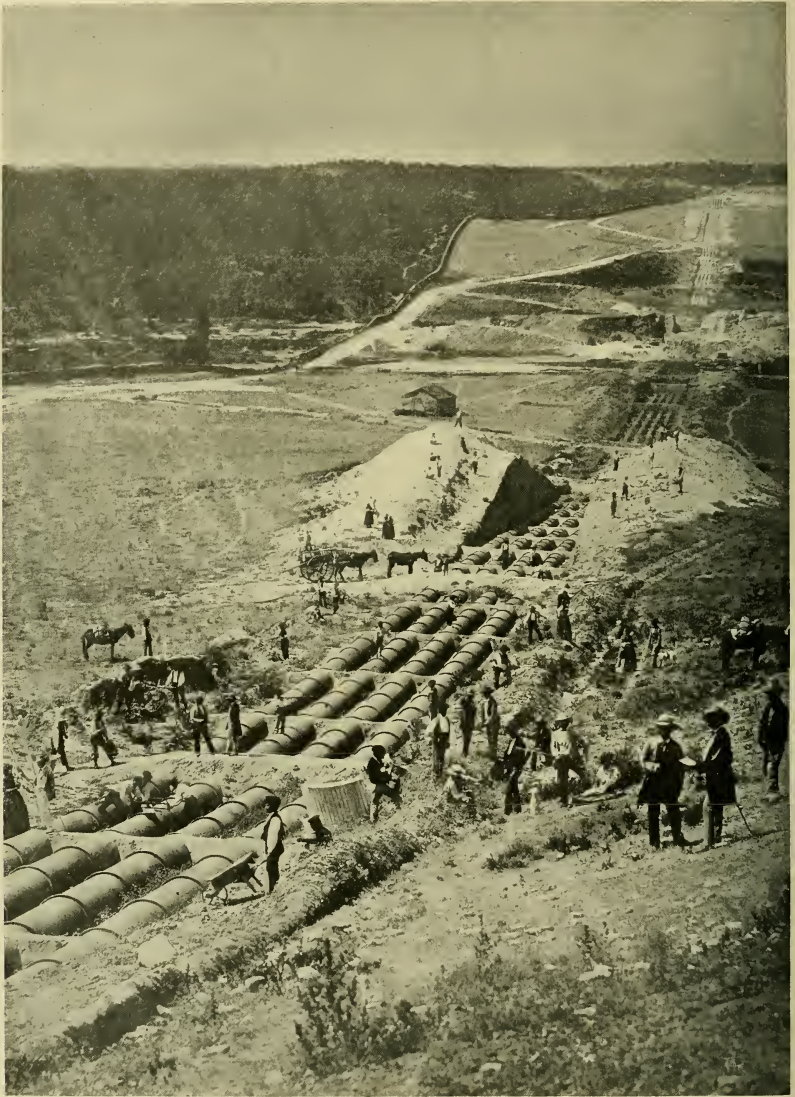
Spring Valley Water Company owes the series of pictures embodied in this issue to the thoughtfulness of Mr. Gardner Dailey, who during a tour of Europe that embraced the most intimate of interests found time to gather photographs of aqueducts rarely seen in books, and to supplement this collection by others from his own camera. To Mr. Dailey's willingness to sacrifice days of his precious time in Europe, we owe pictures of Aqua Claudia that are quite unlike those usually reproduced. He found time to follow Aqua Claudia from Rome into the Campagna, and his sense of artistic composition told him what pictures to take.

"There are such things as fountains in the world, small as well as great," said Coleridge, and Mr. Dailey appreciated that when he photographed the fountain pictured on the cover. It is not such a fountain as Vernon Lee accentuated, but it is Rome in essence, and Coleridge, who loved fountains small as well as great, might conceivably have preferred it to any of the great Bernini fountains.

To Mr. Dailey's camera we owe also the pictures of the Moorish aqueduct near Algeciras. Even the most indefatigable tourist gives this aqueduct little attention, and few are they that think of photographing it. Hence, it will be studied as something new by very many of our readers. It is in striking contrast to the Roman aqueducts pictured herein, and may help students to understand how the Saracens, with their background of mathematics, brought something very important into the European practicalities of architecture and engineering.

* * *

ALL Spring Valley Water Company joins with the editor in wishing readers of SAN FRANCISCO WATER a Happy New Year.



Another picture of the mid-nineteenth-century period when the Madrid Water Conduit was under construction. This is the Siphon of Bodonal, an iron pipe installation. At the time it was being built Hermann Schussler, of Spring Valley Water Company, was studying the applicability of riveted steel pipe to the economic uses of a modern water supply.



Across the Bay from Gibraltar basks the pleasant little Spanish town of Algeciras, which waited until the early twentieth century to attain political significance. Yet it was founded by the Moors in 713. This is the Moorish aqueduct of nearby Los Barrios. Note how lightly they built, with reliance on flying buttresses.

[Continued from page 1] though the actual distance traversed is about twenty-five. Other devices, such as changing the level and then modifying the slope, and siphon arrangements of various kinds, were adopted (as in the aqueduct at Aspendus)."

Though only one of Rome's ancient aqueducts, Aqua Claudia, is pictured here, there were eleven in use during the height of imperial greatness. These were:

1. Aqua Appia, 11 miles long, all but 300 feet below ground. It was constructed in 312 B. C. by the censor Appius Claudius Caecus. Apparently it was Rome's first aqueduct.

2. Anio Vetus, 43 miles long, 1100 feet of its length above ground. Two miles from Rome it parted into two courses for the better supply of different sections of the city. It was built 272-269 B. C. by the censor Manius Curius Dentatus.

3. Aqua Marcia, 61 miles long, of which 54 miles were underground, the rest carried partly on substructions, partly on arches. It was the work of the praetor Quintus Marcius Rex, 144 to 140 B. C. Its waters were celebrated for their coolness and excellent quality. Augustus increased its volume, and it was repaired and restored by later emperors. In 1869-70 it was reconstructed by Pope Pius IX.

4. Aqua Tepula, 11 miles long. Its underground course is untraceable, but for the last six miles it ran on the same arches that carried Aqua Marcia, though at a higher level. It was the work of the censors Cn. Servilius Caepio and L. Cassius Longinus, and was completed 125 B.C.

5. Aqua Julia, 15 miles long, joined Aqua Tepula. The combined stream entered a reservoir outside the walls, then divided again into two channels. It was built in 33 B. C. by M. Vipsanius Agrippa, who also began in the same year—

6. Aqua Virgo, 14 miles long, conveyed in a channel partly underground and partly above ground. Its water was celebrated for excellence. Pope Pius V restored it to use in 1570.

7. Aqua Alsietina, or Augusta, 22 miles long, a small part on arches. No remains of it exist, and its course is untraceable. Augustus built it to furnish water for his "naumachia," a basin for sham sea-fights.

8. Aqua Claudia, 45 miles long, the last

7 miles on arches. It was built by Caligula and Claudius.

9. Anio Novus, 62 miles long, was built by the same emperors. It united with Aqua Claudia seven miles out of Rome.

10. Aqua Traiana, 36 miles long, was constructed by Trajan in A.D. 109. It was restored by Pope Paul V in 1611.

11. Aqua Alexandrina, 14 miles long, was built by Emperor Alexander Severus in A.D. 226. Its springs now supply the modern Acqua Felice, constructed by Pope Sixtus V in 1585. A memorial arch erected on that occasion is pictured on another page.

The water-carrying channels of these aqueducts varied a great deal in size at different points of the line. Anio Novus is the largest, being from three to four feet wide and nine feet high to the top of its pointed roof. They are lined with hard cement containing fragments of brick. Concerning their capacity, Mr. George E. Tonney, of the engineering department of Spring Valley Water Company, wrote as follows in *SAN FRANCISCO WATER* for October, 1925:

"The discharge capacity of the total of these aqueducts is extremely problematical. Estimates and calculations made by different engineers vary from sixty million to four hundred million gallons per twenty-four hours. Herschell, an American engineer, makes the estimate of eighty-four million gallons—fifty-four used within the city and thirty without. He calculated that the Claudia and the Novus each could carry 16,800,000 gallons. The daily consumption in the city he put at twenty million gallons, or thirty-eight gallons per inhabitant."

"All the aqueducts," writes Ashby, "ended in the city in huge castella, or reservoirs, for the purpose of distribution. Vitruvius recommends the division of these into three parts—one for the supply of fountains, etc., one for the public baths, and one for private consumers. . . . Besides these main castella there were also many minor castella in various parts of the city for sub-distribution. To allow the water to purify itself before being distributed in the city, filtering and settling tanks (*piscinae limariae*) were built outside the walls. These *piscinae* were covered in with a vaulted roof, and were sometimes on a very large scale, as in the example still preserved at Fermo, which consists of two stories, each having three oblong basins

communicating with each other; or the *Piscina Mirabilis* at Baiae, which is covered in by a vaulted roof, supported on forty-eight pillars, and perforated to permit the escape of foul air. Two stairs lead by forty steps to the bottom of the reservoir. In the middle of the basin is a sinking to collect the deposit of the water. The walls and pillars are coated with a stucco so hard as to resist a tool."

Concerning the materials used in the Roman aqueducts, and certain engineering features, William Matthews is our authority. He writes:

"The materials employed were different even in the same aqueduct; and in constructing an arch of the *Aqua Marcia* there were used three kinds of stone, one reddish, another brown, and a third of an earthy color. The *Aqua Claudia* was constructed with a beautiful hewn stone, whilst others were built with bricks and a strong cement, which so firmly united them as to render the work almost a solid mass. Moreover, the *Aqua Appia* differed from the others, by its having a peculiar construction of width, as it approached the point where the water was disembogued.

"Although several of the Roman aqueducts might have been constructed in a straight line, yet it is remarkable that their contrivers adopted a sinuous course with numerous windings. Various plausible reasons have been suggested for their preference of such a devious track; some presuming its chief object was to avoid the expense of erecting arcades of great height and solidity; whilst others have inferred that it solely had in view the preserving of a gentle and equable current for the water. The latter reason appears to be both plausible and cogent; for if the velocity had been considerable, the strong and impetuous motion of the water would have continually kept it in a turbid state, and consequently rendered it unsuitable for the beverage and other uses of the inhabitants. However, another important circumstance demanded peculiar attention and consideration; this was the prevention of injury to the aqueducts, from the constant attrition produced by the force and motion of a very quick current upon the bottoms and sides of their channels, for the repairing of such dilapidations would inevitably be attended with great inconvenience."

The Roman aqueducts did not have to wait until modern times to command admiration. Men who saw them building were deeply impressed. Thus Pliny writes:

"If any person shall very attentively consider the abundance of water conveyed to the public, for baths, fish-ponds, private houses, fountains, gardens, villas—conducted over arches of considerable extent—through mountains perforated for the purpose, and even valleys filled up, he will be disposed to acknowledge that nothing was ever more wonderful in the world."

For Agrippa, who built *Aqua Julia* and *Aqua Virgo*, Pliny has a special admiration, stating that "in the course of one year he actually formed 70 pools, 105 fountains and 130 reservoirs, besides adorning all these works with several hundreds of marble statues and columns."

Modern scientists have been equally enthusiastic. Thus, Professor Leslie writes in his *Elements of Natural Philosophy*: "These works were executed in the boldest manner; nothing could resist the skill and enterprise of the Romans; they drained whole lakes, drove mines through mountains, and raised up the level of valleys by accumulated arcades. The water was kept cool by covering it with vaults, which were often so spacious that, according to Procopius, who wrote in the time of Belisarius, a man on horseback could ride through them. So abundant indeed was the supply as to induce Strabo to say that whole rivers flowed through the streets of Rome."

The most important Roman aqueducts in Spain are pictured in this issue of *SAN FRANCISCO WATER*—those of Segovia, Tarragona, and Merida.

From its mountain sources the water destined for Segovia is carried part of the way in an uncovered conduit, then underground to a reservoir on a height above the city. Beyond this is the aqueduct proper, 2,400 feet long, with 109 arches of fine masonry in two tiers, reaching the height of 102 feet. Of this Segovian aqueduct William Matthews wrote:

"This fine structure is remarkable for its solidity and excellent masonry. Fortunately this admirable relic of antiquity has equally withstood the desolating violence of barbarians, and the powerful attacks of inclement seasons, through a long series of ages. The

design is strikingly light and beautiful; and its aspect has not only afforded gratification to architects, but puzzled antiquarians, who have entertained different opinions with regard to the epoch of its construction—some ascribing the merit of erecting it to Trajan, and others to Hercules, for it has no inscription to determine the period when it was built."

Of very special interest to San Franciscans are the pictures of the water supply of Madrid. Madrid, a city of about the same population as San Francisco, is like San Francisco in the fact that its water must come from a distance. The capital of Spain is situated on a steppe at an elevation of 2130 feet above the sea. There is no important river in the vicinity.

At about the same time that Spring Valley Water Company began to develop a water supply for San Francisco in San Mateo County, Madrid went forty-three miles away to the Valley of the Lozoya to divert the waters of a stream of the same name.

"The valley," it has been said, "with its somber granite hills, its thick and gloomy forests of coniferous trees, and its red-tiled villages, seems to belong rather to the north than to the south of Europe." The diversion is made at an elevation of 8040 feet above the sea, by means of a canal, the siphon of Bodonal, and by aqueduct. One of the reservoirs on the line is pictured here as it appeared during construction.

The water is carried to the highest section of Madrid, to the Depositos del Canal de Lozoya, where there are two reservoirs. The Old Reservoir was constructed in 1858, and is embellished with a fountain (pictured on

another page) where the story of the water is told by means of allegorical figures. The New Reservoir, completed in 1883, is in the form of a huge vault, 225 yards long and 150 yards wide, supported by 1040 granite pillars. It contains about forty million gallons of water. There is also a water tower, 122 feet high, for the supply of the higher quarters of the city.

Any water supply of today, entering the city from a distance, usually approaches in an unpretentious manner. It is so, for the most part, with Spring Valley Water Company, the notable exception being that part of the Alameda installation which threads the hillside curves of Niles Canyon. There is a very real dignity in that particular Spring Valley line. The huge aqueduct of reinforced concrete has a capacity of seventy million gallons, and at one place where it spans a ravine there is an archway of great beauty, art going hand in hand with engineering.

Here one does not have to imagine—one actually sees—what Mrs. Meynell meant when she wrote of "the approach of perpetual waters." And here too the phrase "living waters" takes on a new meaning. In the Spring Valley system this Sunol Aqueduct is one of the most picturesque features, worthy to be mentioned in the same category as the Water Temple at Sunol, the masterpiece of the late Willis Polk, than which there is not in all North America a more lovely architectural tribute to the nobility of "living waters."

Some day, perhaps, a poet will pay tribute to this loveliness as old John Dyer did to the aqueducts of Rome:

*"The radiant aqueducts
Turn their innumerable arches o'er
The spacious desert, brightening in the sun,
Proud and more proud in the august approach:
High o'er irriguous vales, and woods, and towns,
Glide the soft whispering waters in the wind,
And here united pour their silver streams,
Among the figured rocks, in murmuring falls,
Musical ever."*

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LAUDIUS BROUGHT
TO THE CITY THE
COOL AND PLENTIFUL
SPRINGS OF THE
CLAUDIAN WATER ,
ONE OF WHICH IS
CALLED CAERULEUS , AND THE
OTHER CURTIUS AND ALBUDINUS ,
AS LIKEWISE THE RIVER OF THE NEW
ANIO , IN A STONE CANAL , AND
DISTRIBUTED THEM INTO MANY
MAGNIFICENT RESERVOIRS ,

SUETONIUS

SAN FRANCISCO Water

April
1927





ASPAR DE PORTOLA was born in 1723 at Balaguer in Catalonia, Spain, and was of noble rank. ✠ He was commissioned an ensign in 1734, a lieutenant of dragoons and grenadiers in 1743, and a captain in the España regiment of dragoons in 1764. ✠ According to the regimental records he "was present at the sieges of Demonte, Cuneo, Tortona, Valencia on the Po; the battles of Madona on the Olma, in which he was wounded, and of Placencia; the skirmishes at the passage of the Panaro and of the Fidoni; and took part in the campaign of Portugal." ✠ Portola was Governor of the Californias from 1767. In 1776 he was appointed Governor of the city of Puebla. His successor was appointed by a royal order of 1783; and in 1784 the Viceroy reported to the Minister of War in Spain that he had advanced to Colonel Portola twelve payments of his salary to cover the expenses of his return to Spain. The date of his death is yet to be ascertained.

*

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VOLUME VI

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NUMBER 2

The Portola Expedition in San Mateo County

By the Editor

THE history of San Mateo County and of the Spring Valley watersheds therein started in 1769, while George III ruled Great Britain and the American Colonies, Louis XV was king of France, and Charles III king of Spain. In the matter of recorded history, therefore, our neighbor county on the peninsula of San Francisco may boast a respectable antiquity.

San Francisco history began in the same year, and, paradoxical as it may seem, one of the great events in San Francisco history did not happen on San Francisco soil. It was from a hill in San Mateo County, a hill on the watershed of Spring Valley Water Company, that members of the Portola expedition obtained their first glimpse of the future city of San Francisco.

It is not necessary to give here, even in outline, the general story of the Portola expedition. That great quest for the port of Monterey is now familiar to every Californian. But it is interesting to focus attention upon the incidents of the expedition that occurred in San Mateo County. These incidents were most important in their bearing upon subsequent events—it has been said that they “reawakened Spain.”

The name of Don Gaspar is commemorated in Portola Valley, which was recently described by a great landscape engineer as “one of the three loveliest little valleys in the United States,” and in Portola Woods, a residence subdivision developed by Spring Valley Water Company. And in other regions of San Mateo County the footsteps of the expedition are clearly marked.

The fact that Don Gaspar and his band

can be so closely followed in their exploration of San Mateo County is due to the care with which the accounts of the expedition have been studied and edited. There are several of these, including that of Costanso the engineer, and Crespi the Franciscan padre. This latter has just been made available in English through the generosity of Mr. Sidney M. Ehrman, of San Francisco, who financed the translation, editing, and publication of Palou's *Noticias*. This great source-book of Californian history had never been translated before. The work was done by Professor Herbert E. Bolton, of the University of California. The entire Crespi diary was incorporated by Palou in the *Noticias*, and Professor Bolton's notes enable us to move step by step through San Mateo County with Don Gaspar de Portola.

I

The famous Portola expedition set out from the port of San Diego on July 14, 1769. It was composed of the Governor and Commander-in-Chief Don Gaspar de Portola, with one servant and twenty-seven leather-jacket soldiers; the lieutenant Don Pedro Fages, with seven of his volunteer soldiers of the Free Company of Catalonia; the engineer Don Miguel Constanzo; seven muleteers, and fifteen Christian Indians from Lower California. Junipero Serra sent along two Franciscan missionaries, Father Juan Crespi and Father Francisco Gomez. Serra charged Father Crespi to keep a diary of the journey, “which he did faithfully,” says the historian Palou. It is because of the fidelity and accuracy with which Father

Crespi kept his diary that we are able to trace so closely the route of Portola.

On October 24, 1769, Father Crespi records that "in two leagues we crossed two valleys with very good land and an abundance of running water." One of these valleys had a "fair-sized lagoon." Professor Bolton identifies this as the lake at Arroyo de los Frijoles, halfway between Bolsas Point and Pescadero Point. "This is a fine place," said Crespi, "with good lands and an abundance of water, where a good mission could be placed." But no mission was ever placed there.

The expedition camped that night at San Gregorio Creek, near the coast. Father Crespi was very much impressed with this place. He described it: "It is a small valley with a good village of heathen, who received us with much friendliness. They are fair, well formed, and some of them are bearded. They have their village near the beach, about half a league from the camping-place; but they also have their little houses in this valley, and at present are living in them. The valley has a great deal of land, much of it good; in the middle of it there is an arroyo with plenty of running water which goes to the beach, on whose edge, lower down, these heathen have their village. The only shortcoming that I noticed was the scarcity of wood, but the mountains are near, and there is plenty of brush from the redwoods."

The Indians of San Gregorio appear to have had town houses and country villas! Aside from that, the interesting point here is the mention of redwoods. It was only a short time before that the expedition had made its first acquaintance with these noble trees. It is worth while to go back and pick up the passage.

On October 10, 1769, while advancing from the Pajaro River near Watsonville to Soquel Creek, the expedition came upon "some very high trees of a red color, not known to us. They have a very different leaf from cedars, and although the wood resembles cedar somewhat in color, it is very different and has not the same odor; moreover the wood of the trees that we have found is very brittle. In this region there is a great abundance of these trees and because none of the expedition recognizes them, they are named redwood from their color."

On October 25, the expedition halted to

rest the pack animals, and scouts were sent out, doubtless under command of that really great scout, Ortega, to reconnoiter. Provisions were running short. The meat for the soldiers was all gone, and they were reduced to five tortillas a day, one for breakfast, two for dinner, and two for supper. "A very small ration for so much work," writes Father Crespi; "but there is nothing else to give them, and the poor fellows content themselves."

Next morning, October 26, Captain Don Fernando de Rivera arose ill with the prevalent scurvy, and with diarrhea as well. But next day, October 27, the captain and the rest of the sick were better, so the march was resumed "north over high hills, all burned." After three hours travel they halted near the beach at Purisima Creek. There were some deserted dwellings here; the Indians had moved to the mountains. Why? The soldiers soon found out. Says Crespi: "All the inquisitive persons who wished to see the habitations which had been abandoned by the heathen, some few grass huts, were covered with fleas, for which reason the soldiers named it Village of Las Pulgas."

On October 28, 1769, the expedition advanced near the beach over "low mesas of good land, although all the grass had been burned." Traveling about two leagues in two hours and a half, they came to a large arroyo near the beach, which carried a good volume of running water. This may have been Frenchman Creek, but was more probably, thinks Professor Bolton, Pilarcitos Creek. Father Crespi gives us this description:

"During the entire march the country has been bare of trees, and only behind a mountain range where we saw a higher one are there to be seen some groves, which they say are pines. From the camp a very long point of land which runs out into the sea is visible; at the end of it there is a great deal of low land, with many large rocks, which at the distance appear to be farallones, and which stretch to the west. The four heathen from the village of our father Saint Dominic (at San Gregorio Creek), who are following us and serving as guides, tell us that near that point there is a good village of heathen. These four wished us to camp there, and I wished it as much as they did, in order to see the place, and the poor unfortunates who live



Pulgas Tunnel, through which Spring Valley water from across the Bay pours into Crystal Springs, takes its name from a dismaying incident of the Portola Expedition

in it; but we could not do so as it was late and the men were very tired. I named this arroyo The Holy Apostles St. Simon and St. Judas. In this place there are many geese, and for this reason the soldiers named it the plain of Los Ansaes."

The point of land is Pillar Point at the head of Half Moon Bay.

It is interesting to note that the pious padre christened places with pious names, while the soldiers frequently gave the same places homelier names of their own liking. In a good many cases the soldier-name survived. Pajaro, for instance, is a soldier-name, and so is Pulgas. Both the pious name of the arroyo just mentioned and its soldier-name of The Geese have disappeared.

II

There was abundant cause for uneasiness while the Portola expedition camped on Pilarcitos Creek within view of Pillar Point. They did not know where they were, food was short, and sickness was prevalent. Writes Father Crespi:

"From the camp the above-named point (Pillar Point) lies to the north-northwest, and the high rocks look like two thick faral-

lones of an irregular and pointed shape. On seeing these indications we did not know what to think. We believed that we were now in latitude thirty-seven degrees and a half, without being able to say whether we were distant from or near the port of Monterey. Every little while it rained on us, and the men were downcast and reduced to only five tortillas a day, made of flour mixed with bran. No grain remained, and only a little meat, which was reserved for the sick. They talked of killing mules for the healthy ones to eat, but the soldiers refused to accept this relief until the last extremity.

"The Commander (Portola), as a consolation for their misfortune, fell ill; the Captain (Rivera) continued to suffer from his sickness; and many were afflicted with a diarrhea which prostrated them. However, it appears that this trouble was remedial, for with it they felt relieved of the greater ill from which many were suffering, the scurvy, which had made even greater ravages on those who had come on the ships, and they were relieved without any other medicine than the new disorder of the diarrhea. They were undoubtedly improving, for by this means nature was discharging the humors

which had caused the epidemics. The change of weather contributed to it, also the cessation of the northwest winds, the benefit of the rains, and the beginning of land breezes, which no doubt purified the air that was so noxious to us, for they immediately perceived that the swelling in their legs went down. The acute pains which they had previously felt in all their limbs, and which had kept them constantly groaning, ceased, and the swelling of the gums diminished, so that they took some consolation and hope of soon recovering entirely."

By Monday, October 30, the sick felt better, and the expedition moved on. They marched northwest along the beach. Father Crespi noted "a good little bay, with pasture, good water and land, which would be suitable for a town if there were any firewood; but it lacks this advantage, for not even a twig could be found. We stopped," he writes, "not far from the shore at the foot of some hills which prevent us from passing along the beach. They form a valley sheltered from the north, from which flows an arroyo with plenty of good water. The camp was pitched on its bank, after a march of two leagues, which we made in three hours and a half." This day's camp was on San Vicente Creek.

And now the leaders of the expedition began to realize where they were; it was at last brought home to them that they had passed Monterey Bay, the objective of the long, weary, hazardous march from San Diego.

On October 31, they left San Vicente Creek and ascended the high hills which prevented passage by the beach.

III

What follows in Crespi's diary is the narrative of one of the great incidents in California history, for the leaders of the expedition, gazing from the Montara Mountains, beheld what was known then as the Bay of San Francisco, not our San Francisco Bay, but what came to be called afterwards the Gulf of the Farallones, extending from San Pedro Point in San Mateo County to Drake's Bay and Point Reyes in Marin County. Here is Crespi's account:

"As soon as we ascended to the summit we descried a great bay formed by a point of land which runs far out into the open sea

and looks like an island. [This is San Pedro Point. Crespi called it Angel Custodio, or Guardian Angel, but the soldiers found in the neighborhood mussels which were large, succulent, and plentiful, so they called it Punta de las Almejas.] Farther out, west-northwest from where we stood and a little to the southwest of the point, six or seven white farallones of different sizes were to be seen. Following the coast of the bay to the north some white cliffs are visible, and to the northwest is the mouth of an estuary which seems to penetrate into the land.

"In view of these signs, and of what is stated in the itinerary of the pilot Cabrera Bueno, we came to the recognition of this port; it is that of Our Father San Francisco, and we have left that of Monterey behind."

Joseph Gonzales Cabrera Bueno was the author of a work on navigation entitled *Navegacion Especulativa y Practica*, published in Manila, 1734. This work, according to the historian of Spanish California, Charles E. Chapman, gives a fairly accurate description of the California Coast. It is more than likely that Father Crespi carried a copy. He goes on:

"Filled with these doubts and arguments, we descended from the hill and pitched camp in the middle of a small valley, some six hundred varas long and about a hundred wide, which has plenty of water in two small arroyos which unite to enter the sea. The valley has a great deal of reed-grass and many blackberries and roses; there are a few trees in the beds of the arroyos, and some moderate-sized willows, but on the hills there was not a single tree to be seen except some on a mountain range which encircles this bay.

"Not far from the camp we found a village of very friendly heathen, who, as soon as we arrived, came to visit us with their present of tamales made of black seeds. Judging by the fires that we have seen on the beach, it must be well populated with villages.

"From this beach the farallones lie west by southwest, and the point which I believe to be Point Reyes, and is the one that forms and encloses the bay at the northern end, lies west by northwest. All the signs that we find here we read in the itinerary of the pilot Cabrera Bueno, from which we conclude that this is the port of San Francisco,



Professor Bolton opines that Portola camped one night on Pilarcitos Creek. Here is a Pilarcitos nook of loveliness on Spring Valley watershed

and we are confirmed in this by the latitude in which we find ourselves, which is a full thirty-seven and a half degrees; for although that author places it in thirty-eight and a half, that does not disturb me, considering that we have observed that this happens in all his reckonings whenever he describes this coast and its latitude. For example, he puts the harbor of San Diego in thirty-four degrees, while in the observation repeatedly made there it came out a little more than thirty-two degrees and a half. Point Concepcion we found in thirty-four and one-half degrees, while he puts it in thirty-five and a half. And so it would not be surprising if this harbor, which is in full thirty-seven and a half degrees, should turn out to be that of our father San Francisco, since we find all the other signs that the author gives for the port referred to."

Whether Crespi calls it the port, the harbor or the bay of San Francisco, it must be held in mind that he is speaking of the Gulf of the Farallones.

"Some of our party," he continues, "do not yet believe that we have left the port of Monterey behind or that we are on that of

my father San Francisco. In order to clear it up entirely the Commander ordered that during the day Sergeant Ortega should go out with a party of soldiers to explore, and that we should wait until their return."

The camp where this momentous decision was made, we know from Professor Bolton, was on San Pedro Creek, near San Pedro Station.

IV

There on November 1, 1769, Father Crespi and Father Gomez said Mass, and Ortega started out, to be gone not more than three days. Next day some of the soldiers asked permission to hunt, for they had seen many deer.

"Some of them went quite a distance from the camp and climbed the hills, so that it was already night when they returned. They said that toward the north they had seen an immense arm of the sea, or an estuary, which penetrated into the land as far as the eye could reach, extending to the southeast; that they had seen some beautiful plains well adorned with trees, and that the smokes which they saw in all directions left no doubt

that the country was thickly populated with heathen villages.

"This report confirmed us still more in the opinion that we were on the port of Our Father San Francisco, and that the arm of the sea which they told us about was certainly the estuary of which the pilot Cabrera Bueno spoke, the mouth of which we had not seen because we went down to the harbor through a ravine. That pilot, speaking of it, uses these words: 'Through the opening in the center enters an estuary of salt water without any breaking of the waves at all, and by going in one will find friendly Indians and can easily take on water and wood.'

"We conjectured also from these reports that the explorers [Ortega's scouts] could not have crossed to the opposite shore which was seen to the north, and consequently, would not succeed in exploring the point which we judge to be that of Los Reyes, for it would be impossible in the three days that they were to be gone to make the detour that they would unavoidably have to make to round the estuary, whose extent the hunters represented as being very great."

Those Spanish leather-jackets, the first white men to hunt deer in San Mateo County, share with Sergeant Ortega the renown of discovering our San Francisco Bay, Crespi's estuary. But they had no conception of the importance of what they had seen.

At night of November 3 the Ortega scouting party came back, "firing loud salutes, thus letting us know in advance that they were bringing some good news." What was this good news?

"They told us what they had learned or inferred from the uncertain signs made by the heathen; that is, that two days' march from the place which they had reached, which was the end or head of the estuary, there was a harbor and a ship in it. As a result of this many now believed that we were at Monterey, and that the packet *San Jose* or the *San Carlos* was awaiting us. And certainly our necessities made us wish, even if we did not believe, that we were in Monterey instead of San Francisco. In consequence of these reports the Commander decided to continue the journey in search of the port and ship of which the heathen had given information to our explorers."

Alas! the scouts had misunderstood the

Indians. There was no ship in the estuary or harbor. Nine years were to elapse before Ayala brought the *San Carlos* through the Golden Gate, the first ship to enter San Francisco Bay.

On November 4, however, the expedition left San Pedro Creek and set forward, following the beach to the north. This was a memorable march. "We then," writes our diarist, "entered the mountains, directing our course to the northeast, and from the summit of a peak we beheld the great estuary or arm of the sea, which must have a width of four or five leagues, and extends to the southeast and south-southeast."

V

And so it was that from Sweeney Ridge on the watershed of Spring Valley Water Company's San Andres Reservoir, the main body of the Portola expedition first gazed upon the waters of San Francisco Bay. What were the emotions of Don Gaspar de Portola? Was he filled with the successful explorer's exultation? Or was there that "wild surmise" that Keats attributes to the discoverer of the Pacific Ocean, "silent upon a peak in Darien"? The unromantic truth is that Don Gaspar de Portola was lost, that he wanted to find no bay but Monterey, and was pretty sure by now that this was not it. And so the expedition pushed on.

"After three hours' travel in which we made two leagues, we halted in a valley at the foot of a mountain range covered with low, very green woods, and having near the camp a grove of live oaks on the west slope of the mountains."

This camp was on the west slope of Sweeney Ridge, just west of Lake San Andres. The next day, November 5, was Sunday, so Mass preceded the order to march. Note now that they turn south again. That camp west of Lake San Andres was as far as the Portola expedition of 1769 penetrated.

Says Father Crespi: "We traveled in a southerly direction along the edge of the estuary, but without seeing it, as we were prevented by the hills of the valley which we were following [San Andres Valley]. On the right we had delightful mountains, with many groves of live oaks and redwoods. We traveled four hours and a half, in which we must have made three and a half leagues, and halted near a lake formed by an arroyo



San Andres, second largest of Spring Valley's San Mateo County reservoirs, was a valley, not a lake, when Portola's men passed this way

of good water, with unlimited pasture and numberless geese in the same valley, in which there have been seen many tracks of large animals, which they say are bears or buffalo. Many deer have been seen in herds, and the explorers declare they saw a band of fifty of them in this place."

This, in the opinion of Professor Bolton, was near the southern end of Crystal Springs Lake, which in 1769, it must be remembered, was a small lake, nothing like the great artificially developed reservoir-lake of today. From Father Crespi's statement it is evident that Sergeant Ortega had been over this ground in the scouting operations a few days before.

What of the Indians of this particular spot? Father Crespi gives a good account of them: "Shortly before we left, three very gentle heathen came to visit us; they came as envoys from their respective villages to invite us to camp with them, and they brought us their present of black tamales and a little fruit like a plum. Their gifts were returned with some beads, and they went on with us."

There is a note of special admiration in

the words Father Crespi applies to this region. And there can be no doubt that he was pleased with the hospitable and kindly Indians. On November 6 he records:

"At nine in the morning we set out from the camp, following the same valley. We traveled through it for another three and a half leagues, through very charming country, more thickly grown with redwoods, live oaks, and oaks loaded with acorns. Two numerous villages of heathen came to meet us with demonstrations of great pleasure, bringing us a good present of pinole, black tamales, and porridge made of acorns, which relieved in part the hunger of the men, who were reduced, as I have already said, to five tortillas a day. The heathen invited us to go and camp in their villages, saying they would feed us. The commander excused himself, saying we had to go on. They were very sorry at this, and, although they were given some beads, they still showed sadness and regret because we did not accept the invitation."

"We followed the valley," Father Crespi continues, "till we came to the end of it. Here terminate the hills which we have had on our left hand between us and the estuary.

At the same time the mountains on the right hand, which with the hills form the valley by which we came, and which was called Nuestro Padre San Francisco, suddenly turn to the east, and enclose the estuary in a spacious valley. We traveled a little farther in the same direction, and in a short time halted on the bank of an arroyo whose waters descend from the mountains and run precipitously to this estuary."

This, says Professor Bolton, was San Francisquito Creek, near Palo Alto. But he points out that they turned east (from Searsville Lake) before making camp, and halted near the bay.

Next day, November 7, the scouts were sent out to find, if possible, more definite information about "the port and the ship." Meanwhile the expedition rested, and, being on short rations, the men ate acorns—result, indigestion and fever.

On the night of November 10 the scouts returned to report that they had mistaken the

Indians in the matter of a port and a ship.

Furthermore "they said that all the territory which they examined to the northeast and north was impassable because of the scarcity of pasture and especially because of the ferocity and ill-temper of the heathen, who received them angrily and tried to stop their passage." The result was a solemn council of war. Portola wanted to go forward, but all his officers voted in writing to turn back—they were convinced that the port of Monterey was not ahead of them.

Their stops in San Mateo County on the return march to Monterey are thus identified from Crespi's brief notes by Professor Bolton: "The expedition camped on the 11th near Woodside; on the 12th at San Andres Lake, or possibly at Pilarcitos Lake; on the 13th on San Pedro Creek; on the 14th at San Vicente Creek; on the 15th at Half Moon Bay; on the 17th at Tunitas Creek; on the 18th at Pescadero Creek; on the 19th at Año Nuevo Creek."

San Mateo County in 1769

By George Davidson, Ph.D., Sc.D.

[The author of the *Pacific Coast Pilot* knew his California as few men before or since have known it. The following analysis of the route of Portola in San Mateo County was written by Professor Davidson for the Geographical Society of the Pacific, of which he was president.]

AFTER much earnest conference, and consultation of the Coast Pilot of Cabrera Bueno, Portola determined to examine the coast line to the northward, notwithstanding the provisions had run low, and that every-one of the party was ill.

It was the decision of a masterful leader, and led to remarkable results; it reawakened Spain . . .

Following the expedition northward we recognize the following stopping places:

La Cañada de la Salud is the Año Nuevo Creek of the present maps; it is locally known as Big Gulch. . . . From this place they moved . . . to another camp named La Rancheria de la Casa Grande . . . They crossed the present Whitehouse and Gazos

Creeks, and encamped a short distance east of Pigeon Point, where there is a roadstead open to the south. Here they found a rancheria with a large, notable spherical structure which they named the Casa Grande, but of which we find no record or tradition . . .

On Tuesday, October 24th, the party started under the guidance of two Indians from Casa Grande, and traveled four leagues to a camp at a rancheria not named by Costanso, but which we fix at the San Gregorio Creek . . .

On Friday, the 27th, they traveled two short leagues in three hours, and encamped at a stream with little water and no firewood. We place their stopping place at the Purissima Creek, on the south bank. . . .

On Saturday, October 28th, Costanso writes they traveled two leagues northward from the Rancheria de las Pulgas to El Llano de los Ansares (the plain of the wild



Ortega, the great scout, explored this region of Crystal Springs Dam, and the main body of the expedition camped near the southern end of the reservoir

geese), and Father Crespi and Father Gomez said mass, and then the train started at ten o'clock and made two leagues in two and a half hours. They encamped close to the mouth of the Pilarcitos Creek, one and one-third leagues north from the Purissima. From this encampment Costanso writes: "To the northwest we saw a great point of land that reaches far into the sea, and at the extremity much low land with many great rocks which appear as farallones that run to the westward." Later he describes "two farallones of very irregular figure with peaked tops."

The point of land lying to the northwest and forming the roadstead of Half Moon Bay, open to the south, is the Pillar Point of our charts; it is an extensive mesa that rises to 181 feet at the middle, and was called the Corral de Tierra by the early Californians. One of the two principal farallones lying one-fifth of a mile from the point is about one hundred feet high, very sharp peaked and split from top to bottom. It is named the Steeple, Sail or Pillar Rock on different charts and maps. It is a well-known landmark to our navigators.

Under the date of the 30th, Father Crespi

describes the anchorage of Half Moon Bay as a good small bay . . .

On Monday, the 30th, the expedition left the camp on the Pilarcitos, and reached the creek one mile north of the Montara Fog Signal, where their progress was effectually blocked by the southwestern flank of Montara Mountain reaching the shore . . . At the foot of the rocky barrier which confronted them ran a small stream from the mountains. This stream is now known as Martini's Creek. The barrier formed a "rinconada" and shelter from the north winds. . . . In the afternoon the sergeant was sent out to find a passage over the promontory of the Montara Mountains.

The geographic position of this camp of the 30th has always been in some doubt, but with the different narratives before us, a personal acquaintance of the locality, and the contoured maps of the United States Coast and Geodetic Survey, we have satisfactorily solved the difficulty. It was one mile and a quarter northward of the present Montara Steam Fog Signal Station, and two miles southward of the northern extremity of Point San Pedro.

On Tuesday, the 31st of October, after the

sergeant and soldiers had cut a trail across the high, steep ridge to the north, the expedition crossed this difficulty, and made one league only that day. This well-known headland is the rocky, abrupt, ocean termination of the mountain ridge that stretches hence southeastward through the Peninsula of San Francisco, and in fifty statute miles attains an elevation of 3,798 feet at Loma Prieta, in latitude $37^{\circ} 07'$. Where the later Indian trail crossed it the height is over one thousand feet, but this party may have crossed it somewhat lower. When the party reached the top they described what they denominated "una Bahía Grande" which stretched far out to sea under a distant point of land or an island. That point was the three-miles broad, precipitous face of the headland of La Punta de los Reyes, distant forty geographic miles and reaching 597 feet elevation. Farther to the west northwest were seen six or seven white Farallones; and then turning to the eastward of Point Reyes were seen "barrancas blancas," white cliffs, that appeared at the mouth of an estero. When the haze which partly obscured the Head and vicinity had cleared away Costanso was able to establish the fact that Point Reyes Head was not an island, as had been conjectured by some of the party.

The party then made the sharp, rugged descent to the laguna that receives the waters of the small stream called on the late charts San Pedro Creek. This lagoon is behind San Pedro Cove, which is formed by the recession of the low shore on the north side of Point San Pedro. Camp was fixed on the side of the lagoon, . . .

At any place near the sea level in San Pedro Cove the observers could not have seen the objects mentioned because they were below their horizon; and therefore they must have ascended at least two or three hundred feet, whence the tops of the Southeast Farallon, the highest part of Point Reyes, and the upper part of Ballenas cliffs could be seen above the horizon.

Upon consulting the Coast Pilot of Don Joseph Gonzales Cabrera Bueno of 1734, they decided they were looking at the old Puerto de San Francisco of the Spanish galleons, the *Portus Novae Albionis* ascribed to Drake . . .

We have fixed his "barrancas blancas" as the southern face of the whitish cliffs of

Ballenas (or Bolinas) Point that forms the western shore of Ballenas Bay. Costanso was twenty nautical miles from the cliffs that are 175 feet high, and could not see the inside lagoon; but he was looking almost directly through the deep, narrow valley that runs straight from Ballenas Bay to Tomales Bay for fourteen miles, with the mountains over one thousand feet high on either side. The Cuchilla Grande on the west is 1,409 feet, and the flankers of Tamalpais over 2,000 feet. Therefore he imagined that he saw the mouth of an estero that appeared to run inland on the east side of the white cliffs . . .

The transverse break of the Golden Gate can not be seen even when one knows where to look for it.

November 1st, 1769. On this day the sergeant and the soldiers saw the southeast part of the present San Francisco Bay, but they could not get back to report.

November 2nd. This was All Saints Day. . . . At night the hunters returned, and reported they had seen at the northern part of this Puerto de San Francisco an immense arm of the sea or estero, which ran as far inland as they could see, and looking toward the southeast . . . These men could not have seen the Golden Gate; the high lands southward of the entrance absolutely prevented its being seen from their position.

If they were on the high hills two miles east or east-northeast of the camp they were looking upon the waters of San Francisco Bay. They could have noted Point Reyes Head as well as the estero at Ballenas; and the Twin Peaks projected upon Point Diablo and the high lands adjacent on the north side of the Golden Gate.

Mount San Bruno, 1,315 feet high, lay squarely in front of them six miles to the northeastward, and prevented their seeing much of the bay north and west of Oakland Point.

November 3rd. During the night the exploring party under Sergeant Ortega, which had started on the first, returned discharging their firearms, and confirmed the report of the hunters. They stated furthermore, "from equivocal signs of the Indians," that at a distance of two days' journey from San Pedro Cove there was "a port and a ship therein."

These Indians, who had perhaps seen galleons make the coast, [*Continued on page 11*]

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ON the cover of this issue of SAN FRANCISCO WATER there is reproduced through the courtesy of The Family, and of Mr. Haig Patigian, who painted it for that club, an oil painting entitled "The Vision of Portola." This painting commemorates the performance of a little play of the same title, written by California's great poet, George Sterling, and given for the members of The Family at their Farm in the Portola Valley of San Mateo County in the summer of 1911. By permission of The Family the Sterling play is here published for the first time.

George Sterling was deeply impressed by the historical importance of the first Portola expedition and by the character of its commander. He dealt with the theme more than once, although his poems on the subject were not included in any of his published volumes.

* * *

San Mateo County in 1769

[Continued from page 10] or had heard traditions of Drake's ship, 1579, or of the wreck of the San Augustin, 1595, or of Vizcaino's visit in Drakes Bay in 1603, doubtless intended to inform the Spaniards that two days' travel to the northward from their camp was the entrance for boats and ships, such as they had seen, into this newly discovered estero.

It is also evident that the explorers had not followed the beach to Point Lobos; in fact they could not for at least two miles, and thence they could have followed it for two more, when they would be compelled to reach into the hills that are nearly five hundred feet high, and whence they could see part of San Francisco Bay five or six miles to the eastward. One curious feature is not mentioned, whether they advanced far enough

along the beach to see Lake Merced, only eight miles northward of the camp.

As neither the exploring nor the hunting party had a glimpse of the Golden Gate, but were two days' travel therefrom; and as to Costanso and to the Commander Portola, and to all the party, the outer coast line seemed high, compact, and unbroken to the northward beyond their encampment, it was decided to cross the hills directly overlooking the bay and explore around the south and southeastern shore of this immense inland sea.

Today this decision appears to many people to have been unfortunate when one or at most two days of easy travel—only thirteen miles northward—would have brought them to the Golden Gate, and have given them a more wonderful discovery to call forth exuberant description; but they were guided by what they actually saw.

They had twice before been barred by mountain ranges and forced into the interior, by the Sierra Santa Monica, and by the Sierra Santa Lucia. Now, in the clear atmosphere of November, stood up the Twin Peaks, 925 feet, and the bold transverse crest of Mt. Tamalpais (2,594 feet high), stretching its western flank as a great barrier to the very ocean near Ballenas Bay, and the Cuchilla Grande (1,409 feet) to the west of Ballenas.

We must believe they exercised their best judgment and that the palpable estero before their eyes was far more satisfactory than the questionable signs of the Indians.

One thing is certain, they had looked upon part of the future city of San Francisco.

November 4th. . . . Almost at the outset the train was compelled to leave the beach, and in a very short distance commenced the ascent of the hills lying to the northeastward, which reach an elevation of thirteen hundred feet and are grass covered. As usually followed in this country, the traveler takes up a ridge whence he can have a good outlook as well as better traveling. Upon reaching the crest-line of the hills that trend southeast and northwest, they descended and entered the cañada of San Andres, the head of which is five hundred and twenty feet above the sea. Then they traveled south-southeast through this narrow cañada between high hills that were wooded for about one mile, and halted at sunset. Cos-

tanso says they made two leagues; and this would bring them to the small unnamed lagoon shown on the United States Coast and Geodetic Survey map of the Peninsula of San Francisco (1869), exactly two miles west by south from Millbrae Station on the bay shore. The position of this lagunita is near the eastern angle of the San Pedro Rancho as laid down on Professor J. D. Whitney's map, where he has a house located but no water other than the stream.

Neither Costanso nor Father Crespi mentions any fresh water. The Father says they encamped at the foot of the mountain covered with low wood, very green; and there was a semicircle of oaks skirting the mountain on the west. Naturally they would select a camp where water was to be had; and so we find that on the return trip the party encamped at this place beside "una Lagunita" (November 12th).

The camping ground is now covered by the waters of the reservoir of San Andres Lake.

November 5th. The expedition was now in the "Cañada de Raymundo" of the later maps, Costanso's "Cañada de San Francisco," and it may be well to give a brief description of it. It lies on the eastern flank of the main range of mountains running northwest and southeast through the Peninsula of San Francisco. The northwest projection reaches the sea five and a third miles north of Point San Pedro; and the southeast projection at Los Trancos Creek, west-southwest from Mayfield, a total length of twenty-four miles.

It is a very narrow valley, recognized as a line of faulting by geologists, and is fifteen miles long between the northwest and southeast divides. In the part traversed by the Portola party the breadth is less than a quarter of a mile wide, and the hills on the west rise sharply to eleven hundred feet above the sea, and on the east side they rise to six or seven hundred feet, with slopes not so steep. The lowest point in the cañada is where the San Mateo Creek breaks through the eastern ridge on its way to the bay; and is about one hundred and eighty feet above the waters of the bay. In the later "fifties" we found little more than a trail through the chaparral and willows of this cañada; and traveling was slow. We entered from the north. In later years a road was made

through the San Mateo Cañon. Today all the old landmarks are obliterated by the two reservoirs, San Andres Lake north and Crystal Springs south, which have a total length of eight and a half miles.

On Sunday, the 5th, after the celebration of the mass, the party began the march at nine o'clock with very cloudy weather. Costanso's notes are very brief. Father Crespi's moderately full. They marched three and a half leagues in four and a half hours in a general direction to the south-southeast, parallel with the bay shore which they could not see on account of the "lomaría" to the east. On their right hand the sierra was beautiful with many areas of oaks, redwood, and smaller trees, interspersed with areas of pasture. They stopped at a small stream and lagoon which formed an arroyo of good water and broad pasture land. There were plenty of wild geese, and they observed the tracks of large wild animals, as the bear and bulls (elk). Many herds of deer were seen, some of the explorers declaring they had counted fifty manadas. In these last days they saw many madroños (the strawberry tree, *Arbutus unedo*), but the fruit was much smaller than that of Spain although of the same kind.

The Indians from adjacent rancherías invited the people to visit them, and there was a trading of glass beads for black tamales and a fruit like a cherry (the *Cerasus ilicifolia*, over half an inch in diameter, with a large kernel).

This encampment was at the "laguna Grande" of Whitney's map (1873) about two miles south of the western entrance to San Mateo Cañon. It received and discharged the waters of the south branch of San Mateo Creek, and is now covered by the waters of the Crystal Springs Lake or reservoir. . . . It may be asked why Portola did not follow the north fork of the San Mateo Creek through the cañon, because it was evident it must reach the Bay. A very short reconnaissance must have satisfied him that the crooked rough bed of the stream lying between high and rocky banks with many overhanging trees, was not a practical route for his weary animals and his large body of sick people. . . .

November 6th. It has been customary to assume that the party continued its course to the southward of Laguna Grande over the



Father Crespi was unusually struck with the beauty of growing things in this region. Charming Portola Woods takes its name from Don Gaspar, of course

high land five hundred feet above the sea at five or six miles from their encampment of the 5th. This high land, about a mile in extent northwest and southeast, divides the waters flowing northwest from those flowing southeast. Then down the southern waters three miles farther to a point near Searsville; and from this place turned eastwardly and down the San Francisquito Creek to the Estero or Bay of San Francisco. On this route the party would have passed the notable "Twin Redwoods" at the railroad crossing between Menlo Park and Palo Alto. There is now but one of these trees standing and it is the smaller one, with a height of about one hundred and thirty feet.

The length of this route is eighteen statute miles to the bay, and it must be rejected. . . .

The day's march was through a beautiful country; the hills to the west were covered with redwood, live oak, and other oaks loaded with acorns . . . Father Crespi makes the distance three leagues to the end of the day. They reached the end of the cañada and the termination of the hill range that lay on

their left, while the mountains on their right turned to the eastward and appeared to encircle the estero in a spacious valley . . . The encampment may be confidently placed near the county town of Redwood.

* * *

Lo! strange waters! And lo! the gleam
Of mighty waters alien and wide!
A tremor of light at the world's extreme,—
The port where the ships of a world shall
ride!

So the hardy captain found our Bay—
Toiling hence by the ocean's roar
From the sprawling oaks of Monterey
And the pines that sigh by the granite
shore.

So on the San Matean hill
Stood he at sunset, gazing forth
On the secret waters, litten and chill,
That lost their light in the misty north.

—George Sterling.

The Vision of Portola

By George Sterling

SCENE, the present grove of The Family in Portola Valley. TIME, the last of twilight. A band of mounted men emerges from the shadows of the grove, DON GASPAR DE PORTOLA at their head. The troop consists of himself, his two officers, PEDRO FAGES and MIGUEL DE CONSTANSO, and ten Troopers, the latter clad in jerkins of leather, much travel-stained. Two Priests, also mounted, are of the company. Their names are FATHER GOMEZ and FATHER CRESPI.

Portola. Halt! In this pleasant spot we'll pitch our camp.

Don Fages, see that all's in order. I Will fare a little westward to yon hill. For as ere eve upon the mountainside We wandered, half I thought I northward glimpsed Great waters. Fare ye well a time.

[PORTOLA rides onward. The others dismount, FAGES and CONSTANSO giving their horses into the care of the Troopers. A camp-fire is built and lit, and food and wine passed round. FAGES and CONSTANSO sit apart from the Troopers, who talk in a low tone among themselves.]

Constanso. Didst note, Pedro, that good Don Gaspar's brow

Is ridged with care?

Fages. Of late it has been so.

Constanso. Would we might find this dubious port we seek.

O Pedro! North and ever north we ride, Beyond the limits that Cabrera gave, And seek the gulf he christened Monterey: Its haven eludes us.

Fages. Even so.

Yet have we kept the coast, or gazing down From heights that Christian foot trod not till now,

Have sought in vain that harbor.

Constanso. Sought in vain.

Yet ever on, through savage men and wilds, The starlike soul of Portola contends, Piercing this night of heathendom.

Fages. But when,

When shall the quest be done? Think you, Miguel,

Cabrera's chart was faulty? Did he err?

Constanso. Nay! The great pilot erred not.

It is we

That stray in darkness. Yet the hills reach north

Barring the sea forever.

Fages.

It may be

That soon we come upon the Russians' fort That lately they have builded in these wilds.

Constanso. 'Tis like that Galvez sends us to the north

Even for that. But with our scanty ranks How shall we drive them from their high redoubt?

Fages. All is a mystery. Behind the plan For missions and the cure of heathen souls, A vaster purpose hides. Methinks that Spain Would hold both Californias.

Constanso. But why?

For scarcely in the lower land have we Sure footing. It would seem a thousand years Must grope their passage to eternity Ere this wild land be tamed, and fit for homes.

Fages. So seems it—now. But, good Miguel, enough

Of doubts! Let's give our woes a merry end!

[To the Soldiers:]

A song! A song of those we love!

Soldiers.

A song!

[The Soldiers sing. Before the end of the song PORTOLA rides in and dismounts.]

Portola. Where are the padres?

Fages.

They essay to heal

The mules that fell when we were in the hills Today. Three were sore injured.

Portola.

Send us Gomez.

[FAGES retires, and appears in a moment followed by PADRE GOMEZ, PORTOLA in the meanwhile engaging CONSTANSO in conversation.]

Portola. Father, what think you of this land?

Gomez. 'Tis fair.

Shall we not build a mission hereabouts?

Portola. Some day we'll found a mission, and your hands

Shall be outstretched to reap a thousand souls.

These Indians shall be your heritage.

But now, good Gomez, 'tis another thing We seek.

Gomez. Aye, aye! That port of Monterey Viscayno found.

Portola. He found it with his ships: But we do wander in this wilderness, And speak by signs to these barbarians,

Nor find that harbor. I am just returned
From yonder hill. Far to the north and east
I gazed, but o'er the plains was poured a fog
In mystery on mystery. The land
Appalls me. It is far and lone and sad.
Who will leave friendly Mexico for this?

Gomez. I! . . .

I tell you that to save one simple soul
I'd cross yon sea, and on its bleakest isle
Labor and die forsaken by my kind!
To save one soul, to save one savage soul!

Portola. Aye, aye! such is thy nature. As
for me,

I do abhor these solitudes, and now
Would fain return to where our ships await;
But in far Mexico great Galvez sits
And plans an empire, mindful of
the Russian.

I am an arrow that his bow has shot.
In the ocean's voice
I catch his last command. The very night
Seems but his shadow. I must on—
but whither?

Gomez. I'll ask our God for thee. Per-
chance He'll send

A sign, a voice, a guide.

Portola. None else can say

Unto what end or aim or mortal good
We wander in this desert which no man
Will make his home for centuries to come . . .
But let's to sleep. At sunrise I will call
A council. We'll decide if furthermore
We northward hold our way, or to the south
Haste, and the welcome shelter of our ships.

[The Troopers disperse. PORTOLA wraps his cloak about him and lies down by the fire. Beyond him sleep CONSTANSO and FAGES. The fire burns low. PORTOLA sleeps. From the depths of the grove beyond him now approaches, slowly, a figure in the guise of an angel, white-robed. It comes to PORTOLA. takes him by the hand, and leads him several steps forward. During the dialogue that follows, PORTOLA'S eyes are closed and he speaks as if in slumber, with a deepening awe in his tones.]

The Spirit. I am the angel of the years
to be,—

Star of that night wherein the future lies.
Vision I grant, and light on times unborn,
And prospect of inevitable things
That are not, yet shall be. Gaze,
Gaspar, gaze

To south: what seest thou?

Portola. Behold! the path
I and my hand have trodden is become

A highway to my people. Mexico

Puts forth her sons and daughters, and
the land

Is happy with their homes. Far, far away,
Extend the fertile acres. Over all,
A silver music cast from mission tow'rs
Tells of salvation to the savage. Still
They take the royal highway, and I hear
The sound of men and horses hurrying
north—

Ever north. *Oh! hearthstones of my race!*

The Spirit. They take what they shall lose,
and come in hope

Who soon must pass. God dreams a wider
dream

Than theirs. Yet have they shown the path
to man. . . .

Gaspar, look to the east!

Portola. Whence are those men, those
eager multitudes?

The tramlings of their cohorts shake
the plains!

They seem a flood, whose waters in their rage
The mighty mountains bar not. Now at last
The earlier torrents reach the rocky flanks
And hurry through the gorges, and come
forth,

Resistless, to these valleys.

The Spirit. Turn again,

O Gaspar, to the south: what seest thou?

Portola. I see smoke rising out of Mexico,
And hollow echoes of a thunder spent.

I see a Banner never seen till now.

The Spirit. O Gaspar, gaze thou west-
ward, for those hills

Are now as crystal to thee, like the years.
What seest thou?

Portola. I see a thousand sails

That northward, ever northward, urge
the keels;

They pass me, hastening northward.

[PORTOLA turns his face slowly northward, following the ship's course, till his gaze is turned full to the north. An expression of awe and amazement comes over his countenance.]

The Spirit. And what *there*
Beholdst thou, Gaspar de Portola?

Portola. I see a city rising on far hills.
It spreads, and masts and towers crowd
the sky.

Queen of this sea and all the virgin west,
She sits her throne in beauty, holding forth
Her scepter unto many lands and men.

They come; they meet: they serve her. In
her courts

Are many laughters. Now she casts abroad

A largess to the nations of her gold,
 And feeds them with her grain, and with
 her grapes
 Maketh them merry. Was there ever yet
 A queen so gracious? Still her realms
 expand
 And still arise the houses and the groves,
 And now—nay, pity, pity!

[*An expression of terror crosses his face.*]

The Spirit. Take thou heart!
 Tell what thou seest!

Portola. Christ! the solid earth
 Is shaken, and she falters on her throne!
 Her walls are down! her temples pass in fire!
 A pall of smoke conceals her from my sight!
 God! she is dead! she will not smile again,
 Who was so fair, so gracious!

[*PORTOLA sinks to one knee, and covers his face with his mantle.*]

The Spirit. Gaze once more,
 O Portola! and trust the eternal ways.

[*PORTOLA still on one knee, but with mantle cast back and arms outstretched to the north.*]

Portola. Oh! still she lives, and fairer
 than before!
 Her children still surround her and
 her tow'rs
 Gleam in the morning! Over sea and land
 They come in homage, for a mystic flame
 Is on her turrets, and her deathless lips,
 Wiser for sorrows past, call unto men
 With promise of new freedoms. Still the years
 Bless and replenish, and make wide
 her fame.
 Her sister cities over all the world
 Envy yet love her. Still the winds of good
 Cleanse her and fill her and make clean
 her heart
 With vaster knowledge of man's need of man.
 Now Justice, and not Charity, hath sway.
 Each in each other sees his brother's face.
 The weak grow strong, the strong lose not
 their strength,
 And all men, now one purpose, face the
 years—
 One purpose for all wisdom, joy, and good.
 Behold! mankind shall be one Family!

The Spirit.

[*Taking PORTOLA, who rises, by the hand.*]

Gaspar, the secret light by which thy soul
 Hath gazed into the years I now withdraw.
 Remember. Yet that hidden radiance
 Shall leave some trace of glory; thou
 henceforth

Shalt face thy perils with a stouter heart,
 Till victory be thine, O thou first knight
 And champion of this imperial land,
 Incomparable California!

[*The Spirit leads PORTOLA once more to his place by the camp-fire. He sinks down, his eyes still closed and his slumber still unbroken. The Spirit withdraws on the path by which it came, slowly and silently. A deep hush is on the grove. PORTOLA suddenly stirs, lifts himself on one arm, and stares wildly about him. He staggers to his feet, still searching the night with his eyes. Suddenly he cries out.*]

Portola. O Fages! Gomez! Constanso!
 Crespi!
 Come swiftly.

[*PORTOLA is suddenly surrounded by his officers and men, amid clashing swords.*]

I would tell you! Fages! Gomez!

[*There are cries of "Aye! tell us!"—"Where is the foe?"—"What have you seen?"*]

Portola. Lo! Even now it seemed that one
 stood here

In radiance, and he said—what did he say?
 I saw—what saw I? Glories? Terrors!

Dreams!

Lo! vision was upon me, but some wind
 Has swept the waters of my memory.
 And all that lay enmirrored there is gone—
 Aye, blurred and perished! Christ! what
 was that dream?

For I have gazed on splendors and despairs,
 And on the night skies of futurity
 Have seen strange stars and shadows, and
 beheld

Vast morning surging eastward on the world!
 What flags were those? what faces? and
 what hope

Cried from that music? Christ! but all is fled!

Gomez. Yet has that vision come to you
 from God.

For some new light is in your eyes. It seems
 As though a saint had laid his palm
 Upon your brow, or led you by the hand.
 This is God's work.

Portola. I know it is of God;
 For now fresh hope and strength exult
 my soul,

And now I feel this new land shall be ours.
 It is not long before the morning breaks—
 Let us go forth to meet it with a song—
 The road is free before us. Onward, all!
 The world shall know of California!

[*The troops form behind PORTOLA, and depart, singing.*]

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ET EVER ON ,
THROUGH SAVAGE
MEN AND WILDS ,
THE STARLIKE
SOUL OF PORTOLA
CONTENDS , PIERCING THIS
NIGHT OF HEATHENDOM , ,

GEORGE STERLING, IN
"THE VISION OF PORTOLA"



July

SAN FRANCISCO

Water



SUCH art as this cannot be done justice to with the pen; diagrams would be necessary, showing how in every case the lines of the sculpture harmonise subtly, or clash to be more subtly harmonised, with the movement, the immensely varied, absolutely spontaneous movement of the water; the sculptor, become infinitely modest, willing to sacrifice his own work, to make it uninteresting in itself, as a result of the hours and days he must have spent watching the magnificent manners and exquisite tricks of natural waterfalls — nay, the mere bursting alongside of breakwaters, the jutting up between stones, of every trout-stream and mill-dam.

VERNON LEE
In Old Italian Gardens

SAN FRANCISCO WATER

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“Fountains Dispersed Abroad”

By the Editor

THE Greeks and Romans placed their city fountains near the temples of the gods, thus enforcing upon the populace the thought that water was the gift of Heaven. In Greece it was the usual thing to dedicate the city fountains, no less than the wayside springs, to gods and goddesses, nymphs and heroes. There was a religious purpose in this, and perhaps also a policy of expedience, for *hoi polloi* were thus impelled not only to reverence water but also to avoid wasting it.

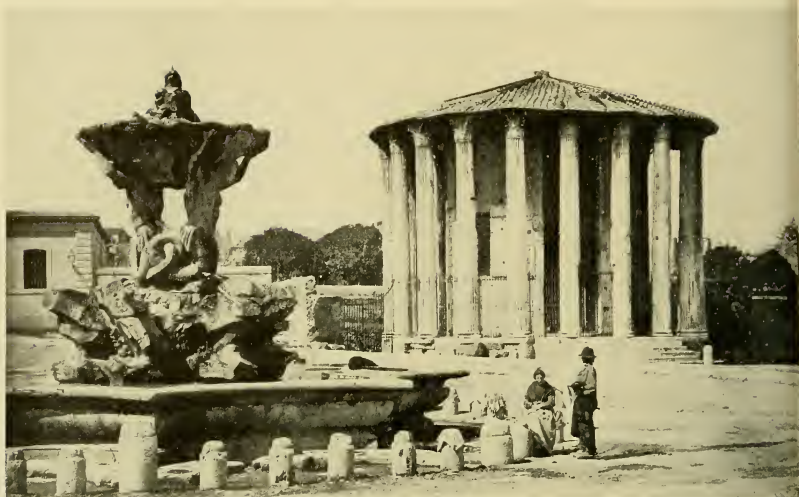
Some of the most beautiful stories of Greek mythology are associated with fountains. The famous fountain of Pirene at Corinth was formed of white stone, and contained a number of cells from which the water flowed into an open basin. This beautiful fountain took its name from the nymph Pirene, who could not be consoled when her son was slain by the arrows of the huntress Diana. Poor Pirene shed such copious tears that the gods in pity changed her into a fountain. It was at the fountain of Pirene that the Corinthian hero Bellerophon found Pegasus, the winged horse of the Muses. Having undertaken the fearsome task of slaying the Chimaera, Bellerophon passed the night in the temple of Minerva at Corinth, and while he slept the goddess gave him a golden bridle and showed him Pegasus drinking of the fountain of Pirene. The horse came willingly at sight of the magic bridle; Bellerophon mounted, sped through the air, and slew the Chimaera.

Another Corinthian fountain, that of Glauce, was associated with the horrifying crimes of the witch Medea. The demigod Jason jilted Medea when he fell in love with

Glauce, or Creusa, as she was also called, a beautiful princess of Corinth. Medea had done many strange and terrible deeds to win the love of Jason, and she sought a hideous revenge for his infidelity. Pretending forgiveness, she sent a magnificent robe as a gift to the bride. But the robe was poisoned, and no sooner had Glauce put it on than she was attacked by fiery torments. In her agony she plunged into a fountain and was drowned. The name of the unhappy bride-to-be was given to the fountain.

“In the vale of Enna,” says Charles Mills Gayley, “is a lake embowered in woods, where Spring reigns perpetual. Here Proserpine was playing with her companions, gathering lilies and violets, when Pluto saw her, loved her, and carried her off. She screamed for help to her mother and her companions; but the ravisher urged on his steeds and outdistanced pursuit. When he reached the river Cyane, it opposed his passage, whereupon he struck the bank with his trident, and the earth opened and gave him a passage to Tartarus.”

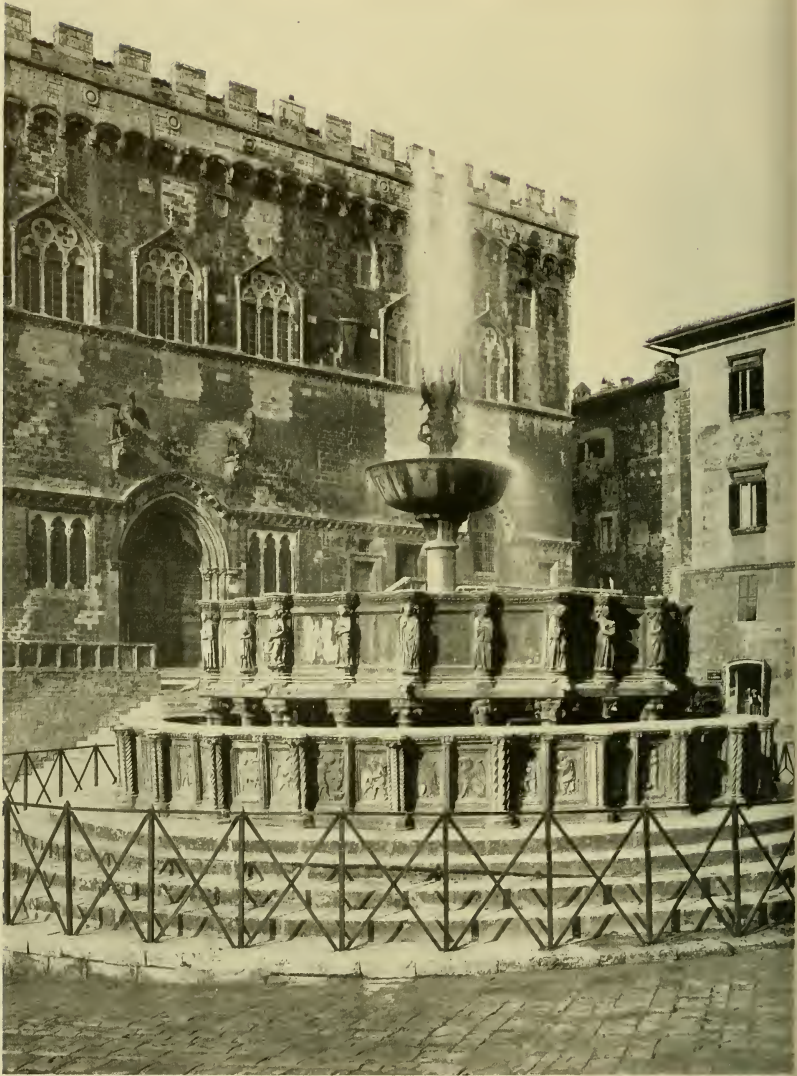
Thus begins one of the most touchingly beautiful stories of Greek mythology—the rape of Proserpine and the heart-broken search for the lost maiden by her mother, Ceres. The wanderings of Ceres brought her at last to the river Cyane, whose guardian nymph feared to tell her directly of Pluto’s actions, but conveyed the story none the less by taking up the girdle Proserpine had dropped in her flight and floating it to the feet of the mother. Thereupon Ceres cursed the innocent earth, precipitating drought and famine, flood and [Continued on page 14]



Paganism and Christianity both find expression in the fountains of Rome. Above, the Temple of Vesta, with its ancient fountain. . . . Below, the fountain of the Pauline Waters, so called because Pope Paul V restored Aلسietina or Augusta, one of the ancient aqueducts, rearing this fountain in 1612. The same Pope restored the aqueduct of Trajan.



The fountains in the piazza of St. Peter's always receive special mention as being in exceptionally good taste. . . . All pilgrims to the Eternal City know also the fountain in the Piazza of Spain, in front of the noble stairs leading to Trinita de Monti, where the flower-venders display their blossoms that the pious may buy for the altars.



Perugia has no monument of the great thirteenth century more universally admired than "Fonte Maggiore," which throws its delicate streams upward in front of the Municipal Palace. It was designed in 1277 by Nicholas and John of Pisa, and is one of the finest works of art of its period. Ruskin paid high tribute to this fountain.



This ancient well-head stands in the courtyard of the Montecatini Palace at Ferrara. In that lovely old city there is no treasure of the olden times more glamorous than this masterpiece of stone and iron. Forgotten generations of water-carriers wore down this pavement. They came here many times for water to wash away the red stains of war.



Caserta has been called "the Versailles of the Kings of Naples." The royal palace and the spacious gardens date from 1752. The great fountain has an upper and a lower cascade, as pictured here. Apollo presides over the upper, which is majestic and calm, while the lower, with its "finny monsters," roars with tumultuous fury.



The fountain of Neptune in the piazza of the same name is outstanding among the Renaissance glories of the wonderful city of Bologna. It was designed by the great John of Bologna, to whom the world of beauty-lovers is also indebted for the Well-head of the Lion that is pictured on the cover of this issue of SAN FRANCISCO WATER.



In the Marine Plaza of Palermo in Sicily stands this fine fountain designed by Paul Amato in 1698. The exuberant handling of mythological subjects was characteristic of that period of transition, but the effect was not always as happy as was obtained here, where, in spite of detail, the water is permitted to dominate.



Above, one of the famous fountains in the Court of the Oranges of the Cathedral of Cordova, formerly the Mosque al-Jami. . . . Below, the well-head in the courtyard of the Church of St. Stephen in Bologna. Note the contrast between the architectural sunniness of the Arabian city and the somber beauty of the Italian town.



Above, another famous fountain in the Court of the Oranges, Cordova. This was the fount of ablutions, where the Moors purified themselves before entering the mosque. . . . Below, a fountain in the Arabian Gardens of the Alcazar at Seville. Reminiscences of this spot are aroused by the new domestic architecture of California.

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EDWARD F. O'DAY, Editor

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"Water . . . bubbling up in every street and market-place in abundant gushings, or poured in a roaring torrent under the arches of gigantic fountains."

THIS ISSUE of SAN FRANCISCO WATER is dedicated to the dignity of water as expressed in world-famous fountains and well-heads.

"Such art as this," Vernon Lee writes in a delightful essay on fountains, "cannot be done justice to with the pen; diagrams would be necessary." It will perhaps be conceded that the photographer has been able to do a very fair measure of justice to this art of fountain-making.

The photographs were thoughtfully selected during a trip abroad by Mr. Gardner Dailey, to whose judgment Spring Valley Water Company refers all its artistic problems. Mr. Dailey selected this series of pictures with the same delicate insight that he applied to the assembling of the very unusual aqueduct pictures that were reproduced in this publication for January, 1927. It is the editor's hope that this Fountain number will yield as much pleasure and profit as that Aqueduct number seems to have given.

As an old San Francisco institution, Spring Valley Water Company is deeply interested in the progress of this city, not merely along industrial but also along artistic lines. When Willis Polk designed the Water Temple at Sunol, and when Arthur Putnam designed the fountain at Pilarcitos, they were helping this Company to express its understanding of the dignity of water. Mr. Dailey was doing the same thing when he gave us the beautiful Gate House at Calaveras Reservoir.

In a modern water supply like Spring Valley there is no call for those great public fountains that formed an integral part of

the ancient Roman water system. The water consumer does not go to the fountain, pitcher on shoulder, in this era of American life.

Nevertheless there is a place for fountains in a city like San Francisco. Our charming little Stevenson Fountain in Portsmouth Square is known in every nook and corner of the world where a lover of Robert Louis Stevenson abides. It was the first memorial ever reared in his honor, and the city owes it to the emotions raised in the breast of Mr. Bruce Porter by the death of R. L. S. In rounding out his design Mr. Porter enjoyed the collaboration of the late Willis Polk.

Other San Francisco fountains of artistic distinction are the Donahue Fountain, designed by Mr. Douglas Tilden, and presented to the city by Mervyn Donahue in memory of his father, Peter Donahue; and the Native Sons' Fountain, the work of Mr. Robert Aitken, which the city owes to the munificence of the Hon. James D. Phelan.

Some day perhaps a monumental fountain will rise in the Civic Center. If of proper proportions it would undoubtedly serve to dwarf the too magnificent distances of that beautiful place and draw the buildings together in closer intimacy.

Some day, too, perhaps we shall have a fountain rising over the marvelous Spring of Fruitfulness, El Polin, that was so dear to the hearts of our Spanish and Mexican predecessors here and that is so regrettably neglected nowadays.

We are but a young city, and though the graces of life both public and private have been cultivated here in a becoming spirit, much remains to be done by public enterprise and by private benefaction. It is to be hoped that when "fountains are dispersed abroad" over our great city, they will be designed and erected according to that noble Burnham text so dear to Willis Polk: "Make no little plans . . . Aim high in hope and work . . . Let your watchword be order, and your beacon beauty."

* * *

ON the cover of this issue of SAN FRANCISCO WATER is reproduced the exquisite Well-head of the Lion which stands in the courtyard of the Bevilacqua Palace at Bologna. This is one of the finest courtyards in Europe, a monument to the greatness of John of Bologna, who also designed the well-head. It dates from 1481.



The Garden of the Water Surprise in the Alcázar at Seville. The jets were not released until the garden was full of guests, thus providing for everybody an unexpected drenching. That was a form of Moorish humor worthy of the royal jesters who romp through the Arabian Nights. The joke is sometimes played in American gardens, but is not greatly relished.



This little garden of a Spanish gentleman in the famous university town of Salamanca has a lovely fountain, which, though quite modern, was designed in the best traditions of Old Spain. Water here must be used thriftily, but that it is used with judgment may be inferred from the sweet profusion of growing things.

“*Fountains Dispersed Abroad*”

[Continued from page 1] plague. But finally the fountain Arethusa made intercession with Ceres, telling her how unwillingly the earth had opened for Pluto; and Ceres revoked her curse.

Stories like these indicate how profoundly the Greeks venerated their fountains. “Water is best,” sang Pindar in his famous ode, and the water of rivers, springs, and artificial fountains was personified—nay, deified—by the early myth-making poets. Greece was always a land of song and story, and one can easily picture the women and children clustered at the fountain to fill their pitchers, telling and retelling the lovely legends that had come down to them from time immemorial.

Some of those very ancient Greek fountains were elaborated with sculpture. One at Corinth—a true City of Fountains—had a bronze statue of Neptune standing on a dolphin from which the water flowed. That motive has been repeated endlessly ever since. What was the name of the sculptor who thought of it first there is now no way of knowing. His imagination has been a boon to sculptors throughout the ages. The fact that Neptune ruled *salt* water has never been permitted to interfere with the enthronement of this particular deity over the element that is potable.

Bounding to light,
As if from ocean’s cave,
The struggling sea-horse
Paws the lucid wave,
While health and plenty smile,
And Neptune’s form
Majestic sways
The trident of the storm.

The poet is right, as usual, in assigning to the doughty old god the powers that truly belonged to him. But the sculptor has captured Neptune with his trident, dragging him ignominiously from his stormy domain to dry land. Here is a mystery of misapplication not to be looked into too knowingly. It may be that the sculptor (to speak generally, and not censoriously) does not think of water as a beverage, and that therefore he regards the distinction between fresh and salt water as trivial.

The aqueducts of Rome supplied water

primarily to the baths and the public fountains. The wealthy Romans had water-pipes in their homes, but the great mass of the population drew water from the fountains and carried it to their dwellings. Obviously, the fountains had to be large and numerous. As the city waxed in wealth and culture, these fountains were beautified with figures and heads, in imitation of Greek models.

Equally elaborate and much more luxurious were the fountains installed in Roman villas and country houses. In these the water usually fell from above into a large marble basin, and often there was a second fall into a lower receptacle. Fountains of this sort have been uncovered at Pompeii. One of these “is covered with a sort of mosaic consisting of vitrified tesserae of different colors, but in which blue predominates. These are sometimes arranged in not inelegant patterns, and the grand divisions as well as the borders are entirely formed and ornamented with real sea-shells, neither calcined by the heat of the eruption nor changed by the lapse of so many centuries.” Much simpler were the public fountains of Pompeii, numerously placed in the open spaces and at crossways. They had little ornament except a human or animal head from the mouth of which the water issued.

The inclination to dignify water at its sources and at the central points whence it is distributed to a community is a thoroughly natural expression of human nature. It is confined to no particular races, but seeks utterance in every clime and every age. Christianity only intensified this natural feeling. Springs and wells were dedicated to the Blessed Virgin and the saints, and fountains at an early age of our era began to display sacred images. No matter how plentiful water may be, there is an instinctive prejudice against wasting it, and of course it is of paramount importance to preserve the purity of water. Religious sentiment by no means disdains subserving such worthy ends as these, and fountains with sacred names and sacred figures have come down to us from the remote ages of the Christian era. Medieval times flowered in many noble fountains that are still preserved, and the Renaissance, as in all other branches of art, was a rebirth in the designing of fountains. Our modern centuries have elaborated fountain design—too often they have over-elaborated it—but few

critics will allow that modern fountains deserve to be compared with the older examples.

In the United States, nevertheless, there are some splendid fountains, most of them owing their existence to the special architectural inspirations that created this, that, or the other World's Fair. They are, happily, a far cry from the ugly old town pump of earlier American history.

In California, fountain architecture and sculpture stem most noticeably from the fountains of Spain and Mexico. The first influences were exerted by Padre Junípero Serra and his band of Franciscans, who raised in some of the Mission gardens fountains that served to remind them in moments of loneliness of the calm monastic cloisters they had left in far-away Spain.

No modern artist, in all probability, has written as wisely and beautifully about water as John Ruskin. Again and again he treats the theme in book and lecture. Where may one hope to match a passage like this:

"That you may fill your cup with pure water, you must go to the well or spring; you need a fence round the well; you need some tube or trough, or other means of confining the stream at the spring. For the conveyance of the current to any distance you must build either enclosed or open aqueducts; and in the hot square of the city where you set it free, you find it good for health and pleasantness to let it leap into a fountain.

"On these several needs you have a school of sculpture founded; in the decoration of the walls of wells in level countries, and of the sources of springs in mountainous ones, and chiefly of all, where the women of household or market meet at the city fountain.

"There is, however, a further reason for the use of art here than in any other material service, so far as we may, by art, express our reverence and thankfulness. Whenever a nation is in its right mind, it always has a deep sense of divinity in the gift of rain from heaven, filling its heart with food and gladness; and all the more when that gift becomes gentle and perennial in the flowing of springs.

"It literally is not possible that any fruitful power of the Muses should be put forth upon a people which disdains their Helicon; still less is it possible that any Christian

nation should grow up 'tanquam lignum quod plantatum est secus decursus aquarum' (like a tree planted by the rivers of water), which cannot recognize the lesson meant in their being told of the places where Rebekah was met; where Rachel,—where Zipporah,—and she who was asked for water under Mount Gerizim by a Stranger, weary, who had nothing to draw with.

"And truly, when our mountain springs are set apart in vale or craggy glen, a glade of wood green through the drought of summer, far from cities, then it is best to let them stay in their own happy peace; but if near towns, and liable therefore to be defiled by common usage, we could not use the loveliest art more worthily than by sheltering the spring and its first pools with precious marbles."

Ruskin returns to the sweet reasonableness of lavishing the highest art upon fountains in this delightful paragraph, drawn from another essay:

"There is no subject of street ornament so wisely chosen as the fountain, where it is a fountain of use; for it is just there that perhaps the happiest pause takes place in the labour of the day, when the pitcher is rested on the edge of it, and the breath of the bearer is drawn deeply, and the hair swept from the forehead, and the uprightness of the form declined against the marble ledge, and the sound of the kind word or light laugh mixes with the trickle of the falling water, heard shriller and shriller as the pitcher fills. What pause is so sweet as that—so full of the depth of ancient days, so softened with the calm of pastoral solitude."

"She who was asked for water by a Stranger, weary, who had nothing to draw with"—

Did not Ruskin here, unerringly, put deserved emphasis on the most beautiful of all fountain stories? There are many notable wells and fountains in the Old Testament, and their associations are symbolical as well as historic. But the symbolism of water is plumbed to its deepest depth in this New Testament story of her "who was asked for water by a Stranger."

The story is told by the Evangelist John in his tenderest vein, and it seems eminently fitting to quote it here, thus dignifying these pages devoted in all sincerity to the honor of water:

HE left Judea, and went again into Galilee.

And he was of necessity to pass through Samaria.

He cometh therefore to a city of Samaria, which is called Sichar, near the land which Jacob gave to his son Joseph.

Now Jacob's well was there. Jesus therefore being wearied with his journey, sat thus on the well. It was about the sixth hour.

There cometh a woman of Samaria, to draw water. Jesus saith to her: Give me to drink.

For his disciples were gone into the city to buy meats.

Then that Samaritan woman saith to him: How dost thou, being a Jew, ask of me to drink, who am a Samaritan woman? For the Jews do not communicate with the Samaritans.

Jesus answered and said to her: If thou didst know the gift of God, and who he is that saith to thee, Give me to drink; thou perhaps would have asked of him, and he would have given you living water.

The woman saith to him: Sir, thou hast nothing wherein to draw, and the well is deep; from whence then hast thou living water?

Art thou greater than our father Jacob, who gave us the well, and drank thereof himself, and his children, and his cattle?

Jesus answered, and said to her: Whosoever drinketh of this water, shall thirst again, but he that shall drink of the water that I will give him, shall not thirst for ever:

But the water that I will give him, shall become in him a fountain of water, springing up into life everlasting.

The woman saith to him: Sir, give me this water, that I may not thirst, nor come hither to draw.

Jesus saith to her: Go, call thy husband, and come hither.

The woman answered, and said: I have no husband. Jesus said to her: Thou hast said well, I have no husband:

For thou hast had five husbands: and he whom thou now hast, is not thy husband. This thou hast said truly.

The woman saith to him: Sir, I perceive that thou art a prophet.

.

And immediately his disciples came; and they wondered that he talked with the woman. Yet no man said: What seekest thou? or, why talkest thou with her?

The woman therefore left her waterpot, and went her way into the city, and saith to the men there:

Come, and see a man who has told me all things whatsoever I have done. Is not he the Christ?

They went therefore out of the city, and came unto him.

.

Now of that city many of the Samaritans believed in him, for the word of the woman giving testimony: He told me all things whatsoever I have done.

So when the Samaritans were come to him, they desired that he would tarry there. And he abode there two days.

And many more believed in him because of his own word.

And they said to the woman: We now believe, not for thy saying: for we ourselves heard him, and know that this is indeed the Saviour of the world.

Now after two days, he departed thence, and went into Galilee.

For Jesus himself gave testimony that a prophet hath no honor in his own country.

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HE FOUNTAIN OF
JACOB SHALL BE
UPON A LAND OF
CORN AND WINE ,
ALSO HIS HEAVENS
SHALL DROP

DOWN DEW , , HAPPY ART THOU ,
O ISRAEL , ,

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Water

LYMPHA OPTIMA





STILL WATERS: it has the inward music that lies in certain words . . . amber, ivory, foam, silence, dreams; that lies often in some marriage of words . . . moonlight at sea, wind in dark woods, dewy pastures, old sorrowful things; that dwells in some names of things, as chrysoprase; or in some combination of natural terms and associations, as wind and wave; or in some names of women and dreams, Ruth, Alaciel, Imogen, Helen, Cleopatra; or in the words that serve in the courts of music . . . cadence, song, threnody, epithalamion, viol, flute, prelude, fugue. One can often evade the heavy airs of the hours of weariness by the spell of one of these wooers of dreams. **FOAM**—and the hour is gathered up like mist, and we are amid “perilous seas in faëry lands forlorn”: **WIND**—and the noises of the town are like the humming of wild bees in old woods, and one is under ancient boughs, listening, or standing solitary in the dusk by a forlorn shore with a tempestuous sea filling the darkness with whispers and confused rumours and incommunicable things: **RUTH**—and sorrow and exile are become loveliness: **HELEN**—and that immemorial desire is become **OUR** desire, and that phantom beauty is become **OUR** dream and **OUR** passion. **STILL WATERS**—surely through that gate the mind may slip away from the tedious and unwelcome, and be alone among forests where the birch leans and dreams into an amber-brown pool, or by a mountain-lake where small white clouds lie like sleeping birds, or on moonlit lagoons where the reed and the reed’s image are as one, and the long mirrors are unshaken by any wandering air, unvisited but by the passing
soundless shadows of travel-
ling wings.

WILLIAM SHARP (Fiona Macleod)

SAN FRANCISCO WATER

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SAN FRANCISCO, CALIFORNIA

VOLUME VI

OCTOBER, 1927

NUMBER 4

1921-1927: A Report of Progress

By the Editor

I

THE history of Spring Valley Water Company during the past six years provides an excellent illustration of the substantial progress that can be accomplished by a public utility when public authority gives it full measure of co-operation in the solution of pressing problems.

In order to meet its service obligations, a public utility must always strive to maintain a relationship of understanding with those public bodies which are charged with the duty of overseeing its operations and its finances.

Public-utility success depends upon good-will, and good-will is essentially mutual or it is nothing. This mutuality of good-will must be cultivated not only between the utility and the public which makes up the utility's customers, but also between the utility and those official bodies to which all its activities are an open book.

In California the chief of these bodies is the Railroad Commission, which corresponds to the Public Utilities Commission in other states.

The present seems a fitting time to review the activities of Spring Valley Water Company during the past half-dozen years, with a view to estimating how much these activities have benefited San Francisco, and with the further purpose of indicating how important official co-operation has been in making possible the results that have been achieved.

II

In order to understand what Spring Valley Water Company has been able to accom-

plish for the development of San Francisco's water supply during the period between 1921 and the present day, a few words must be said about previous happenings.

In the year 1917 Spring Valley filed with the Railroad Commission an application for a needed increase in rates. The evidence presented to the Federal Court in the 1907-1914 rate case was filed with the Commission as part of the evidence of the new application. This showing was largely supplemented by additional testimony of many authoritative witnesses.

In the latter part of 1919, with the certain knowledge that a substantial rate increase was inevitable, the City sought a suspension of the rate case before the Commission pending a campaign for the purchase of Spring Valley.

The Company agreed to co-operate with the City in this matter, and the Commission on its part agreed, at the request of the City, to determine the fair value of the properties for purposes of sale. The election of March, 1921, though it carried by a large majority, failed of the necessary two-thirds vote, and it was incumbent upon Spring Valley to continue the administration of the San Francisco water supply.

Since the case was originally filed with the Commission in 1917, San Francisco had grown rapidly in population and industrial requirements. The intervening years had been a period of sparse rainfall. As the consumption grew, the reservoir storage became depleted. Without additional rates the credit of the Company would not afford the large investment entailed in the construction of a

pipe-line from the Calaveras Reservoir to bring additional water into service.

Coincident with these conditions of growing demand, depleted sources, and inadequate credit, the construction by the City of the Hetch Hetchy system was proceeding. Hetch Hetchy, however, could not be completed for a period of years, so Hetch Hetchy could not be looked to for immediate solution of the City's water problem.

This is the situation that confronted the City, the Water Company, and the Railroad Commission after the failure of the purchase election in 1921.

III

In these circumstances the Railroad Commission handed down in August, 1921, a decision which, with later modifications, has ever since controlled water-supply conditions in San Francisco. The decision granted Spring Valley Water Company an increase in water rates, and laid down a program for the City and the Company to follow. The outstanding features of this program were as follows:

First: It was stipulated that the City and County of San Francisco should construct the Bay Division of the Hetch Hetchy conduit between Niles in Alameda County and the Crystal Springs Reservoir in San Mateo County, and should make an arrangement with the Water Company whereby the latter would have the use of this conduit to convey water from the Alameda sources to Crystal Springs. The Water Company on its part was required to increase the height of Calaveras Dam sufficiently to produce an additional water supply of twenty-four million gallons daily, and to make such other changes in its structures as might be required to deliver this additional water to a new reservoir at Niles.

Second: The Water Company was required to pay annually to the City five per cent of the cost of constructing the Bay Division of the Hetch Hetchy conduit, these payments not to exceed \$250,000 a year, and to pay all costs of operation and maintenance of the conduit, with the exception of replacements, extraordinary repairs, or damage due to faulty construction.

Third: Commencing with the year 1922, Spring Valley was to establish out of its surplus a fund for amortizing capital ex-

penditures required of it, this fund to be created as follows: After payment of all operating and maintenance expenses, including those for the Hetch Hetchy conduit and pumping station, the payment of taxes and assessments, the creation of an annual depreciation reserve of \$300,000, the payment of bond interest, etc., and the payment of dividends, there was to be set aside out of surplus every year for ten years the sum of \$119,240, with interest at five per cent compounded annually. Should the surplus in any year be in excess of the above requirements, such surplus was to be divided equally between the amortization fund and the corporate surplus of the Company.

Fourth: In the event that the properties of Spring Valley should be purchased by the City prior to January 1, 1932, at the basic price fixed by the Railroad Commission, and accepted by the City and the Company, the City was to take the amortization fund, including the contributions from surplus. But if the City's option to purchase should not be exercised by January 1, 1932, the fund was to remain the property of the Water Company.

IV

In its decision the Railroad Commission addressed itself directly to practical conditions that could not be ignored. The decision represented a workable solution for the future water supply of San Francisco. It took for granted an attitude of co-operation between the City and the Company. The City and the Company entered upon the negotiations contemplated by the Commission. But the City found itself confronted with difficulties in the execution of the agreement that the Commission could not have foreseen. These difficulties proved to be of a substantial character. They were:

First: The construction of a conduit from Niles to Irvington.

Second: The payment of interest on the Hetch Hetchy bonds during the construction of the City's conduit.

While the Company was not in any way obligated under the specific expressions of the Commission's decision to assume these liabilities, it naturally felt itself obligated to approach the problem in that spirit of co-operation upon which the decision of the Commission was based. The water supply of



From this gate-house the release of Calaveras water is controlled. The entrance is pictured on the cover of this issue. The Latin inscription "Lympha Optima" proclaims that "Water Is Best"

the City was at stake; therefore, the future of the Company, as well as of the City, was at stake also.

The Company yielded to the representations of the City and agreed to assume the cost of the Niles-Irvington pipe-line and to pay interest on the Hetch Hetchy bonds during the time of construction of the City's conduit.

The City in turn agreed to continue the life of the arrangement for twelve years instead of ten, a modification which would enable the Company to reimburse itself in the later years of the agreement for the large additional outlays imposed on it by the City during the first years.

These modifications were embodied in a supplemental order made by the Railroad Commission in April of 1922.

V

A third supplemental order in February, 1925, provided that if the annual depreciation fund of \$300,000, which had to be either invested in the property or held in trust in order to maintain the value of the property, proved insufficient to supply adequate funds for new construction, then the

Company, the City Engineer approving, could use such money as might be in the amortization fund over and above the fixed annual contribution, for the purpose of making capital expenditures. In the event that the City exercised its option to purchase Spring Valley, these capital expenditures were not to be added to the purchase price.

Thus the Railroad Commission found for the City and the Company a common ground of understanding which assured adequate development and ample additional water supply for a period of twelve years at least.

This arrangement has permitted Spring Valley to develop the supply progressively and logically during the six years that have passed—just one-half of the option period.

It was only owing to an acceleration in City growth, and a consequent demand for more water that could not possibly have been foreseen, that further recourse had to be made to the Commission this year.

VI

The City and the Company proceeded with energy to carry out the program of development laid down by the Railroad Commission in August, 1921.

First in importance among the obligations assumed by Spring Valley was the raising of Calaveras Dam from an elevation of 680 to an elevation of 775 feet. This provided a storage capacity of 32,800 million gallons of water, just about equal to the storage capacity of all the Peninsula reservoirs combined. Calaveras impounds the run-off from one hundred square miles of watershed, and when the reservoir is full the area of the water surface will be over fourteen hundred acres. The daily productivity at present is 38,200,000 gallons.

The raising of Calaveras Dam, with the consequent increase of storage capacity, was completed in 1925.

At the same time Spring Valley replaced the old Sunol Aqueduct, which traversed Niles Canyon from Sunol to Niles, with a new aqueduct of greatly increased capacity. The old aqueduct consisted of 14,600 feet of concrete-lined tunnel, having a carrying capacity of seventy million gallons daily, and 11,300 feet of redwood flume with a capacity of twenty-one million gallons daily. The wooden-flume section was now replaced by an aqueduct of [*Continued on page 13*]



Cuddled in a fold of the hills near the town of Niles, this reservoir, dug deep in the cool clay, receives water from the Sunol-Niles Aqueduct and releases it for the journey to Irvington, where it enters the Bay Division of the Hetch Hetchy Conduit and crosses the Bay to Crystal Springs



On this steel bridge constructed by the City of San Francisco the Bay Division of the Hetch Hetchy Conduit emerges from the Bay at Ravenswood in San Mateo County, paralleling the emergence of Spring Valley's own conduit. Through this Hetch Hetchy line Spring Valley water flows to Crystal Springs

Embosomed in the hills where the counties of Alameda and Santa Clara meet, Calaveras Reservoir takes toll of a widespread domain rich in flowing waters. A huge barrier flung across a narrow gorge imprisons here the swollen streams of winter, subduing them to the service of San Francisco's water supply.



At this lovely spot on Alameda Creek, immediately above Sunol Dam, all the water from the Alameda Division of Spring Valley Water Company—from Calaveras, from the Sunol gravels, and from the artesian wells of Livermore Valley—is measured by the delicate instruments of hydraulic engineers.

*The moving waters at their priestlike task
Of pure ablution round earth's human shores,
Or gazing on the new soft-fallen mask
Of snow upon the mountains and the moors.*

—KEATS



THE CALAVERAS RESERVOIR



QUEEN OF SPRING VALLEY LAKES



QUEEN OF SPRING VA

*In old tradition transmitted by the first mission-
aries makes the region of Calaveras Reservoir an
ancient hunting-ground and battle-field of Indian
tribes. In the pastoral days of Latin occupation,
herds grazed lazily under the sun that shines today
on a great reservoir dedicated to metropolitan
health and prosperity.*

*Where stalked the huge deer to his shaggy lair
Through paths and alleys roofed with darkest green,
Thousands of years before the silent air
Was pierced by whizzing shaft of hunter keen!*

—WORDSWORTH



Emerging and disappearing as it threads the winding gorge of Niles Canyon, a great white aqueduct that can carry seventy million gallons of water a day reminds us that, while utility is paramount, structural beauty is not necessarily ignored by those who build for the public weal

SAN FRANCISCO WATER

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EDWARD F. O'DAY, Editor

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W. E. CREED: IN TRIBUTE

IN the passing of Wiggington E. Creed the West lost a great builder. Born and raised in California in a period when the state, because of its great resources and great advances in population, was calling for men of strength, character, and vision to take leadership, Creed came forward as an inspiring leader.

First, in the practice of law, he chose those opportunities that were constructive, and by his accomplishments rose to the forefront of the profession. His great feeling for forward accomplishments brought him into the public-utility field. Here, with fine courage and character, he was always, on the one hand, the exponent of expanding and improving service to the public, and, on the other, fearless in commanding respect and fair treatment for the utility. Winning in these principles, he early became a national figure.

His ambition in building the West took on ever larger fields, and he became the founder of the iron and steel industry in the Pacific Coast states. In bringing into a working unit vast iron and coal mines in the Rocky Mountains, blast furnaces for the reduction of these metals, and great plants along the Pacific Coast for the fabrication of steel products, Creed pioneered a great industry destined to build the West, and to serve it in cases of emergency as one of its greatest allies.

He had a rare gift of friendship, and it was a privilege to know him as a friend, but through the brilliance of his career nothing stands out in greater distinction and simplicity than his unexcelled example as the head of an American home.

S. P. EASTMAN

A Report of Progress

[Continued from page 3] reinforced concrete with a carrying capacity equal to that of the original tunnels—namely, seventy million gallons daily. This project, which more than met the Company's obligation of bringing an additional twenty-four million gallons daily from its Alameda sources, was completed in September, 1923.

At the end of this new Sunol Aqueduct, Spring Valley constructed the Niles Reservoir with a capacity of five million gallons. This structure was completed in 1925. From this reservoir to the neighborhood of the town of Irvington, where the Bay Division of the Hetch Hetchy line begins, Spring Valley constructed a steel pipe-line forty-four inches in diameter, completing this element of the new transmission facilities at the same time as the Niles Reservoir.

VII

Meantime the City of San Francisco, under the able direction of its City Engineer, M. M. O'Shaughnessy, proceeded to build the Bay Division of the Hetch Hetchy conduit. This big line, sixty inches in diameter, started at Irvington, entered San Francisco Bay as a forty-inch submarine line near Newark, emerged again as a sixty-inch line upon a steel bridge at Ravenswood, and continued thence toward the west, reaching Crystal Springs Reservoir through the Pulgas Tunnel. Pumping facilities of thirty-four million gallons daily were installed at Ravenswood. Wherever necessary Spring Valley Water Company gave the City, without charge, a right of way for this Hetch Hetchy line.

The last link in this Bay Division of the Hetch Hetchy conduit was completed in May, 1926, and it was immediately turned over to Spring Valley Water Company for use, the Company having already completed its work on the Calaveras Reservoir, the Niles Aqueduct, the Niles Reservoir, and the pipe-line from Niles to Irvington. Thereupon water from the Calaveras Reservoir began flowing through the Spring Valley and City units, thus linked together, into Crystal Springs Reservoir, and has been so flowing ever since.

VIII

To increase the supply and improve the serv-



The Hetch Hetchy line to Crystal Springs Reservoir tunnels the hills west of Redwood City, and the water, hidden from the light of day during all its long journey from Sunol, finally comes out of the Pulgas Tunnel to flow thus for a brief space before plunging into Crystal Springs Lake

ice in San Francisco, Spring Valley Water Company, within the same period, executed several projects of the first importance.

Having purchased a parcel of land on the northeast slope of Mt. Davidson, the Company constructed there the Stanford Heights Reservoir with a capacity of five million gallons. The plans were so drawn that the reservoir could be doubled in size when the need arose. This foresight has been more than justified, for the need of doubling the capacity of Stanford Heights has come much earlier than was anticipated. Plans to this end are in the preliminary stage right now.

Stanford Heights Reservoir supplies that part of the City formerly served from the distributing units of Clarendon Heights and Forest Hill. These sections are now served from the new reservoir by a twenty-four-inch riveted steel pipe two miles long. This work was completed early in 1924.

The Stanford Heights development in-

creased and improved the service in fast-growing residential sections. The commercial districts of the City were also expanding with unusual rapidity, and their water service called for betterment. These districts are served more particularly from the University Mound distributing reservoir. It was found that the banks of this reservoir could be raised six feet, thereby increasing its storage capacity by about seventeen million gallons. When this work was completed the reservoir had a total capacity of fifty-nine million gallons of water.

In 1926 Spring Valley installed a new pipe-line from the Laguna Honda distributing reservoir across Golden Gate Park to the northern side of the City. The importance of this line will be understood from the statement that it has improved water service for forty per cent of the consumers, domestic, commercial, and industrial.

A more recent improvement in the City

system was the building of a new tank at an elevation of 800 feet on Forest Hill, with a capacity of 400,000 gallons. This solves the acute problem of service in the highest section of our hilly city.

Extension and enlargement of the City pipe system has proceeded continuously from August, 1921, to the present day. During these six years the Company has laid new pipes in the distributing system totaling 115.3 miles in length.

The pressing necessity for this work may be gauged from the striking fact that between August 31, 1921, and August 31, 1927, a total of 25,967 active water-service connections has been added to the system in San Francisco. Obviously, San Francisco has been growing very fast during these six years.

Today Spring Valley has developed sixty-six million gallons of water—by no means the full potentialities of the Spring Valley system, but an abundance for present needs.

The protracted dry spell that happily came to an end during the rainy season of 1926 and 1927 caused the Company great anxiety, and the depleted storage at the water sources was supplemented by an emergency development of the Pleasanton artesian supply. During the long drought the Company constructed and equipped thirty new wells and rehabilitated eighteen more. This afforded an important measure of relief.

When the dry spell was definitely broken, reservoir replenishment, both at Calaveras and on the San Mateo Peninsula, came with a rush. There were times during the last rainy season when Spring Valley reservoirs impounded as high as a billion gallons of water during twenty-four hours of down-pour. When the rains were over the depleted reservoirs showed a total holding of more than thirty billion gallons of water.

IX

Spring Valley's record of achievement during the past six years is surely substantial. The Company has carried on its work of administering the water supply of a great city under difficulties that are admittedly great. Had not those public officers who oversee all public-utility activities in California decided, as they did in 1921, that Spring Valley Water Company was entitled

to an increase in rates, the program of construction and betterment would have been simply impossible.

It is relevant to state here that during the War period practically every public utility in the State of California received a needed increase in rates, with one notable exception. That exception was Spring Valley Water Company, which operated until late in 1921 on a schedule of rates that had been put into effect seven years before. The Railroad Commission granted this long-deferred rate increase because it was necessary and just. Certain conditions were attached, and the Company, as has been seen, consistently and scrupulously carried them out. But the rate increase was granted primarily because water rates in San Francisco had been inadequate for a long time.

X

The increase in rates granted in 1921 became a matter of critical study in 1927. It is probable that a certain amount of confusion had arisen regarding the basis on which the rate increase had been grounded. The matter became acute when Spring Valley Water Company, exercising due vigilance on behalf of the water supply, pressed for permission to execute another project of the most urgent necessity.

In the plans which this Company had drawn more than six years ago with administrative and engineering foresight, a large new pipe-line from San Andres Reservoir in San Mateo County was included. At that time this pipe-line was not considered by public authority to be urgently necessary, and the project was not authorized when the big program of Calaveras and related developments was started on its way.

When the time came for Spring Valley to press for the immediate execution of this project, a temporary delay was caused by the fact that the City sought once more to purchase the Spring Valley properties. The election to authorize the necessary bond issue once more failed of a two-thirds majority. Thereupon the Company impressed upon the authorities the urgency of starting the new San Andres program.

Water consumption in San Francisco has increased in the last two or three years at an accelerated rate that could not have been foreseen six or eight years ago. There have

been days during the past summer season when the consumption of water in the City has exceeded the maximum amount of water that Spring Valley can bring into the City in a given twenty-four hours.

Spring Valley's pipe-lines from the San Mateo division and Lake Merced can supply fifty million gallons daily to the distributing reservoirs, and no more. The imperative necessity of providing a new pipe-line from San Andres was formulated by the Company in proceedings that began in the Board of Supervisors, and were later carried on before the Railroad Commission.

In September of 1927 the Company was authorized by the Railroad Commission to build the San Andres line and to make certain important improvements in the distributing system which are bound to be reflected in improved service over a great part of San Francisco. The new San Andres line will be fifty-four inches in diameter, and will make it possible for Spring Valley to increase its water deliveries to San Francisco by thirty million gallons every day, raising daily deliveries from fifty to eighty million gallons. Construction of this line began immediately after it was authorized, the schedule of intensive work calling for its completion before the hot season of next year.

The Company was also authorized to double the capacity of the Stanford Heights distributing reservoir and to make other improvements in its pumping and distributing system. As pointed out already, wise foresight was shown in designing Stanford Heights Reservoir, so that the work of increasing its capacity from five to ten million gallons is much simpler than it would be otherwise.

The problem that had to be solved preliminary to the authorization of this new program was that of financing the necessary capital expenditures within the limitations imposed by the option agreement between the City and the Company. That confusion of mind to which reference has been made led some authorities to believe that the full purpose of the rate increase of 1921 had been accomplished and that rates should be restored to their former level. Study of the Railroad Commission's order of 1921, and the supplemental orders that followed later, does not uphold this contention. Nor could the San Andres project and its allied im-

provements have been initiated under a reduced schedule of rates. A readjustment in the amortization fund solved the problem, the division on a fifty-fifty basis already explained being changed so that two-thirds instead of one-half will henceforward be devoted to these new capital expenditures.

This latest decision of the Railroad Commission marks a forward step of the highest importance in the development of the water supply, and gives further evidence of the Railroad Commission's desire to co-operate in the solution of our difficult water problems. The urgent necessity of an immediate start on the new construction program was recognized; a real emergency was met with promptitude. The result will be to promote the growth and prosperity of San Francisco by making it possible for Spring Valley to bring in from outside sources that additional water without which progress would be impossible.

Montara Hills

By W. A. Brewer, Jr.

[These stanzas breathe the atmosphere of Spring Valley's San Mateo County watershed. They were first published in the *San Francisco Bulletin*, April 4, 1925.]

WHEN I am done with city streets,
And canyons walled with brick-built
towers,

I'll find Montara's still retreats
Among the redwoods and the flowers;
When I am satiate with new,
I'll go and seek the old, old thrills
That wait all those who wander through
The sleepy, blue Montara Hills!

The redwood armies mount the slope,
Knee-deep in tangled underbrush;
Above dark lakes where fishes grope
To where the span-wide rivers rush;
The drunken bees go blundering by
Blue cups that fragrant honey fills;
You long for these? Then why not try
The sleepy, blue Montara Hills?

Unwaked by gasoline or steam,
Untroubled by the siren's shrieks,
They still prolong the ancient dream
They dreamed when Spaniards trod their
peaks;

To those forespent with cash and change,
But one retreat their hope fulfills;
The old, unwaking redwood range—
The sleepy, blue Montara Hills!

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RINK
WATERS
OUT OF
THINE OWN
CISTERN

AND RUNNING WATERS
OUT OF THINE OWN
WELL

SAN FRANCISCO Water



OZYMANDIAS OF EGYPT

*I met a traveller from an antique land
Who said: Two vast and trunkless legs of stone
Stand in the desert. Near them on the sand
Half sunk, a shatter'd visage lies, whose frown
And wrinkled lip and sneer of cold command
Tell that its sculptor well those passions read
Which yet survive, stamp'd on these lifeless things,
The hand that mock'd them and the heart that fed;
And on the pedestal these words appear:
'My name is Ozymandias, king of kings:
Look on my works, ye Mighty, and despair!
Nothing beside remains. Round the decay
Of that colossal wreck, boundless and bare,
The lone and level sands stretch far away.*

— SHELLEY

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Father Nile

By the Editor

A RECENT number of SAN FRANCISCO WATER that was devoted to fountains of world-wide fame bore upon its cover a picture of the magnificent fifteenth-century well-head designed by John of Bologna for the courtyard of the Bevilacqua Palace in his native city. In this great work of art a column supports a lion from whose mouth issues a thin stream of water. The picture elicited a pleasant letter from the scholarly Frank P. Deering, of San Francisco, wherein was the following interesting paragraph:

"Do you know why you so often see water gushing from the mouths of lions at fountains? The original is in Egypt. That country, as you know, depends for its water supply on the Nile. The annual overflow, more or less, of that river refreshing the soil, determines the prosperity of the farmers. The river rises and overflows when the constellation 'Leo' is at its height, and the superstitious inhabitants think that it is from the Lion's mouth that the abundance of the river comes."

The lion's mouth, for fountain use, is world-wide. It is found in the excavated streets of Pompeii and in the very modern gardens of San Francisco. The explanation of its use, so kindly set forth by Mr. Deering, adds an item, small but significant, to the tremendous number of symbols that sprang in the remote past from Egypt and the Nile and that have permeated our civilization.

Thinking of the Nile, one is almost overwhelmed by its importance in the annals of all races. It seems to flow, not merely through Egypt, but through our very consciousness. Great main streams of history are mingled

with its waters. For all the thousands of years of which we have written or sculptured records it has exerted its profound influence upon mankind. The Nile is Egypt, and Egypt is the Nile. It is the Father of Waters, and its patriarchal sway is inextricably woven with the divine as well as the human impulses that have shaped the destiny of the world.

The great Pharaohs who in their extraordinary dynastic pride made the valley of the Nile a wonderland of temples, palaces, and tombs, of pyramids and sphinxes, do not immediately touch our modern lives, however powerfully they affect our imaginations; but think of all the other great men who tarried by this river in the execution of projects which set history in the grooves from which it has not yet deviated! Joseph, Moses, Alexander the Great, Julius Cæsar, Antony, Augustus Cæsar, the great Mohammedan Caliphs, Napoleon—these are but a few of the famous who gazed at one time or another upon the broad bosom of the Nile and left the world different from what they found it. And in the recital of epochal events let us not forget that Flight into Egypt that saved the Child Jesus from the murderous wrath of Herod.

Considered as a water supply, surely the Nile may be placed in foremost position. "Qui aquam Nili bibit, rursus bibet" is the ancient saying that is inscribed today on Shepherd's Hotel in Cairo. The Moslems have borrowed the thought, for they say: "He who has once tasted the water of the Nile, longs for it inexpressibly forevermore." This, of course, is a good deal more than a



"Father Nile," a Vatican masterpiece

tribute to the taste of Nile water; it is a mystical tribute to the fascination that the river exerts upon the mind. Setting aside the marvelous function of irrigation that the Nile has performed since the birth of the world, consider the myriads who have drunk its waters through all the ages. The Nile has a waterway of about four thousand miles, and even the oases of the Sahara Desert are supplied by the infiltration of Nile water. And today, just as happened thousands of years ago, the water-boats ply up and down the river, laden with goatskins full of water to be delivered to the water-carriers at various settlements along the banks. This ever-present condition on the Nile is illustrated on the cover of *SAN FRANCISCO WATER*.

Five hundred years before the beginning of the Christian era, Herodotus, "the father of history," paid a visit to Egypt, and in his fascinating pages there is much evidence of the deep impression that was made upon him by the Nile. "Having heard," he writes in one place, "that all the lands of Greece were watered by rain, and not by rivers, as their own was, they (the Egyptians) said that the Grecians at some time or other would be disappointed in their great expectations, and suffer miserably from famine; meaning that if the deity should not vouchsafe rain to them, but visit them with a long drought, the Greeks must perish by famine, since they had no other recourse for water except from Jupiter only." Let us supplement Herodotus from modern sources.

"The Nile," writes John L. Stoddard, "is the artery of Egypt, upon whose regular pulsations the existence of the land depends. The loam in the Egyptian Delta is that river's sediment, brought in solution from the heart of Africa. Thus Egypt is the gift of Ethiopia.

"Between the fertile valley, thus created and renewed, and the adjoining desert a ceaseless warfare is waged—the old, eternal struggle between Life and Death. To the Egyptians this river represented the creative principle, just as the desert symbolized destruction. In the mythology of Egypt there is a pretty fable, to the effect that the crystal springs of the Nile bubble up in the gardens of Paradise and serve for the ablutions of angels. Thence, wandering through lovely meadows, the infant stream finally expands into this lordly and majestic river, which offers life and plenty to the world.

"Within the arches of the Vatican there now reclines in Oriental calm an ancient statue of old Father Nile, leaning upon a miniature sphinx; while on its shoulders and around its limbs play sixteen pigmies, representing the sixteen cubits of the annual rise of the river. Surely it is not strange that the old Egyptians deified the Nile, to whose life-bringing flood they owed not only their sustenance, but the very soil on which they lived."

To return to Herodotus, we learn from his pages that even the Oracle of Ammon paid testimony to the importance of the Nile. The oracle was appealed to by certain tribes that



Where Antony sailed with Cleopatra

resented being called Egyptians and sought divine support for their exclusiveness. But the Oracle of Ammon declared "that all the country which the Nile irrigated was Egypt, and that all those were Egyptians who dwell below the city Elephantine, and drink of that river."

In some sense this has always been true, even of those who did not "dwell below the city Elephantine." Pythagoras drank of Nile water, and its Egyptian qualities were reflected in his philosophy. Euclid drank, and enriched his mathematical mind with Egyptian subtlety. Plato quaffed, and became a greater Plato. Julius Cæsar and Antony tasted Nile water as well as the heady wine spilled in the palace of Cleopatra. Napoleon drank . . . but so did Nelson.

One cannot think of Egypt without thinking of the Nile. Egypt may be "the eldest born of time," but it is also "the gift of the Nile." Let Frank G. Carpenter take up the story of this wonderful waterway:

"This whole rainless country was once a bed of sterile sand so bleak and bare that not a blade of grass nor a shrub of cactus would grow upon it. This mighty river, rising in the heights of Africa and cutting its way through rocks and hills, has brought down enough sediment to form the tillable area of Egypt.

"South of Cairo, for nearly a thousand miles along its banks, there extends a strip of rich black earth which is only from three to nine miles wide. Below the city the land spreads out in a delta shaped somewhat like the segment of a circle, the radii of which jut out from Cairo, while the blue waters of the Mediterranean edge its arc. This narrow strip and fan form the arable land of Egypt. The soil is nowhere more than thirty-five feet deep. It rests on a bed of sand. On each side of it are vast wastes of sand and rock, with not a spot of green to relieve the ceaseless glare of the sun. The green goes close to the edge of the desert, where it stops as abruptly as though it were cut off by a gardener. Nearly everywhere up the Nile from Cairo the strip is so narrow that you can

stand at one side of the valley and see clear across it.

"Thus in one sense Egypt is the leanest country in the world, but it is the fattest in the quality of the food that nature gives it. Through the ages it has had one big meal every year. At the inundation of the Nile, for several months the waters spread over the land and were allowed to stand there until they dropped the rich, black fertilizing sediment brought down from the African mountains. This sediment has produced from two to three crops a year for Egypt through the centuries and for a long time was the sole manure that the land had. The hundreds of thousands of cattle, donkeys, camels, and sheep that feed off the soil give nothing back to it, for their droppings are gathered up, and dried for use as fuel. Recently the use of artificial fertilizers has been encouraged with excellent results.

"The irrigation of Egypt is now con-



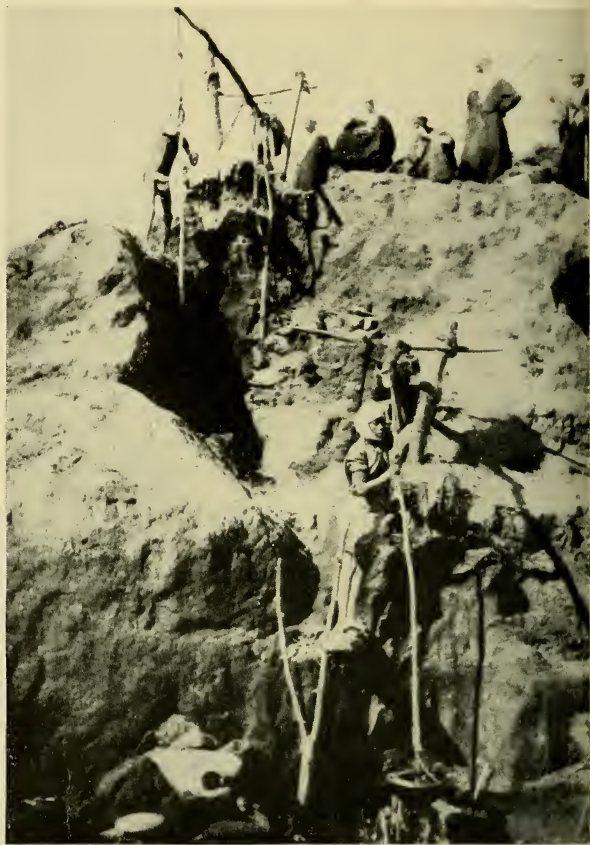
When the sluice-gates of Assouan Dam are closed the Nile partially submerges the beautiful ruins of Philæ

ducted on scientific lines. The water is not allowed to spread over the country as it was years ago, but the arable area is cut up by canals, and there are immense irrigating works in the delta, to manage which during the inundation hundreds of thousands of men are required. Just at the point of the delta, about twelve miles above Cairo, is a great dam, or barrage, that raises the waters of the Nile into a vast canal from which they flow over the fanlike territory of Lower Egypt.

"All through Egypt one sees men scooping the water up in baskets from one level to another, and everywhere he finds the buffalo, the camel, or donkey turning the wheels that operate the crude apparatus for getting the water out of the river and onto the land."

It remained for the engineers of today to harness the Nile, to teach it how to flow, to defeat its weakness (for this mighty river can be weak when its sources are not adequately replenished), and to do away with those alternations of fat years and lean that we have associated with the Nile ever since we first spelled out the immortal story of Joseph and his brethren.

In the heart of the desert, seven hundred miles south of the Mediterranean, at the first cataract of the Nile, is the Assouan Dam that British engineers built to harness the Nile and free Egypt from the possibility of famine.



Nile water is thus lifted to the irrigation ditches

"The volume of the Nile," says Frank G. Carpenter, "is enormous. At flood times, a billion tons of water go by at Assouan every day. The river then rises twenty-five feet at Cairo, thirty-eight at Old Thebes, and almost fifty feet at the first cataract. There is so much water that no dam could hold it, hence all of these great works had to be made so that the water can be let in and out and allowed to pass through at will.

"It is at flood time that the Nile valley gets its rich feed of Abyssinian mud. This is brought down in part by the Blue Nile, but more abundantly by the Atbara, or Black



The carriers set out to bring Nile water to the consumer

Nile. It is carried by the inundation all over Egypt and by means of irrigation conducted to nearly every farm. After the floods subside the muddy waters grow clear again. The Blue Nile and the Black Nile become almost dry, and the white water of the main, or Victoria, Nile is about all that Egypt has. It is this white water that is stored up by the Assouan Dam, and it feeds the country in much the same way as our irrigation canals do, with water only and not with a thick mixture of water and mud as in the times of overflow.

"For thousands of years these rivers have

been pouring down through this Nile valley; but whenever the rains have been scanty in the highlands of Abyssinia and in Central Africa the main stream has not been high enough to reach the whole country. Most of the lands could be inundated only once a year, and if the Nile was especially low some could have no water at all. By the present system Egypt has water all the year round, and enough to make it produce two or three crops every twelve months."

For the engineering features of this great structure our authority is James D. Schuyler, who gives these particulars in his *Reservoirs for Irrigation, Water Power, and Domestic Water Supply*:

"The Assouan Dam . . . creates a reservoir with a capacity of 863,000 acre-feet, its effect extending back up the river a distance of 140

miles, estimating its surface slope at 1:32,000. It will thus cover an area of over 40,000 acres, a large portion of which is not over 1000 feet wide.

"The dam which was begun in 1898 and completed in June, 1902, is of vast proportions, being 6400 feet in length, with a maximum height of 130 feet above the lowest foundations and containing 704,000 cubic yards of masonry.

"The maximum depth of water in the reservoir available for draft is about 60.8 feet at the dam. The elevation of high-water level in the reservoir is 348 feet above mean tide.

"The dam is divided into two sections, one of which extends from the east bank for 1800 feet as a solid masonry wall without openings, while the remaining portion of 4600 feet, containing 180 sluiceways, reaches to the west bank, and includes a navigation lock on that side.

"The sluiceways are designed to carry the entire volume of the river at flood, without permitting the water to reach higher than within 9.8 feet of the top of the dam.

"The width of crest of the eastern solid section is 17.8 feet, while the portion in which the sluiceways are built is 23 feet wide on top, carrying a roadway entirely across the dam.

"The sluiceways are in four levels, 140 of them on the two lower levels, each being seven meters high by two meters wide, while the upper banks of 40 sluices are each two meters wide by 3.5 meters high.

"The total discharging area thus provided, with all sluice-gates open, is 24,100 square feet. The maximum recorded discharge of the river was 494,500 second-feet (1878-79).

"The sluices mostly are in groups of ten, with spaces of five meters of solid masonry between individual sluices, and 10 meters between two adjoining groups, where buttresses 26 feet wide, 3.8 feet thick, are built on each face at intervals of 240 feet.

"The openings or outlets being arranged at varying heights, the reservoir may be drawn from near the top, without excessive head or friction to resist the opening of the gates. Sixty-five of them are placed near the bottom of the dam, with sills 70.7 feet below the floor of the roadway on top, of which forty are lined with plates of cast-iron, 1½ inches thick, having flanges or ribs embedded in the masonry, 12 inches deep, by which the plates are bolted together. Seventy-five sluices are placed at the next higher level, 55.8 feet below the crest, and of these one-third are provided with balanced gates of the Stoney roller type, easily operated under full pressure, if desired. Of the remaining sluices 18 are placed with sills 42.7 feet below the top of the dam, and 22 are 29.7 feet below the roadway level.

"The navigation pass around the dam consists of a canal, partly excavated in rock and partly in embankment with four locks, making a total descent of 68.9 feet. The canal

is 654 feet long, 49.2 feet wide on the base.

"The dam is founded on a ledge of granite of very irregular surface, one narrow channel requiring a maximum height of 130 feet, but the average height is about 82 feet. The base width is about 85 feet. The downstream batter is 1:1.5, while that on the upstream face is 1:1.8.

"The dam consists of rubble masonry laid in 1.4 cement mortar. It was said to be entirely water-tight when completed. The total excavation required was 824,000 cubic yards or double the estimate. This increased the masonry by 45 per cent over what was anticipated, so that the final cost of the dam reached the sum of £2,450,000 (\$11,907,000), or \$13.80 per acre-foot of storage capacity.

"The plans for the dam were prepared originally by Sir William Wilcocks, M. Inst. C. E., and executed by Frederick W. S. Stokes, M. Inst. C. E., and his successor, C. R. May, M. Inst. C. E. Sir Benjamin Baker, M. Inst. C. E., acted as consulting engineer for the Egyptian Government. The contractors were Sir John Aird & Co.

"The original plans first proposed would have raised the water to such a height as would have inundated the ancient temple of Philæ, situated a mile above the dam on an island. Out of deference to public protest against the destruction of this archæological monument, the plans were modified so as to limit the flood level to the floor of the temple. In order to protect the portions of the temple resting on silt a great deal of work in underpinning was performed."

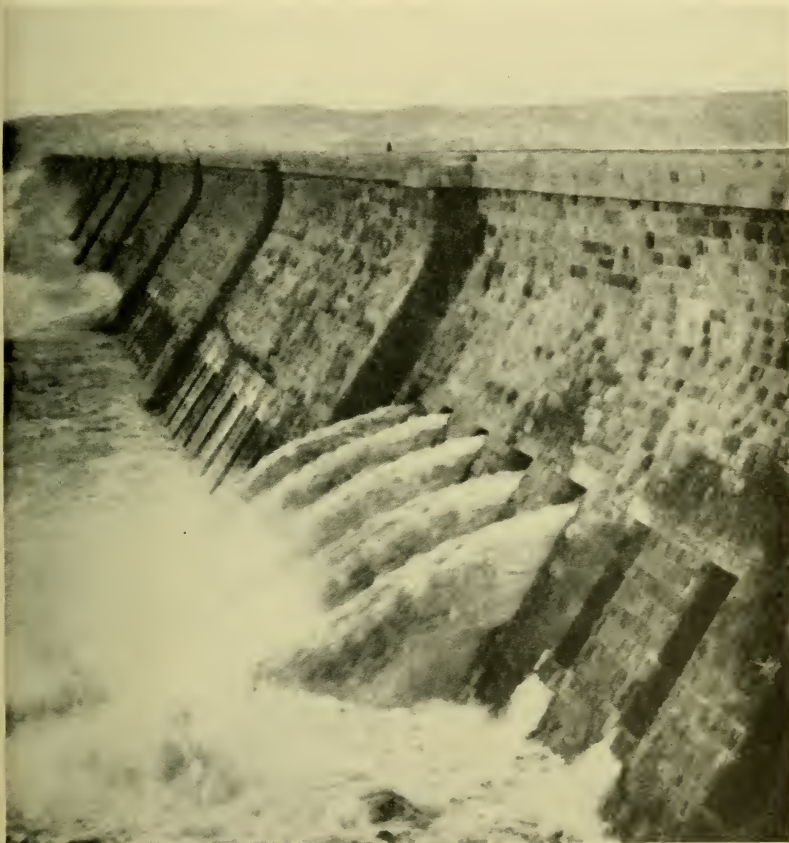
Gauges to register the rise of Nile water are placed at Cairo, Assouan, Berber, and Khar-toum; but these devices, while installed in the best technique of modern science, represent nothing new in the life of Father Nile. The inscriptions carry back the story of the first Nilometer 2500 years before the beginning of the Christian era. And of course it may have antedated the earliest inscription thus far uncovered. The most famous of Nilometers is on the island of Elephantine at Assouan. It was built of hewn stones, marked with scales to record the level of the water. Dating from very ancient Egyptian times, it was improved during the Roman domination, and was repaired in 1870 by the Khedive Ismail. There are other famous Nilometers. One on the quay wall of the

temple of Karnak records forty high Niles in the Twenty-fifth Dynasty.

Does it not seem futile, this attempt to bridle the Nile with words? The Nile was flowing serenely before the first Egyptian monuments—pyramids, temples, Nilometers—were thought of, and it flows just as serenely today past the mockery of Ozymandias and Tut-Ankhamen. The Nile is a universal symbol. "Shall you not feel reverence for the Nile, the mixing bowl of Egypt?" demanded Apollonius of Tyana when the Christian era was new. And when the Em-

peror Vespasian wished to impress upon his doubtful Egyptian subjects the beneficence of his rule, he told them, "You shall draw as liberally upon me as you do upon the Nile."

During the reign of Augustus Caesar, the great geographer Strabo set out upon his travels, note-book ever in hand. Judging from his work, no place that he visited impressed him more than the valley of the Nile. He was, doubtless, as keenly responsive to its allure as Herodotus had been hundreds of years before. But [*Concluded on page 16*]



Assuan Dam controls the Nile by a system of sluice-gates that release water according to the seasonal needs of the farmers; so there are no more "lean years" in Egypt

Two Poems on Water

By Robert Southey

ON the following pages are given two of the most famous English poems ever written on the subject of water, and, strangely enough, both were written by Robert Southey.

"The Well of St. Keyne" was written in 1798; "The Cataract of Lodore" in 1820, when Southey was Poet Laureate. Both were in the nature of *jeux d'esprit*, and Southey did not value them highly. He felt sure that his fame as a poet would be perpetuated by such epic and narrative poems as "Joan of Arc," "Thalaba," and "The Curse of Kehama," not by the simple little effusions that he dashed off for the amusement of his children. It is probable that not more than a dozen living persons have waded through the pretentious poems upon which he staked his claim to immortality. But "The Cataract of Lodore" and "The Well of St. Keyne," together with "Mary, the Maid of the Inn," "The Inchcape Rock," and "The Battle of Blenheim" ("It was a famous victory"), were all in the school readers when those of us who are forty or over were children, and it is safe to say that when we turn again to those well-thumbed old readers, these are among the first pieces that we read.

Robert Southey was born near Bristol, in 1774, and was educated at Westminster School and Oxford. He studied law for a while in London; but literature drew him irresistibly, and eventually he settled at Keswick in the English Lake Country, where he enjoyed the companionship of Wordsworth and Coleridge and where he died in 1843 after having produced an enormous amount of good work in prose and verse.

Like the great bulk of his poetry, his prose is now unread, the exceptions being his lives of Nelson and Wesley. It used to be said of the former biography that it did more to recruit young men for the English Navy than all other influences combined.

When the great McGuffey and his imitators placed "The Cataract of Lodore" in the school readers, they were actuated principally by the thought of supplying children with an exercise in enunciation. Many a youngster came to grief over the poem and was reprimanded by Teacher for slighting

that formidable array of final *g*'s. As for the unfortunate child with an impediment of speech, the poem took on the semblance of a nightmare. But the majority of the pupils in any class were sure to like "Lodore." It was good fun, and some of the strange rhymes invariably provoked merry laughter.

It is worth while noting here that "The Cataract of Lodore" was a lifelong favorite with the late Mayor Edward Robeson Taylor, of San Francisco, who was not only a poet but an omnivorous reader of poetry.

Robert Southey was always delving in ancient and forgotten books. In an old folio of Thomas Fuller's he came across this passage: "I know not whether it be worth the reporting, that there is in Cornwall, near the parish of St. Neots, a well, arched over with the robes of four kinds of trees,—withy, oak, elm, and ash,—dedicated to St. Keyne. The reported virtue of the water is this, that, whether husband or wife come first to drink thereof, they get the mastery thereby."

This naive legend inspired Southey to write "The Well of St. Keyne," but so effective is the original twist he gave to the end of the story that the poem becomes a bit of quite sophisticated humor. Wives are apt to appreciate it more than husbands, provided they admit the right of a poet to joke on so serious a subject as domestic mastery. Husbands usually exhibit a wry face when they come to the last line. Some have wondered privately whether there is not a well of St. Keyne in their own neighborhood, known only to women and revealed to brides by their elders as part of that freemasonry said to flourish among all members of the weaker sex.

But this is treading on dangerous ground. The "St. Keyne," like the "Lodore," is presented here as a celebration of water, not to feed the flames of connubial controversy. It would be unfortunate indeed if water, as such, were permitted to become a subject of contention between husbands and wives. The faucet has not yet descended to the level of the rolling-pin. A Lake Poet like Southey would be shocked if his pleasant little *jeu d'esprit* became a poisoned spring.

The Cataract of Lodore

"How does the Water
Come down at Lodore?"

My little boy asked me

Thus once on a time;

And moreover he tasked me

To tell him in rhyme.

Anon, at the word,

There first came one daughter,

And then came another,

To second and third

The request of their brother,

And to hear how the Water

Comes down at Lodore,

With its rush and its roar,

As many a time

They had seen it before.

So I told them in rhyme,

For of rhymes I had store;

And 'twas in my vocation

For their recreation

That so I should sing,

Because I was Laureate

To them and the King.

From its sources which well

In the Tarn on the fell;

From its fountains

In the mountains,

Its rills and its gills,—

Through moss and through brake

It runs and it creeps

For awhile, till it sleeps

In its own little Lake.

And thence at departing,

Awakening and starting,

It runs through the reeds,

And away it proceeds

Through meadow and glade,

In sun and in shade,

And through the wood-shelter,

Among crags in its flurry,

Helter-skelter,

Hurry-skurry.

Here it comes sparkling,

And there it lies darkling;

Now smoking and frothing

Its tumult and wrath in,

Till, in this rapid race

On which it is bent,

It reaches the place

Of its steep descent.

The Cataract strong

Then plunges along,

Striking and raging,

As if a war waging

Its caverns and rocks among;

Rising and leaping,

Sinking and creeping,

Swelling and sweeping,

Showering and springing,

Flying and flinging,

Writhing and ringing,

Eddying and whisking,

Spouting and frisking,

Turning and twisting,

Around and around

With endless rebound!

Smiting and fighting,

A sight to delight in;

Confounding, astounding,

Dizzying and deafening

the ear with its sound.

*Collecting, projecting,
 Receding and speeding,
 And shocking and rocking,
 And darting and parting,
 And threading and spreading,
 And whizzing and hissing,
 And dripping and skipping,
 And hitting and splitting,
 And shining and twining,
 And rattling and battling,
 And shaking and quaking,
 And pouring and roaring,
 And waving and raving,
 And tossing and crossing,
 And flowing and going,*

*And running and stunning,
 And foaming and roaming,
 And dinning and spinning,
 And dropping and hopping,
 And working and jerking,
 And guggling and struggling,
 And heaving and cleaving,
 And moaning and groaning;

 And glittering and frittering,
 And gathering and feathering,
 And whitening and brightening,
 And quivering and shivering,
 And hurrying and skurrying,
 And thundering and floundering;*

*Dividing and gliding and sliding,
 And falling and brawling and sprawling,
 And driving and riving and striving,
 And sprinkling and twinkling and wrinkling,
 And sounding and bounding and rounding,
 And bubbling and troubling and doubling,
 And grumbling and rumbling and tumbling,
 And clattering and battering and shattering;*

*Retreating and beating and meeting and sheeting,
 Delaying and straying and playing and spraying,
 Advancing and prancing and glancing and dancing,
 Recoiling, turmoiling and toiling and boiling,
 And gleaming and streaming and steaming and beaming,
 And rushing and flushing and brushing and gushing,
 And flapping and rapping and clapping and slapping,
 And curling and whirling and purling and twirling,
 And thumping and plumping and bumping and jumping,
 And dashing and flashing and splashing and clashing;
 And so never ending, but always descending,
 Sounds and motions for ever and ever are blending,
 All at once and all o'er, with a mighty uproar;
 And this way the Water comes down at Lodore.*

The Well of St. Keyne

*A Well there is in the west country,
And a clearer one never was seen;
There is not a wife in the west
country
But has heard of the Well of
St. Keyne,*

*An oak and an elm tree stand beside,
And behind doth an ash-tree grow,
And a willow from the bank above
Droops to the water below.*

*A traveller came to the Well of
St. Keyne;
Joyfully he drew nigh;
For from cock-crow he had been
travelling,
And there was not a cloud in
the sky.*

*He drank of the water so cool and
clear,
For thirsty and hot was he;
And he sat down upon the bank,
Under the willow-tree.*

*There came a man from the house
hard by,
At the Well to fill his pail;
On the Well-side he rested it,
And he bade the Stranger hail.*

*"Now, art thou a bachelor, Stran-
ger?" quoth he;
"For, an if thou hast a wife,
The happiest draught thou hast
drank this day
That ever thou didst in thy life.*

*"Or has thy good woman, if one
thou hast,
Ever here in Cornwall been?"*

*For, an if she have, I'll venture
my life
She has drank of the Well of
St. Keyne."*

*"I have left a good woman who
never was here,"
The Stranger he made reply;
"But that my draught should be
the better for that,
I pray you answer me why."*

*"St. Keyne," quoth the Cornish-
man, "many a time
Drank of this crystal Well;
And, before the angel summoned her,
She laid on the water a spell,—*

*"If the Husband, of this gifted Well
Shall drink before his wife,
A happy man thenceforth is he,
For he shall be Master for life;—*

*"But, if the Wife should drink of
it first,
God help the Husband then!"—
The Stranger stooped to the Well of
St. Keyne,
And drank of the water again.*

*"You drank of the Well, I warrant,
betimes?"
He to the Cornish-man said;
But the Cornish-man smiled as the
Stranger spake,
And sheepishly shook his head:—*

*"I hastened, as soon as the wedding
was done,
And left my Wife in the porch;
But i' faith she had been wiser
than me,
For she took a bottle to church."*

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EDWARD F. O'DAY, Editor

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O. E. CLEMENS

AS the year 1927 drew to a close, every man and woman in the employ of Spring Valley Water Company was saddened by the death of O. E. Clemens, Manager of the Water Sales Department and Office Manager.

Mr. Clemens passed away in this city on November 19, 1927. His illness had been protracted; toward the end the outcome was known to be inevitable; but his death brought a shock to the associates who for nearly ten years had been used to seeing him the picture of health and vigorous activity. It was difficult to apprehend that so vital a personality had gone.

Before joining Spring Valley Water Company, Mr. Clemens had earned a splendid executive reputation under William Mulhol-

land during the construction of the Los Angeles-Owens River Aqueduct.

His task with Spring Valley was to reorganize the Water Sales Department to meet the requirements of a radical change in the Company's relations with domestic consumers. These had been paying for water on a flat-rate basis, and the universal metering of the city, together with the adoption of a new and scientific form of billing, created problems that called for diplomacy, patience, and understanding as well as a special technical skill.

Mr. Clemens proved the ideal man for this undertaking. Upon public authorities, upon consumers in all walks of life, and upon the men and women who worked with him or directly under him, his personality, his ability, his just and kindly attitude made a very deep impression.

But it would be inadequate to appraise O. E. Clemens solely in terms of his work. One does not live, nor is one remembered, by efficiency alone. While the splendid qualities that distinguished a man's workaday hours are recalled as part of his essential character, the human attributes that made that man beloved stand out in strong relief, and are recognized as the mainsprings of all that he did, of all that he meant to his associates. So it was with O. E. Clemens. Himself a man of disciplined ways, he was too fine of understanding not to find common ground with those who needed the helping hand across an unsafe path. His sympathy was a tested and proven trait.

The sentiments of the Board of Directors were expressed in the following resolutions:

WHEREAS, O. E. Clemens, Office Manager and Manager of the Water Sales Department of Spring Valley Water Company, departed this life on the nineteenth day of November, 1927; and

WHEREAS, O. E. Clemens had been in the service of Spring Valley Water Company for ten years; and

WHEREAS, The members of the Board of Directors of Spring Valley Water Company share with all of Mr. Clemens' Spring Valley colleagues a profound sense of sorrow for his untimely passing; now therefore be it

Resolved, That we recognize in O. E. Clemens an executive who served this Company with ability and fidelity; and be it further

Resolved, That this board spread upon the minutes of its meeting these resolutions in memory of O. E. Clemens, inspired by admiration of his character, respect for his ability, and sympathy for his bereaved family.

In the Gay Nineties

THESE views of Clarke's Water Works are dedicated to our greatest living statesman,—the man whose brain conceived the idea of a Pan-American Congress, the man to whom more than to any other single person the republic of Brazil owes her freedom from the invading fleets of foreign despots, the pathfinder of peace, progress and civilization, our honored fellow-citizen, James G. Blaine.

"From the Pacific to the Atlantic sounds the glorious sentiment uttered by Stanley Mathews, 'a government of laws and not of men,' and the Children of Freedom rejoice around their Queen as she marches grandly down the aisles of time, guarded and led by our great statesman."

Dr. A. T. Leonard, Jr., of San Francisco, is an assiduous and learned collector of Californiana, and more particularly of books, pamphlets, and pictures relating to his native city. Not long ago, in one of those unlikely-looking emporia of second-hand furniture that the wise collector never overlooks, Dr. Leonard found an album of curious photographs. The opening page contained the dedication quoted above, and the signature that rounded out the two oratorical paragraphs informed Dr. Leonard that he had stumbled upon what was, perhaps, the sole remaining record of an enterprise known to many San Franciscans "in the gay nineties" as "Nobby Clarke's Water Works." For the dedication was signed by Alfred Clarke. It had been penned on Decoration Day, 1891.

Alfred Clarke, known familiarly as "Nobby," was a man of some means who owned property on the eastern slope of Twin Peaks. He built his home, in the awful architecture of the nineties, at Douglass Street and Casselli Avenue. He built a Twin Peaks water-works system after a quarrel with his neighbor Behrend Joost, who was already in the water business and whose terms of service failed to satisfy the newcomer. More than one water-works system has been so initiated.

Through the kindness of Dr. Leonard some of the pictures recording this forgotten enterprise are reproduced in this issue. The system included the Nellie Dam and the Nellie Reservoir, Lake Lincoln and Lincoln Dam, flumes, the Blaine Pumps and the



Alfred Clarke, with his guests respectfully aloof, proudly surveys his water system

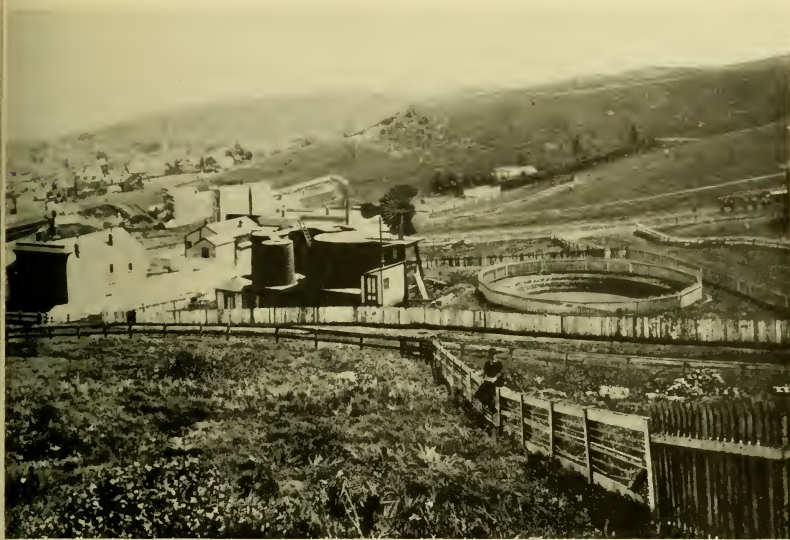
Blaine Tanks. The lakes were scarcely lakes, however, and the dams were extremely primitive affairs. Moreover, it is doubtful whether "the Plumed Knight" would have greatly appreciated the application of his name to such humble installations.

The personnel of this hydraulic project cannot have been large. As for executive direction, it was all concentrated in "Nobby" Clarke. He was president, chief engineer, head of the entertainment committee (for he gave picnics), and doubtless bill-collector.

The Clarke residence still stands in all its horrific architectural pretensions. But of the water works, alas! no vestige remains. They are one with the glory that was Greece and the grandeur that was Rome. The enterprise was blighted at the start because President Harrison, on his visit to San Francisco, refused to preside at the dedicatory ceremonies.



Lake Lincoln of the Clarke water system is shown above, while below is Nellie Dam, with Mr. Clarke acting as host to a picnic party. The Nellie after whom the dam was named may be among those present



The circular structure in the upper picture Mr. Clarke described as "the large brick reservoir."
Below is the Clarke home, at Douglass Street and Caselli Avenue. The hose is being played to demonstrate water pressure

Father Nile

[Continued from page 7] Strabo had more of the scientist in him than "the father of history," and for him the Nile and the Nile country dwarfed the human achievement associated with them. He went to Egypt on the heels of great events, of catastrophes that shook the world and changed the course of civilization. But for Strabo the Nile was so much more important than the human factors of Nilotic history that he was capable of compressing into four prosaic paragraphs one of the greatest romances of all time. Hearken to Strabo:

"Ptolemy, on being restored by Gabinus, put to death both Archelaus and his daughter; but not long after he was reinstated in his kingdom, he died a natural death, leaving two sons and two daughters, the eldest of whom was Cleopatra.

"The Alexandrines declared as sovereigns the eldest son of Cleopatra. But the adherents of the son excited a sedition, and banished Cleopatra, who retired with her sister into Syria.

"It was about this time that Pompey the Great, in his flight from Palae-pharsalus, came to Pelusium and Mount Casium. He was treacherously slain by the king's party. When Cæsar arrived, he put the young prince to death, and sending for Cleopatra from her place of exile, appointed her queen of Egypt, declaring also her surviving brother, who was very young, and herself, joint sovereigns.

"After the death of Cæsar and the battle at Pharsalia, Antony passed over into Asia; he raised Cleopatra to the highest dignity, made her his wife, and had children by her. He was present with her at the battle of Actium, and accompanied her in her flight. Augustus Cæsar pursued them, put an end to their power, and rescued Egypt from misgovernment and revelry."

A facile criticism would say that Strabo was unimaginative, thus coldly to dispose of the epochal situation that enmeshed in the toils of Cleopatra the great Pompey and the triumvir Antony, while profoundly affecting the careers of Julius Cæsar and Augustus.

But it is a facile and a superficial criticism. Strabo saw the Nile as we must view it—he saw it as the sculptor of the Vatican masterpiece interpreted it. To him it was

Father Nile, and he was a little impatient of the human pigmies that wet their destinies in its tremendous flood.

Strabo could count the centuries as well as we. There were antique ruins beside the Nile in his far-off day. In Strabo's time as now, "Round the decay of those colossal wrecks, boundless and bare, the lone and level sands stretched far away."

What to him were Antony and Cleopatra! Just a moment of meaningless revelry in the life of Father Nile.

In April, 1906

IN the last installment General Funston's account of his work as military Commandant at San Francisco was carried as far as the second day of the fire.

At that time the problem of the water supply had become serious; and it was feared that if the supply could not be promptly restored a water famine would ensue, and the health of the refugees be endangered. How the Spring Valley Water Company, and its engineer, the late Mr. Hermann Schussler, rose to the occasion, as well as other matters pertaining to the relief of the refugees, is described in the concluding part of General Funston's account, which follows:

I learned unofficially on the afternoon of the 18th that the Spring Valley Water Company was most energetically repairing its great water mains and that they hoped in a day or two to bring within the city a small amount of water through their regular mains. I was glad to learn on the 20th that my unofficial report was confirmed by the statement of Mr. Schussler, chief engineer of the Spring Valley Water Company, to the effect that he hoped to be able to deliver in the city the next day 10,000,000 gallons of water and thereafter probably that amount each day until, finally, the system would be completely restored. It was most fortunate, indeed that this gentleman was in the city, as he had planned and supervised the construction of all the larger mains and was able to locate them from memory alone, as all the charts had been destroyed in the conflagration. It was from his intimate knowledge, also, that he was able to send mechanics immediately to the various streets from which branch the side lines into the burned district, and thus stop the waste of water, which must inevitably have resulted had these pipes not been closed.

The offices of the Spring Valley Water Company at 126 Stockton Street, between O'Farrell and Geary streets, were destroyed on April 18, and with them all the maps and plans showing the mains and pipes of the entire system. General Funston's eulogy of the late Mr. Schussler was re-echoed from many sources. But for the fact that he carried a mind's-eye plan of the water system under his hat, the plight of San Francisco would have been exacerbated by the lack of water for drinking purposes.—*S.F. Argonaut.*

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“E WHO HAS
ONCE TASTED
THE WATER OF
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INEXPRESSIBLY FOREVERMORE”

070

SAN FRANCISCO Water



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Abundant Water for Civic Prosperity

By T. W. Espy and George W. Pracy

THE Spring Valley Water Company is actively engaged in increasing the capacity of its lines into San Francisco from fifty to eighty million gallons daily. This enlargement by thirty million gallons of the capacity of the Company's major transmission lines is being accomplished by the installation of what is called the new San Andres pipe-line. It takes its name from Lake San Andres, in San Mateo County, whence it will draw water. The new line will terminate in Lake Honda Reservoir, San Francisco. It is some eleven miles long. The San Andres line will be a working part of Spring Valley's big distributing system by summer-time this year.

The new San Andres line may be regarded as a symbol of the steadily accelerated growth which is so important a fact in the present life of San Francisco. In the summer of 1927, during those hot spells when consumption of water reaches the peak, it was brought home to public authority and to citizens in general that Spring Valley's contention as to the uncomfortably small interval between pipe capacity and consumption was exceedingly well taken, and that the situation called for immediate action. In consequence, the building of a new line to widen the margin of safety between pipe capacity and peak consumption was authorized by the Railroad Commission, and Spring Valley lost no time in beginning work.

Engineering studies had already determined the general scheme to be followed. Careful computation had been made of probable future water consumption, both for the city as a whole and for the distributing districts into which the city is divided. The

economic aspect, of course, had not been lost sight of—the aim in the construction of transmission lines must always be to supply water to those who need it at the lowest possible cost that is consistent with safety and efficiency.

Before setting forth in detail the conclusions arrived at as a result of these studies, it will be informing as well as interesting to review briefly the gradual development of Spring Valley Water Company's major conduits.

In the history of Spring Valley the first source of supply was Islais Creek. Water was diverted at a point near the present Mission Street Viaduct, and was piped to a reservoir at Sixteenth and Brannan streets that has long been abandoned, although the curious may trace its outlines by following the cinder path on the grounds of Lick-Wilmerding School.

In 1862 water was brought to San Francisco from the Upper Pilarcitos Dam by means of a wooden flume thirty-two miles long. This flume delivered water to Laguna Honda, which is situated in the hills west of Twin Peaks at an elevation of 370 feet above sea-level. Portions of that old flume, reconstructed and repaired, remained in service through Sutro Forest, on the west side of Mount Davidson, until residential development of that section—the subdivision of St. Francis Wood, etc.—made its replacement by pipes necessary about the year 1918.

The construction of this flume was followed by the dry years of 1863 and 1864. The small reservoir made by the Upper Pilarcitos Dam would have gone dry had not



Looking from the inlet across the waters of San Andres Lake

pumps been quickly installed and water pumped from San Pedro Valley, near Salada Beach, over the mountains into Pilarcitos Reservoir.

In 1865 Spring Valley purchased all the property and franchises of the San Francisco City Water Works, which had been incorporated just one year before Spring Valley. This senior company possessed the Lobos Creek supply, which it carried in a flume around the edge of the bay from Lobos Creek to Black Point at the foot of what is now Van Ness Avenue. At Black Point the water was pumped up the side of the hill into reservoirs at Francisco Street and Lombard Street. This delivery of water began on September 16, 1858, just eighty-six days after the incorporation of Spring Valley. The reservoirs, at Francisco and Hyde, and Lombard and Hyde, are still important units in the water system. The Lobos Creek flume has long since passed out of use, but the waters of Lobos Creek are still used by the United States Government to supply the Presidio Military Reservation, the Government

having acquired the Company's right to this water in 1915.

Pumps at Black Point are still in operation, supplying the same reservoirs. The water, however, comes from a different source, and the original pumps were replaced by the present ones in 1886 and 1892. This unit, after seventy-five years of continuous operation, is destined for a change. With the completion of the new San Andres line Black Point pumps will cease to be used as a regular part of the system, and only in case of an emergency will they ever operate again.

The Pilarcitos flume had a capacity of five million gallons daily. It soon became inadequate, and all that portion east and north of the present San Andres Dam, excepting the section in Suto Forest mentioned above, was replaced in 1868 by a pipe-line thirty inches in diameter and with a capacity of twelve million gallons daily. The construction of this Pilarcitos line was just being completed at the time of the earthquake in 1868. Spring Valley tradition has a vivid story about the consternation of the pipemen

who were working inside the pipe when the earth movement took place. They thought water had been turned into the line, but fortunately reassurance came to them quickly from their fellow workmen on the outside.

From that time on the installation of additional transmission pipes continued almost without interruption. Pipe construction and installation was much slower in those days, for most of the work now done by machinery had to be done by hand. It took years to do what is now being done in months.

The San Andres pipe of thirty-inch diameter was completed to College Hill Reservoir in 1871. This line was thirteen miles long. In 1898 five miles of this line between San Andres and Baden were replaced by a forty-four-inch pipe.

The Crystal Springs pipe-line was laid during 1884 and 1885. It is seventeen miles long and is now delivering into University Mound Reservoir twenty-five million gallons daily at an elevation of 171 feet.

The Alameda line, taking water from Alameda Creek at a point just above Niles, was laid in 1888 and 1889. It is thirty-six inches

in diameter, 28½ miles long, and delivered eight million gallons daily into the forty-four-inch Crystal Springs line at Burlingame. This line originally had two sixteen-inch submarine pipes, each 6400 feet long, crossing San Francisco Bay from Dumbarton Point to Ravenswood Point. In 1900 the capacity of the Alameda pipe was doubled—that is to say, it was increased to sixteen million gallons daily, by the construction of two additional submarine pipes of twenty-two-inch diameter; by diverting Alameda Creek water at Sunol instead of Niles, thus putting additional head on the pipe; and by constructing an aqueduct, or tunnel and wooden flume, down Niles Canyon to connect with the original Alameda pipe-line on the hillside at an elevation of seventy-five feet higher than the creek level where the line formerly started.

In 1903 the Alameda pipe was extended by the construction of three miles of fifty-four-inch line from Burlingame to Millbrae. This increased the carrying capacity between these two points and increased the amount of water that could be transferred



At the lakeside two tunnels will take water at different elevations



San Andres water will start toward San Francisco through this tunnel, eight feet high and eight feet wide

into the San Andres line at Millbrae, while still maintaining a full head coming into University Mound from Crystal Springs.

Spring Valley's first long transmission line, that from Pilarcitos, was retired from service after the fire of 1906. A substitute was provided by the construction of the Baden branch, seven miles long and thirty inches in diameter. A booster pump at Ocean View raised this water to the elevation of the Pilarcitos delivery point at Lake Honda. The Baden branch takes water from the San Andres line where that line passes Baden.

The Pleasanton pipe-line, thirty inches in diameter and six miles long, was laid in 1909. But by 1912 more transmission-line capacity was needed; so the carrying capacity of the Alameda line was increased by the installation of a booster pump at Ravenswood, thus bringing its capacity up to twenty-one million gallons daily.

By 1915 San Francisco was using more water than the Spring Valley system was then developed to supply. Consumption decreased when waste was eliminated by the installation of meters on all services throughout the city. Universal metering was completed in 1918. This effected such a substantial saving of water, without in any way reducing proper water usage, that the maximum consumption dropped several million

gallons daily below the daily capacity of the transmission lines. In 1925 the completion of Calaveras Dam increased the yield of the system by adding at least twenty-four million gallons daily.

Development of the Calaveras sources necessitated enlargement of transmission facilities in the Alameda division. A new conduit replaced the old one down Niles Canyon. The Niles Aqueduct has a capacity of seventy million gallons daily. It delivers water to the Niles regulating reservoir, whence a forty-four-inch pipe carries it to a point near Irvington. From there this portion of the supply is transported through the Bay Division of the Hetch Hetchy Aqueduct to the bay, across the bay, and to Crystal Springs Reservoir.

Owing to the acceleration in city growth that began about 1924, consumption rapidly approached the maximum capacity of the transmission lines. By 1927 all in touch with water conditions had come to agree with Spring Valley that the construction of a new major line was imperatively required. And so, at the cost of over one million dollars, the construction of the new San Andres pipe-line was begun.

It was decided that the new line should run to Lake Honda, the reservoir built to receive the first water that came from Pilarcitos in the early sixties. This reservoir holds forty-four million gallons and is 370 feet above city base, city base being a few feet above high tide in San Francisco Bay. The district supplied from Honda embraces about one-third of the city lying between two and three hundred feet in elevation. The present consumption in this district is seventeen million gallons a day.

With the delivery point in San Francisco decided upon, the source of supply for the new line was of more easy solution. Lake San Andres, the second storage reservoir constructed by the Company, lying in the hills west of Millbrae at an elevation of 440 feet, fitted all the conditions necessary to deliver water through the new line. Lake San Andres has a storage capacity of 6000 million gallons, with a yield, combined with Lake Pilarcitos, of nine million gallons a day. This lake is admirably situated so as to permit the pumping of additional water from Crystal Springs, through existing pumps and conduits, to make up for the

excess of draft over the normal catchment.

The last problem to be solved was that of capacity, for a line either too small or too large would cause an economic loss. A pipe fifty-four inches in diameter was finally selected, as a line of that size would deliver thirty million gallons a day to Lake Honda. This additional supply will care for the needs of the city for many years to come.

After taking bids on welded, riveted, and lockbar pipe, the contract for the construction of the line was finally awarded to the Western Pipe & Steel Company for the fabrication and installation of a lockbar line. The pipe-line will be 58,000 feet (11 miles) long. The plates used in making the pipe vary from seven-sixteenths to one-fourth of an inch in thickness, the line being designed to operate under a pressure of from twenty to more than two hundred and fifty pounds.

Lockbar pipe is pipe made from steel plates the same as riveted pipe, except that the plates are joined to form each piece of pipe by means of an ingenious barlocking device. Two plates, each thirty feet long and wide enough to make half of a pipe, are rolled to

a semicircle forming two troughs without the end pieces. One half is then placed on the other half, the lockbars being placed between the upset edges of each part. They are then strapped together. This holds them in place while the pipe is run through a huge hydraulic press that exerts a tremendous pressure on the bar, squeezing it down onto the plates with such force that the plates would tear before they could be pulled loose from the bar. This gives the pipe a smooth interior, offering the least resistance to the flow of water. The pipe is heated and then double-dipped—that is, it is lowered into a vat of hot asphalt, then withdrawn until the asphalt cools to the sticky stage, then re-dipped. This second dipping is a quick one, the pipe being lowered into the dip and withdrawn as rapidly as possible. The second dip makes a thick coating. To further protect the metal the pipe is then put into a spiral wrapping machine and wrapped with a felt similar to roofing felt, while a stream of hot asphalt is sprayed on the pipe and paper. By this method the steel is protected from corrosive action of moisture and soil.



Large screens protect the lakeside tunnels against intrusion of foreign substances

Pipe-laying, like pipe-making, is a machine-job nowadays. Very little of the labor is done by human hands. A big drag-line scraper, moving along on its own power, scoops out the dirt to form the ditch. The pipe is put on trucks by a crane and hauled to the job, where another powerful crane, built with caterpillar feet and able to move over the roughest ground, takes the pipe and places it in its proper position in the ditch. The usual riveted joint is made in connecting the lengths into one long continuous pipe. Riveting is done by air, and the familiar sound of the riveting hammer can always be heard.

Large gates will be placed in the line and connection made to the present lines, so that the whole system of supply pipes may be operated to the best advantage, thus insuring as constant a supply of water to San Francisco as is humanly possible.

Beginning at San Andres, for the first several hundred feet the pipe will run through a concrete-lined tunnel. This tunnel

is egg-shaped, eight feet high and eight feet wide at its widest point. At the lake side of the tunnel a concrete tower—really a concrete-lined pit—was built, its top being just above the high-water level of the reservoir, and the bottom fifty feet down in the ground. From this shaft two short tunnels were run out into the water, big screens being put over their outer ends to prevent any foreign substances from getting into the pipe-line.

Construction was started in February, the first piece of pipe being laid from Ocean Avenue along Junipero Serra Boulevard to Portola Drive, thence up Portola Drive to Dorchester Way. This section is now completed, tested, and ready for use.

Hardly was the first crew well under way when another began laying pipe at Baden, working its way northerly, just west of the State Highway, toward Colma. The pipe will pass west of Colma, run through Lake Merced Ranch, cross over to the east of the Junipero Serra Boulevard, and thence along the east side of Ju- [Continued to page 10]



Great machines dig these trenches and quickly close them over the installed pipe



The fifty-four-inch San Andres line that will increase daily capacity from fifty to eighty million gallons



San Andres Reservoir, head of the new Spring Valley line. White



aw this region in 1769, and it was named for St. Andrew in 1774

[Continued from page 6] nipero Serra Boulevard to the present completed part at Ocean Avenue. As winter passes and the land dries out, another crew will take up the work at Baden and lay southwest across the hills to the outlet tunnel at San Andres.

And so, before the summer is over, San Francisco will have another line bringing in water to keep up the never-ending race of supplying water to anticipate the needs of fast-growing areas. When completed, the job will stand as a monument to the best materials and the best methods of construction known at this time.

The problem of distributing water to consumers is always complicated by irregularities of terrain. San Francisco has many hills, each standing alone in the midst of low lands. Developed regions range from sea-level upward to almost nine hundred feet. San Francisco, therefore, is a most difficult city to supply. Out of the growth of the past seventy years have come six major districts, with twenty-odd smaller ones constantly forming and, as the city grows, merging with the larger districts.

The past few years have seen the formation of the Forest Hill district, the splitting of that when Stanford Heights Reservoir was built to form two districts, and the merger of Stanford Heights with Clarendon Heights to supply the fastest-growing area within the city. These changes represent the inevitable result of city growth.

The development of the new thirty-million-gallon additional capacity has again forced changes in the city system, this time not in the districts themselves but in the manner of supplying them.

At present the Crystal Springs pipe-line supplies water to University Mound district to its maximum capacity of twenty-five million gallons per day. Of this amount, three millions are pumped by the Black Point pumping station into the Presidio Heights district, and slightly less than three by the Clarendon Heights Pumps into the combined Stanford-Clarendon district. This leaves but nineteen millions to supply the University Mound consumers, an amount that is rapidly becoming inadequate. If Presidio Heights and Stanford-Clarendon can be supplied from another source, the full twenty-five millions will remain available for the use of the lower district.

The next higher district, College Hill, is supplied by gravity from San Andres Reservoir. This is a solidly built district; the present supply of seven million gallons daily is adequate and will probably be so for many years.

When we get above College Hill, the water requires pumping. All the water for Lake Honda, amounting to about seventeen millions, is pumped mainly by three stations, Central, City, and Ocean View, with a limited amount from Clarendon, and occasionally from Precita Valley, though the last station has not been operated regularly for some time past.

Going still higher, Stanford-Clarendon, at 615 feet elevation, is supplied by the Clarendon Heights Pumps, as before mentioned, and Forest Hill, at 800 feet elevation, by an electrically operated pumping station taking water from Lake Honda. The Presidio Heights district, a closely built little area, just too high to be served from Lake Honda, is now supplied from the Black Point Pumps.

With the advent of the new line, Lake Honda will be supplied with gravity water. Until the daily consumption passes the capacity of the line, the operation of the pumping stations will be unnecessary, except that the City Pumping Station will be operated with water from Lake Merced, which is an independent source of supply furnishing about three and one-half millions daily.

To relieve the University Mound district, the supply for both Presidio Heights and Stanford-Clarendon will be taken from the present supply to Central Pumps. Two new turbine-driven centrifugal pumps will force the water against two hundred pounds pressure up into Stanford Heights Reservoir. A new twenty-four-inch pipe-line, designed to withstand the high pressure, will be laid from Central Pumps along Sloat Boulevard and Portola Drive to Stanford Heights Reservoir. A new basin will be built adjoining the present one, which will increase the storage capacity from five to more than ten million gallons.

The Stanford-Clarendon pipe system will be reinforced by new twenty-inch and sixteen-inch pipes to the Clarendon Heights tank. From that point a twenty-inch line over 13,000 feet long will be run northerly and easterly across [Concluded on page 11]

Bird Life at San Andres

By Olive Burroughs

THE February field trip was taken on Sunday, the 12th [of February, 1928]. Going by stage to Burlingame, the party alighted at Easton Drive, walked in leisurely fashion to the ridge, where lunch was eaten, followed down the flume to the dam, and then skirted the shores of San Andres Lake. From here, the way led up to the road and out to the highway at Uncle Tom's Cabin, where street-cars and automobiles were requisitioned. Some of the party returned early; others remained for a longer day.

The day was bright and still. A creeper's note was heard as we started up the avenue, but the bird could not be located among the tall trees here. Excursions down the sunny side streets, however, revealed the presence of many old bird friends, most numerous among which were the chickadees, bush-tits and Audubon warblers.

A Hutton vireo called repeatedly from a tree by the roadside as we started up the hill. Out in the open three hawks soared and displayed their red tails.

A few pipits and meadow-larks were seen while we were at lunch at the top of the ridge. This was good horned-lark country, but none was spied until the party resumed its way after lunch. Then, just beyond the crest of the hill, two were found feeding, and they formed the center of interest for several minutes.

A flock of fourteen band-tailed pigeons was sighted as we approached the lake. At the lake were seen several great blue herons, grebes, coots, mallard and ruddy ducks. Some of the party went down to the lower end of the lake to see the Canada geese, the scaup and the ruddy ducks at close range.

Birds encountered were: Western American eared, and pied-billed grebes; California great blue heron; honker Canada goose; mallard, canvas-back, scaup and ruddy ducks; Northern turkey vulture; sharp-shinned Western red-tailed, and desert sparrow hawks; coast California quail; American coot; spotted sandpiper; California gull; Northern band-tailed pigeon; Anna and Allen humming-birds; Western belted kingfisher; downy woodpecker; Monterey red-

shafted flicker; Northern say and black phoebes; California horned lark; Southern coast stellar and Southern California jays; California plain titmouse; Santa Cruz chestnut-backed chickadee; Pacific Coast bush-tit; intermediate wren-tit; Vigor's Bewick wren; dwarf hermit thrush; Western robin; Western Mexican bluebird; ruby-crowned kinglet; American pipit; California Hutton vireo; Pacific Audubon warbler; Western meadow-lark; California Brewer blackbird; California purple finch; California linnet; green-backed Arkansas goldfinch; Northern pine-siskin; San Francisco spotted and San Francisco brown towhees; fox sparrow, Point Pinos Oregon junco, Nuttall white-crowned, golden-crowned and Santa Cruz song sparrows—53 species.

Members in attendance: Mesdames Brace- lin, Kibbe, Mexia; the Misses Burroughs, Ethel Haefner, Paroni, Payne; Dr. Card; Messrs. Bacon, Bryant, Lockerbie, Myer. As guests: The Misses Kautz, Meyer; Messrs. Friedman, Jussel, Vick; Scouts Dave Bacigalupi, Armand Barnett, Milton Friedman, Dick Jacobi, Jess Openheimer, and Bill Rousseau. Thirteen members and eleven guests.

—From *The Gull*, published by Audubon Association of the Pacific for the Study and Protection of Birds.

* * *

Abundant Water

[Continued from page 10] the Panhandle, then on through the Western Addition, finally terminating in the Presidio Heights district at Lyon and Washington streets. There the new pipe will be connected to existing mains through large pressure regulators which will so control flow that water will be supplied to the faucet under most advantageous pressure.

These changes will require the laying of 31,000 feet of pipe, the installation of two nine-million-gallon pumps, and the construction of a reservoir of five million gallons capacity.

All to the end that abundant water may make for civic prosperity.

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Laguna Honda

HIGH up above the moiling town
Beside a forest glen,
Where scented blossoms tumble down
To shield a fairy fen,
A placid pool of heaven tones
Lies smiling in the sun,
And by its side through piñon cones
The woodland creatures run.

Upon its brink you stand and gaze
Into the limpid blue
When comes a most ecstatic haze
To weave a dream for you.
You dream of beauty pure and chaste
And Romance smiling near;
A rhythmic life devoid of haste,
With music ringing clear.

You hear the gurgle of a child,
A mother's gentle croon;
And Truth smiles upward, undefiled,
To match the heart, attune.
There's something purifying, sweet,
In water still and blue;
'Tis there the soul and heart may meet
And plan a life anew!

—Miles Overholt, in *S. F. Call*.

* * *

Sunset and Skyline

WE shall never be choked to death—that is, those of us who have no expectation of committing a capital crime. Close your desk at five o'clock in a San Francisco office and the country is but ten minutes away.

Is that a slight exaggeration? Not if you can make the Panhandle in ten minutes. Ap-

praisers fix Fourth and Market streets as the business vortex, and it can be done from there without violation of the traffic rules.

Once at the Panhandle, a wooded avenue leads on into the gardens and meadows of Golden Gate Park. Sheep in the low meadows and bison in the wooded glade. A strand of silver surf gliding by and then a quick lift to the Skyline. Surely this is country and seashore.

In the lake country. It is never spoken of as such, but if we had less water hereabouts in bay and ocean San Francisco's "lake country" would be famous. Merced, San Andres, Crystal Springs, Pilarcitos—and twenty-five miles of fresh water on the very rim of the briny Pacific.

Traveling over rough country and unblazed trails we always keep to the high ridges. Canyons are devious and tricky. Above one can keep his bearings. That's the Skyline—the place to correct mental bearings. The inevitable Orient on one hand; Diablo, our base line; Hamilton, with its eye peeping into the secrets of heaven; the Berkeley Campanile prying open the intellectual midstratum, on the other.

Thoughts come pouring in.

"The time has come," the Walrus said,
"To talk of many things:
Of shoes—and ships—and sealing-wax—
Of cabbages—and kings."

The Skyline presents the cabbage-patch and cuts through the fairways of California's royal sport. Golf is winning. The cabbage is in retreat. There was a time when the cabbage-patch had no fence. Now it seeks the protection of the law. Twenty-five dollars is the price of a head of cabbage—if heedlessly plucked on the theory that it belongs to the indigenous flora of the land.

A California Skyline must necessarily lead to mountains, and without effort you find yourself on Kings Mountain, in the redwoods, among the summer cabins.

La Honda and a trout for dinner. There is no closed season on the trout farm, and the "silver eagle" is a fly that never fails to get a rise.

Another "close-up" of San Francisco. It is the place where there is no question of a choice between the city and the country. You can have both between five o'clock and sunset.—Robert H. Willson, in *S. F. Bulletin*, February 16, 1928.

Appraising a Man

Address Delivered before the Burlingame Rotary Club

By the Editor

MR. GEORGE DAVIS will agree with me that in the service of Spring Valley Water Company we find it necessary to study many things besides water, its sources and its distribution. One of these many things—and one about which Mr. Davis knows a great deal, while I know very little—is the difficult subject of valuation and appraisement as applied to all sorts of water-supply properties. A whole library of books has been written on valuation and appraisement. Every time a public utility appears before the Railroad Commission or any other authority, this subject of valuation and appraisement is very much in the foreground.

As publicity man for Spring Valley Water Company, I have had to read about valuation and appraisement a good deal, but I must confess that my knowledge of the subject is extremely superficial. However, it has frequently occurred to me that some of the rules of valuation and appraisement may be applied to human nature in such a way as to yield some fruitful maxims, and so I shall endeavor to use the principles and methods that govern valuation for the appraisement not of man's property but of man himself.

THE VALUATION OF A MAN! Here is a subject as old as the world and as new as any infant born today.

"The proper study of mankind is man," said Alexander Pope; and all our study of man, all the conclusions we draw about ourselves and our fellow men from a lifetime of experience, observation, and thought, are not thrown away if they enable us to place a proper valuation upon you and me.

"The more I know about men, the more highly I think of dogs," said a brilliant woman; but she was a pessimist and a cynic. Her valuation of men had been insecurely based on romantic idealism and had led her through sentimentality to disillusion and from disillusion to bitterness. She was a prejudiced appraiser.

I prefer the words of Shakespeare: "What a piece of work is man; how noble in reason;

how infinite in faculty; in form and moving, how express and admirable; in action, how like an angel; in apprehension, how like a god!" Shakespeare had a sound idea of the worth and dignity of human nature. He was a good appraiser.

What is value? "Value," says H. D. Macleod in his "Elements of Economics," "is a substance which measures the estimation in which men hold things. When there is a demand for things, they have value; when there is no demand, there is no value."

Apply this definition of value to man: The value of a man is the estimation in which he is held—the demand that exists for him. If there is a demand for a man, he possesses value—if there is no demand for him, he is without value.

The obvious application of this definition of a man's value is in the labor market. Every man who is fulfilling the purpose for which he was placed on earth is a laborer. And for every laborer there is some kind of demand. Every laborer has a certain value. For the wastrel, the incurable idler, the gilded popinjay who spends an unearned increment, the human parasite who does not labor—for all these men there is no demand; such men have no value.

Economists, and appraisers who apply the principles of economics, make a distinction between value and price.

Price is value translated into money. But price is not synonymous with value, for value is only an estimate of what price ought to be. Price is a question of fact—value is a question of opinion. Hence, price is more easily ascertained than value.

There is a cynical sense in which it is said that every man has his price. But the cynic is usually a liar; so we shall not pause to place a valuation on this favorite remark of his.

There is, however, another sense—and I am speaking now of the labor market—in which it is quite true that every true man—that is to say, every laborer—has his price.

The law of supply and demand fixes our

price for all of us who are laborers. Sometimes that price is the full measure of our value. Sometimes that price is higher than our true value. Sometimes it is lower.

If the price we command in the labor market is higher than our true value, one of two things happens. Either we are eventually found out, and our price declines; or, realizing our shortcomings, we increase our value by redoubled efforts, by harder work and more stubborn application, until we are earning our price by yielding full value to our employer.

It is a wholesome thing for any man who is receiving a good wage, a satisfactory salary, to reappraise himself from time to time in order to ascertain whether he is giving value to the full measure of his price.

If an honest appraisal tells him he is overpaid, he will know what to do. He need not resign his job—that is heroic, and not to be expected. But let him work harder, and so bring his value up to his price.

If, after such appraisal, he concludes that he is not overpaid, let him beware of attaching too much importance to the appraisal. There is always the chance that he is a poor appraiser. A very safe rule in such cases is to go over the items again with scrupulous care and a little more humility of spirit. The man who thinks he is yielding full value for what he earns generally has an exaggerated idea of his worth.

According to the decision of the United States Supreme Court, "the value of property results from the use to which it is put." This is true of men. The value of a man results from the use to which he puts himself. The moral to be drawn from that statement is obvious, and I shall not enlarge on the idea.

Experts in valuation distinguish several kinds of value. These are usually listed as follows: scrap or junk value; salvage value; service value; potential value; going value; going-concern value; and permanent or fair market value.

Let us see if these values mean anything when applied to a man. And first of all, scrap or junk value.

"All physical property," says Henry Floy, "has a certain scrap or junk value, beyond which there is no depreciation. Hence, physical property can deteriorate only until it reaches its scrap value. This value is simply

the fair market price that a purchaser will pay for the property in its disintegrated condition."

We are not called upon to apply this principle to man, unless we are thoroughgoing materialists. If one believes that man is a mere machine, worthless when the heart stops beating, one may definitely trace his descent from degradation to degradation until he has naught but a scrap or junk value. But man has a soul to be saved, and in the most consoling of creeds that soul, while it animates a living body, never reaches the point of worthlessness. While there is life there is always another chance for a man, no matter how wantonly he may have depreciated his spiritual value.

Sometimes equipment in good working shape may not be adapted to one plant, and yet could render good service in another. This is technically called salvage value. Apply the idea to a man.

If a man is not adapted to his job—if the working conditions have outgrown him—he is a misfit and is not giving full value. Transferred to another job, his value may be enhanced. Lucky the man who discovers for himself that he is a misfit, and has the courage to act on that knowledge. The world is a hard taskmaster, and if the knowledge does not come to him spontaneously, it will be forced upon him.

Wearing value is defined as the difference between original cost and scrap value. What is the original cost of man? It is the sum of a series of tremendous investments. It includes all that was put into a man by his ancestry—the aspirations, the passions, the emotions and tendencies bequeathed to him by his forefathers from the beginning of the world. It is all that his forefathers endured in the long, hard upward swing from barbarism to civilization. It is, more immediately, all that he inherited from his mother and father—those wondrous possibilities of good to which he fell heir when he was conceived in the womb. The original cost of a man is all that his mother invested in him when he knelt at her knee, all that his father bestowed when guiding his first faltering steps in the right path of a strange world. It is all his training and education, all the sacrifices that were made for him, all the anxiety and care that were lavished upon him. The original cost of a man cannot be calculated.

A merciful provision of nature permits a man's mother to forget the pangs in which he was born, and a merciful providence does not cast up too accurately all that was invested in the making of a man, else none of us would dare hold up his head in the sunlight or face the dark unterrified.

The wearing value of a man which is calculated from his original cost is too vast, too fearful a subject, and I pass on.

We are on less dangerous ground when we come to the service value of a man. Again I go to Henry Floy for a definition of service value: "Property, honestly and intelligently purchased with a view to its suitability for the service intended, maintains its original value practically throughout its life, except for such deterioration as results from wear and tear."

This is an encouraging doctrine when applied to the valuation of a man. Let us adapt it to our present purpose, as follows: A man who is honestly and intelligently devoted to his work maintains his original value practically throughout his life, except for such deterioration as results from wear and tear.

That is a principle of action accepted by every liberal-minded employer. Years of honest labor bring inevitably a slowing-up of mental processes and manual dexterity; but what is lost that way is compensated for by the accumulated riches of experience. Were it otherwise, there would be no elderly men in office or factory.

While one-hundred-per-cent efficiency may be the standard of perfection in labor, there can be no such thing measured by merely mechanical means. The mind may function actively while the arteries are getting hard. The service value of a man is not exclusively the record of his time-clock.

Potential value is the value that may come through future growth or economic change. In other words, potential value is largely the substance of things hoped for. Every man, in his own estimation, has unlimited potential value.

Up to a certain point all of us realize our potentialities. At a certain point most of us are content to cease striving and merely to dream. The great man is he who keeps on year after year realizing more and more of his potentialities. There are very few great men.

The potential value of a man is always

interesting because it is speculative, and we all like to speculate, but after a certain age it is not important. Every man may fix that age for himself. Every man will probably fix it ten or fifteen years from now. If we faced facts too honestly, life would be intolerable.

Going value in property valuation is the cost to the owner of bringing the plant to a self-supporting basis. It is also called development expense. It is based on the losses incurred in the earlier years of operation; it is the uncompensated cost of building up the business.

The going value of a man may be said to include the expense of fitting him for work, for business life. This embraces all the expense of his education—not merely the total expended in tuition fees, but those other important expenses which vary with the particular manner in which each man educates himself. With one young man these expenses may include the sums he loses at poker before he is sufficiently educated to realize that success in poker is a career, not a recreation. With another young man these educational expenses may include the money he squandered in a futile endeavor to nullify the Volstead Act.

In other words, a man's going value includes all the expenses, whether foolish or otherwise, which he incurs in bringing himself to maturity and common sense. They are the expenses of his development. It is worth noting, as a warning, that all of these expenses are not allowed in up-to-date valuation.

Going-concern value is next on our list. It is defined as "the value which is added to the physical value of a plant by virtue of the successful and harmonious operation of the whole, and the co-ordination of the various parts."

The going-concern value of a man is the value which springs from the fact that body and brain are functioning properly, that he is "hitting on all cylinders." This value presupposes that he leads a normal life, that he treads with tolerable regularity the straight and narrow path. Dissipation decreases a man's going-concern value. Let him who is without sin appraise the other fellow's going-concern value.

Finally we come to fair market value. This is defined as the price accepted by an owner willing to sell to a purchaser willing

to buy at a fair price, and at a sale that is not forced.

When a man enters the labor market to sell his labor, he quite naturally seeks his full market value. He does not always get it. The labor market may be overstocked. Buyers may be conservative, not to say skeptical. The man himself may not be a good salesman.

Stern necessity sometimes impels a man to accept less than the fair market value of his labor. Let him not be ashamed of so doing. Better by far to labor for an inadequate wage than to remain idle while waiting for one's fair market value.

Work is honorable, and is never thrown away. The man who does not hesitate to work at an inadequate wage rather than not work at all, is more likely to attain his fair market value than the man who elevates his nose and twiddles his thumbs while waiting for the ideal job to turn up.

It may be set down as a rule that the man who values himself a little modestly will eventually get his fair market value; and what is more, not having overappraised himself, he will never have to forfeit his self-respect.

There are certain other principles of valuation which may be applied with propriety to the valuation of a man. For instance,

there is the theory of intangibles. Intangible values, on the authority of our highest courts, cannot be ignored in making a valuation.

Employers should never forget that every good working man has a certain intangible value which cannot be elicited from a man by the most cunningly contrived questionnaire, or put down in black and white on a time-card. At the same time, no laborer should be encouraged to attach too much importance to intangibles. If a man begins writing intangibles into his expense account, he should be taken aside and reasoned with, quietly but firmly.

Another very important principle of valuation is expressed in the thought that the only practical value is present value. The man who tries to sell his labor at last year's value is one year behind the times. He needs a lesson in the doctrine of depreciation. The man who tries to sell his labor at what he thinks will be his value next year—at his potential value, in other words—ought to have his head examined.

This in conclusion: When it is necessary to arrive at your own value, it is advisable to call in other appraisers to check your figures. There never yet was a self-appraisal that could stand the test of impartial cross-examination.

Drink Plenty of Water

AN NEW YORK chain restaurant has counted the people who eat in its restaurants and has learned that only twenty-nine out of every hundred patrons drink the water that is set at every place. Therefore the restaurant, to save water bills and dishwashing charges, will serve no water unless requested.

Instead of doing this, the restaurant should try to change human habits a little by urging people to drink water, placing signs, if necessary, in every restaurant informing patrons of the necessity of plenty of water.

Every doctor tells his patients to drink at least eight glasses of water a day as a preventive of sickness. Clean hands carry the minimum of disease dirt; clean intestines harbor a minimum of germs, and everybody should know that.

The only thing that is wrong about advising people to drink water is that the remedy is *too easy*. Doctors know that if they tell people to do a simple thing, they will *not* do it; but if they advise a complicated and mysterious remedy they will accept it eagerly. Even Plato complained, twenty-two centuries ago, that people who pay for the advice doctors give them will not follow it if it means a change of habits. They want something *cut out*.

But eight glasses of water a day will cut out many a visit to the doctor.—*S. F. Call, February 23, 1928.*

* * *

THE picture on the cover of SAN FRANCISCO WATER shows the laying of the new San Andres pipe-line in St. Francis Wood.

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BEFORE DAYLIGHT
I SAID MASS, AS IT WAS
THE FEAST OF SAN
ANDRES. FOR THIS
REASON THIS VALLEY
WAS CALLED SAN
ANDRES, BECAUSE THE FIRST EXPEDITION
THAT PASSED HERE DID NOT GIVE IT A
NAME ON ACCOUNT OF NOT FINDING
ANY VILLAGE, WHILE NOW, IN THE
SHORT STRETCH THAT WE HAVE
TRAVELED, WE HAVE FOUND FIVE LARGE
ONES. FROM THIS IT IS INFERRED THAT
THE COUNTRY IS WELL POPULATED AND
THAT THE INHABITANTS MOVE THEIR
VILLAGES READILY FROM PLACE TO
PLACE.

FROM THE DIARY OF FRAY FRANCISCO PALOU,
NOVEMBER 30, 1774

by 1928

SAN FRANCISCO Water



THE COOL, GREY CITY OF LOVE

(SAN FRANCISCO)

Tho I die on a distant strand,
And they give me a grave in that land,
Yet carry me back to my own city!
Carry me back to her grace and pity!
For I think I could not rest
Afar from her mighty breast.
She is fairer than others are
Whom they sing the beauty of.
Her heart is a song and a star—
My cool, grey city of love.

Tho they tear the rose from her brow,
To her is ever my vow;
Ever to her I give my duty—
First in rapture and first in beauty,
Wayward, passionate, brave,
Glad of the life God gave.
The sea-winds are her kiss,
And the sea-gull is her dove;
Cleanly and strong she is—
My cool, grey city of love.

The winds of the Future wait
At the iron walls of her Gate,
And the western ocean breaks in thunder,
And the western stars go slowly under,
And her gaze is ever West
In the dream of her young unrest.
Her sea is a voice that calls,
And her star a voice above,
And her wind a voice on her walls—
My cool, grey city of love.

Tho they stay her feet at the dance,
In her is the far romance.
Under the rain of winter falling,
Vine and rose will await recalling.
Tho the dark be cold and blind,
Yet her sea-fog's touch is kind,
And her mightier caress
Is joy and the pain thereof;
And great is thy tenderness,
O cool, grey city of love!

—GEORGE STERLING.

SAN FRANCISCO WATER

PUBLISHED BY
SPRING VALLEY WATER COMPANY
SAN FRANCISCO, CALIFORNIA

VOLUME VII

JULY, 1928

NUMBER 3

Yerba Buena ✦ July 9 ✦ 1846

BY GEORGE STERLING

*To Columbia, the Mother, a dark-eyed babe was brought
In that far year when Mexico and our young legions fought.
Around her mighty footstool then stood offspring east and west,
But never one like that strange child she gathered to her breast.*

*And never one Columbia held gladlier her own—
A babe, a child, a wistful girl, a maiden fair and grown.
Awhile she sought the fostering breast, and ere its milk was cold,
She brimmed the Mother's needy lap with tribute of her gold.*

*Then year by year her empire grew, from snows to ocean sands,
A wonder-tale, a song of hope, a star to sadder lands.
There gleamed that El Dorado, the bright Hesperian Isles,
Wherever woke the fadeless flower to Nature's tender smiles.*

*Thrice happy they who on her hills find sustenance and peace,
No seas more blue 'round Italy, no skies more mild o'er Greece.
Careless and prodigal from youth, no thought of thrift she knows,
Who to her sisters north and east holds forth the grape and rose.*

*Yet can she never be as they: her wilder blood demands
A richer music, madder love, than those of colder lands.
The hoyden of her Mother's hearth, she finds in every vein
The Saxon urge, the Norman dream, the impassioned blood of Spain.*

To Remember George Sterling

DURING the noon-hour of Monday, June 25, 1928, an informal and unostentatious ceremony took place on a little bit of ground at the crest of the Hyde-street hill in San Francisco. It was the dedication of a bench placed by Spring Valley Water Company in remembrance of California's great poet, George Sterling.

Just seventy years ago a reservoir for the water service of young San Francisco was built on the block of high land bounded by Hyde and Larkin, Greenwich and Lombard streets. The reservoir is still in use. Just below the sloping southern wall of this Lombard-street Reservoir (as it is called), there is an open and level space where for years mothers have brought their children to play in the sun and where lovers loiter at sunset to enjoy the gorgeous evening pageantry of the Golden Gate. This spot was selected as the most appropriate of all places in Spring Valley ownership for a memorial to the departed singer.

The idea of such a memorial was conceived by S. P. Eastman, president of Spring Valley Water Company, and its execution was entrusted to Gardner Dailey, architect and landscape artist. Mr. Dailey's plan called for a bench uniting beauty with utility, placed at the end of a graveled walk enclosed by trees. The bench was executed by Gladding, McBean & Co. in decorative tile, a medium still new and strange to the general public but widely recognized by artists as a superb vehicle of beauty. Inset is a memorial tablet in bronze. Plane trees that will grow up and interlace their branches were planted on either side of the approach. Behind the bench will rise a screen of noble Monterey pines.

The bronze tablet bears the words "To Remember George Sterling, 1869-1926,"

with a quotation from Sterling's "Ode to Shelley," and a selection—words and music—from the "Song of Friendship," which was the joint composition of George Sterling and Uda Waldrop. This song has never been published. The "Ode to Shelley" appeared several years ago in *Scribner's*, but is not included in any of Sterling's books.

A group of George Sterling's intimate friends assembled for the informal ceremony of dedication. In explaining the purpose of the gathering, Edward F. O'Day told how Mr. Eastman had suggested a memorial shortly after Sterling's death.

"In common with all true San Franciscans," he said, "the president of Spring Valley appreciates the worth of George Sterling both as a poet and as a man. He realizes how much George Sterling means to San Francisco, and how much Sterling loved San Francisco. This feeling of appreciation,

I think, is very wide-spread in our community. People who never met George Sterling regard him as one of our great figures, as one of the men who typify what San Francisco stands for in the world of art. That position of George's was strengthened by some of his finest poems—his 'Exposition Ode,' his 'Evanescence City,' and his 'Cool, Grey City of Love,' one of the loveliest things George ever wrote.

"And so Mr. Eastman thought that it would be a sweet and appropriate thing to place on Spring Valley property a little simple memorial that would not be conspicuous, in a place where it would not thrust itself upon the attention of San Franciscans and of visitors, but would have to be sought out, or would bring the thrill of accidental discovery. This bench with its appropriate inscription is the result of that thoughtfulness.



"These properties, after seventy years of Spring Valley life, will shortly pass from private ownership to the control of the City and County of San Francisco. It seems a happy circumstance that a company so long identified with San Francisco life should devote one of its final gestures to the honor of our greatest San Francisco poet."

Recalling that George Sterling had a genius for friendship, and that, like the Romans, he valued friendship above all other virtues, the chairman requested Charles Bulotti to sing the "Song of Friendship," written by Sterling and commemorated on the bronze tablet of the bench. Uda Waldrop, who composed the music, accompanied Mr. Bulotti. The words of the song follow:

"Give, O Gods, a laughing lass,
Give, O Gods, a brimming glass—
But to crown the blessing, send,
Kindly Gods, a faithful friend.

"Is there one who drinks alone?
Then his heart is but a stone.
He who clinks his cup with mine
Adds a glory to the wine.

"Shadows come and shadows go—
At the last we well shall know
When the fleeting shadows fall,
Friendship is the best of all."

Haig Patigian, sculptor of national celebrity and twice president of the Bohemian Club, spoke briefly about George Sterling, emphasizing those traits of kindness and humanity that made him lovable. He said that no more appropriate spot could have been chosen for a memorial to a poet who so deeply loved San Francisco, and particularly the hills commanding the Golden Gate.

A song of which George Sterling was particularly fond is "The Soft Caress of the Night," written by Waldemar Young and set to music by Uda Waldrop. This was sung very beautifully by Mrs. Uda Waldrop. The words are as follows:

"At twilight, gentle ghosts, arrayed
In mists of lavender, invade
The forest aisles as faintly hums
The tiny beat of cricket drums
And night's first overture is played.

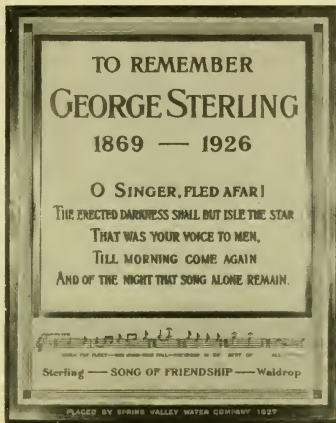
"The soft caress of the night,
The kiss of a truant breeze,
The glint afar of a dancing star,
The lace of a thousand trees:
Ah, Love, you have loved all these,
And so, on the perfumed night,
You have sent me a thought through
the trees—
It's your kiss, on the wand'ring breeze."

In concluding the ceremony, S. P. Eastman summed up its meaning in this terse sentence:

"It is proper that a company serving the material needs of a community should honor the spiritual things that give life its true value."

Before the simple dedication was over, children were gathering around, and as the guests went away, there was young laughter in their ears. The bench was already a part of their playground.

Among the invited guests were the following: Vail Bakewell, Mr. and Mrs. Phil Bekeart, Edward Benjamin, Albert Bender, Mr. Bigin, Mr. and Mrs. Chas. Bulotti, Mrs. C. Tobin Clark, Mr. and Mrs. J. B. Coryell, Templeton Crocker, Mr. and Mrs. Earl Cummings, Mrs. Marian Cunha, Charles S. Cushing, O. K. Cushing, Mr. and Mrs. Gardner Dailey, Mr. and Mrs. Charles Dickman, Mrs. Denis Dimond, Mr. and Mrs. Maynard Dixon, Charles C. Dobie, George Douglas, Mr. and Mrs. S. P. Eastman, Mr. and Mrs. G. A. Elliott, Frank English, Sara Bard Field, Roy S. Folger, Harry Francis, Porter Garnett, Mr. and Mrs. McKenzie Gordon, Mrs. Kenneth Gregory, Fred W. Hall, Mr. and Mrs. E. H. Hamilton, Mr. and Mrs. L. W. Harris, Mrs. Frank C. Havens, Mr. and Mrs. Homer Henley, James Hooper, Colonel [Concluded on page 16]





The bench to remember George Sterling is on a San Francisco hill that commands the Golden Gate

Sterling: A Tribute

By Idwal Jones

[S. F. Examiner, November 18, 1926]

GEORGE STERLING, touching on his fifty-seventh year, and feeling wearied turned his face to the wall and died. He quitted this life from his little room in the Bohemian Club, and with no more regret than a bird quitting a twig.

This was somewhere between 7 o'clock of Tuesday night and noon yesterday. No matter when. For the curtain had fallen on the drama of San Francisco's Bohemia in which he had been master of revelry for two golden and charming decades.

The Dionysian had drunk the cup to the lees, and found the end of life bitter. The reason for living was past finding out. He

said good-by to no one. To say good-by would have caused his friends grief. They are many, and they all wept, for he was an exquisite poet, and a charming and loyal friend.

I last saw him two weeks ago. We had walked arm in arm through dense fog at midnight, and we parted after a stop at a street corner where he talked on friendship.

"I hope the best thing any one will say about me," he said, "is that 'George was a Roman for friendship, and that he learned the lesson from his master, Ambrose Bierce'."

He turned abruptly and disappeared into the fog with his shapeless hat oddly perched



Men who loved George Sterling:

John Henry Nash, A. M. Robertson, Haig Patigian, Uda Waldrop, Albert Bender, Edward H. Hamilton

on his gray hair. He lived, a poignant, lonely, mournful figure, with his pinched Dantean face fallen on his shoulder like a medieval saint on a church window.

He had an accountable reason for disappearing thus. He loved the fog. He celebrated it in the lines:

"Though the dark be cold and blind,
Yet her sea-fog's touch is kind,
And her mightier caress
Is joy and pain thereof;
And great is thy tenderness,
O cool, grey city of love!"

Lest anyone who entered the room find anything that might be taken as a farewell, he burnt all his letters and photographs, except those that hung framed on the wall. In one of these was exhibited the handsome sardonic face of Ambrose Bierce. He had been meditating a life of this old friend who had so influenced his life. The sole data he had gotten together so far was a clipping of the poem Sterling had written on him. It was

one stanza, penned after Bierce's supposed suicide:

"Were his a reason to embrace
The Roman's dignity of death,
Whose will decreed his final breath,
Determining the time and place,
Be sure his purpose was a pride,
A matter not of fear but taste.
When finding mire upon the waste,
And hating filth, he turned aside."

Sterling's sudden and last illness mortified him. He had planned for weeks to be host to his close friend, Henry Louis Mencken. He was inadequate to the task. We had planned a dinner for him for Tuesday night, and Mencken called at the club with Drew Chidester and Gobind Lal to bring him to the rendezvous. Mencken smote at the door, but there was no answer.

"It's no use," said the critic; "he has locked himself in. He was up and about yesterday, but from the look on his face, I fear we shan't see him much longer."



Participants in the ceremony: Uda Waldrop, Mrs. Uda Waldrop, Haig Patigian, Charles Bulotti

When Mencken learned the news the next morning, steel-nerved philosopher and cynic though he may be, he was greatly affected.

"A noble fellow, and I came across the continent on purpose to see him."

Sterling was an artist, among the most finished and erudite poets in the country. At times he was terribly ashamed of being regarded as a poet. He was proud of his muscles—and a finely set-up fellow he was—up to five years ago, a clever boxer, good at sailing a yacht, a mighty walker. And he had his practical streak. He knew figures, and could draw them up with the skill of a chartered accountant.

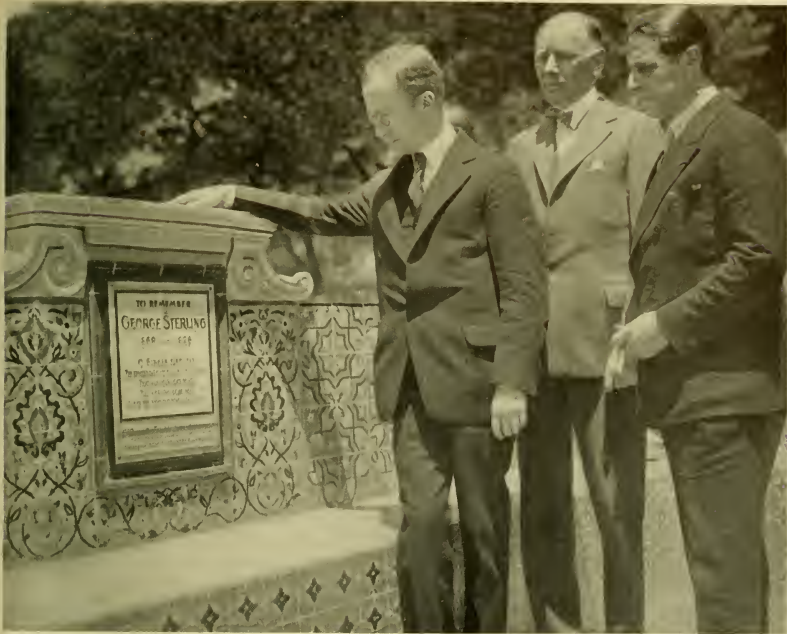
When Jack London built the big dam across his ranch at Glen Ellen, it was Sterling who made the plans and ordered the materials with such shrewdness that when the job was done—and a staunch, handsome dam it was—not a pound of nails or a sack of concrete was left over.

His feet were firmly on Plymouth Rock,

but his head was often in the pretty clouds, and he loved to champion the cause of whatever fanatic appealed to his sympathy. He upheld the electronic theory of Dr. Abrams as the last word in science. He ranked Upton Sinclair with the noblest thinkers. He besought the less impecunious Bohemians to invest in some astounding device calculated to ward off lightning and reveal oil wells, and thereby grow rich.

He regarded himself in exalted moments as a very great poet; but his friendship for a local publisher prevented him from sending his poems to the leading Eastern firms. He would sweat and toil over a sonnet for months—then give it away to someone.

From the days when he was king of gaiety at Papa Coppa's, "with the jug behind the door," and read his merry, not to say Rabelaisian, rhymes, up to a month ago, his best conceits were done as gifts for his friends. He had a pocketful of happy rhymes always. He never got over a horror of selling



The memorial tablet: Edward F. O'Day, S. P. Eastman (author of the tribute), and Haig Patigian

them for cash. Less than a hundredth of his stuff saw print, and the world lost some capital foolery, like the famous "Abalone Song."

Yet his published output is of respectable dimensions. There were "The Testimony of the Suns," "The House of Orchids," "Beyond the Breakers," "The Caged Eagle," "Sails and Mirage," and the formidable dramatic poems, done in the grand "Hyperion" style of Keats, and not approached by any other singer in the land, "Truth," "Rosamund," and "Lilith," this last first printed on butcher paper on a hand press in Ukiah.

One night, at a memorable studio party given to Hugh Walpole, the English novelist, a happy affair that lasted until dawn, when the windows and the furniture were broken, he launched into a serious and impassioned reading of "The Binding of the Beast." It was spread-eagle stuff, delivered

in a high, melancholy scream—and frightened everybody for a moment. But that mood was soon over, and he joined violently in the fun. He boxed terrifically with someone, and scored a knockout. Sterling had trained with Young Peter Jackson and had sparred with such terrors as Young Griffo and the Harlem Coffee Cooler. Early the next morning—probably after no sleep—he pulled on a sweater, donned a cap, and did a heel-and-toe to the beach and back with Billie Leonard, the wrestling professor at the Olympic Club.

Another paradox: Though one of the most melodious of poets, music bored him to death. He had a horror of concerts, and a recital was a species of Chinese torture to him. He didn't mind phonographs so much, thought it rather fun if three of four were going full blast in one room. He wasn't apologetic for his tastes. He apologized for only one personal defect, and that was put-

ting sugar in his whisky. This used to make the late Ned Greenway and Charles Yale wonder if at times Sterling really wasn't a little bit eccentric.

Austerity Sterling reserved only for the high art of poetry. From the venerable Ina Coolbrith, doyenne of Western poets, to the youngest versifier in Berkeley, he knew them all, personally or through correspondence. He sometimes mistook peacocks for lordly swans, and declared there was genius when sometimes there wasn't any. His judgment was swayed too readily by sympathy, whether he liked the person or not. Perhaps the last letter he wrote was a painfully indited missive to a New York publisher on behalf of an acquaintance who had something in manuscript. Sterling wasn't sure what it was, but it was a manuscript anyway, and its acceptance might do somebody good.

Whaling was Sterling's passion, and his regret was that he had never once harpooned a whale. Grandfather Sterling, a stumpy, barrel-shaped down-East Yankee from Sag Harbor, had killed more whales than any man that had ever lived. That old man was his first idol. The second was Father John Bannister Tabb, the gentle poet and teacher of classics at St. Charles College, in Maryland, who first taught him to write verse.

It was in 1890 that Sterling first came to San Francisco. He became secretary to his uncle, F. C. Havens, the capitalist. Two years later he began his memorable friendship with Ambrose Bierce, then a columnist on *The Examiner*, who proclaimed to the world the merits of his protégé's "A Wine of Wizardry." From that time on Sterling maintained his rank as one of the finest sonneters of this country. Locally, for familiarity with Sterling—the athlete, boxer, and clubman—forbade illusion, he was regarded as the prop and pillar of San Francisco's Bohemia. It was perfectly true.

Three nights a week at Bigin's old Broadway café, where artists and writers foregathered—and Maud Fulton, later the noted actress, pounded the piano and darned socks and was the young-motherly spirit of the place—Sterling held forth. Sculptors from Paris, novelists from England, playwrights from Vienna, came here with letters to the

patron saint of San Francisco culture. They were greeted, but they were not neglected in favor of less fortunate artists who lived in bare studios along Montgomery Street. They had their bread and wine regularly, so long as Sterling had a dollar left in his pocket.

A saintly, whimsical, vagabondish man, he had a good deal in him of Villon. I have seen him fly into Berserker rages over absurd trifles. Once he had misplaced a Japanese toy—a tiny doll, or something—at a dinner party, and he wept and moaned until it was found. Then at his mother's death he comforted himself throughout the agony with the sweet fortitude of a Christian.

He would sing pæans of hatred over street-cars, the custom of putting garlic in salad, on applie pies, hot desserts, or dominoes, though he liked games and was one of the best chess-players in the city. He was impatient of fools, but very kind to them when they were in trouble.

Three times he quit San Francisco, but the love for the gray and sprawling old city drew him back, and for the last seven years he never left it except to go to Carmel, his second love, where he listened to the wail of the curlew through the fog and indited his mournful poems on the sounding sea.

He was a true pagan, a creature torn by love of beauty and by pain at the human spectacle. He was always at the beck and call of his friends. He was part of the soul of San Francisco's spiritual and laughter-loving life.

It is impossible to think that he was fifty-seven, and is now dead. Another poet once said of him: "No matter how long he lives, he will die in his thirties; and if he lives long enough he will die in his teens." The prophecy came to pass. He died a glorious Dionysian youth. Those who knew him will mourn and cry, as nature and brute life did when the trembling cry arose, what time the world was young and fresh, "Pan is dead!"

* * *

Lo! when I hear from voiceless court and fane
Time's adoration of Eternity—
The cry of kingdoms past and gods undone—
I stand as one whose feet at noontide gain
A lonely shore; who feels his soul set free,
And hears the blind sea chanting to the sun.

George Sterling

By the Editor

GEORGE STERLING was in his twenty-first year when he came to Oakland in 1890 to work for his uncle, Frank C. Havens, of the Realty Syndicate. Oakland, Honolulu, Carmel, New York, and San Francisco—his life from 1890 to 1926 was lived in these five communities. The important influences were exerted by Oakland, Carmel, and San Francisco.

The formative period was perhaps not quite completed when George came to Oakland. He was born in Sag Harbor New York, in 1869. Speaking of Sag Harbor in one of his latest writings, he said: "It was, and still potentially is, a boy's paradise, and it was in such favorable surroundings that I passed all my years, as far as the twentieth, aside from a few winters spent at school in Maryland."

The school in Maryland where George passed several winters was St. Charles College at Ellicott City, a short distance southwest of Baltimore on the Patapsco River. Here George had as his teacher in English Father John Bannister Tabb. George was never tired of telling how much he owed to Father Tabb, and yet I find that to many who knew George well the name of Father Tabb conveys no meaning.

John Bannister Tabb was born near Richmond, Virginia, in 1845. As a very young man he served in the Confederate navy on a blockade-runner, and was taken prisoner. After the war he studied for the Episcopalian ministry, but in 1872, on the eve of ordination, he joined the Catholic

Church, and began studies for the Catholic priesthood. He was ordained in 1884 by Bishop (afterward Cardinal) Gibbons of Baltimore. The rest of his life was spent in teaching, while the writing of poetry was his avocation. He died in 1909, having been completely blind for two years.

All of Father Tabb's poems were brief and packed with thought, and many of them were pointed with epigram. To find a poet comparable with him in the mastery of much in little one must go back to Herrick.

I have paused on Father Tabb because, while editors like Gilder of *The Century* properly valued him, he is a good deal neglected nowadays — and also because he was the first to perceive that the boy George Sterling had the soul of a true poet. George told me the story. Day after day Father Tabb would come to the play-yard while George was busy playing football or baseball. The priest would bide his time until he

caught the boy's eye. Then he would beckon, and George, no matter how reluctant, would obey the summons. He knew what was coming. "Take this, George, and memorize it. When you have it by heart, come and recite it to me. Then you can go back to play." One day it would be Keats' sonnet on Chapman's Homer, another day it would be part of Shelley's Skylark, or it might be a poem from Wordsworth or Tennyson. In this way Father Tabb awoke the boy's soul to the beauty of words, stored his mind with masterpieces, and nurtured the

BEYOND THE TIDES

BY GEORGE STERLING

*The flood of thy waters, Life, gathers me
under;
O'er my head the waves of thy sea trample
in thunder.
Star after star is gone, from the heavens
falling;
The years that were have taken the voice
of a dreadful music calling.*

*There comes not any to aid, and I strive
the prouder,
Torn by billow and angry wind where the
surf grows louder,—
Swept to the sands where the foam of
an ocean reaches,
And cast like drift that an ocean leaves
on the verge of its lonely beaches.*

*With the rose of thy kisses, Love, bless me
and blind me!*

*Hide me far in a secret place where none
may find me!*

*Kneel by me! Grant me the grace of thy
tender weeping,*

*Then say farewell and leave me alone for
a thousand years of sleeping!*

gift that was to flower so beautifully, but which only a genius like Father Tabb could suspect in a child. It was years before George realized the full meaning of Father Tabb's procedure. In his very first book he has these verses, entitled "Reading the Poems of Father Tabb":

"So airy sweet the fragile song,
I deemed his visions true,
And roamed Edenic vales along,
Lit by celestial dew.

"Illusive gleamed the timeless bow'rs;
The winds and streams were such
As Eve had mourned—
but ah, the flow'rs!
Too delicate for touch!"

George had no intention of becoming a poet when he first arrived in California. He devoted himself seriously and efficiently to the real-estate affairs of his uncle's office. But he made friends among writers and artists, and gradually he began to understand what was his proper life-work. In Oakland he met Joaquin Miller, Herman Whitaker, Xavier Martinez, Jack London, and Ambrose Bierce. In Oakland, in 1896, he was married. After the marriage the Sterlings spent some time in Honolulu. It is permissible for one who knew George well, and knew Carrie Sterling also, to say a word about their marriage. It lasted for some fifteen years and brought both of them a great deal of happiness.

Just how early Joaquin Miller's poetry came into George's life we know at first hand. In his charming essay on Miller in the *American Mercury* George told how he and Roosevelt Johnson sprawled under a wild-cherry tree at Sag Harbor and read "Songs of the Sierras." And how, when Roosevelt Johnson arrived in Oakland a year after George, his first question was: "Have you gone to see Joaquin Miller yet?" The two boys made the pilgrimage together, and for George it was the beginning of a lasting friendship. Nobody in America had a

sounder appreciation of the worth of Joaquin Miller's poetry, nor a more balanced understanding of his amiable strength and his amiable weakness.

Jack London, from those early Oakland days to his death in 1916, exercised a strong influence on George Sterling. Jack, as we all know, found his true footing in life with the assistance of Ina Coolbrith, and I like to think that the reverence and affection in which George always held Miss Coolbrith were deepened by his knowledge of what she had done for Jack. As London influenced Sterling, so Sterling influenced London. It was the mutual influence of a very strong, close friendship. It has always seemed to me that London was the dearest to George of all his friends. George was the only person not related to Jack who was privileged to be present when Jack's ashes were entombed in the Valley of the Moon.

But of course the strongest literary influence of those early Oakland days was Ambrose Bierce, whom Sterling first met in 1893. Of that influence George has written: "From the

beginning of my poetical efforts, I had been accustomed to submit to his criticism all that I wrote, and though he has been accused of laying a hand of ice on my muse, I can testify that he gave of his counsel generously and with acumen. . . . However, the day was to come when I could not assent to all his æsthetic suggestions. When my unwillingness began unmistakably to show itself he was not without evidence of pique. And yet he, who seldom found occasion for unconditional praise, could give it, and in my instance did give it, freely and to excess. But in almost all cases his praise bore a tonic element; when he gave honey it held a tincture of quinine. In view of the modern movement in poetry, he was not, perhaps, the best master I could have known, but I cannot look back to the days of my appren-

HOMeward

BY GEORGE STERLING

*O Paths of stone, whereon the weary stray
From toil to toil, from sin to tawdry sin—
Farewell awhile! The silences begin
To call me to my kingdom far away.
There sings the lark to welcome back the day,
And there the poppies in the moonlight thin
Invite to dream, and there the pine-boughs
win
A fitful music from the wind's delay.*

*Farewell! I hasten to the sapphire South,
There to be lonely till my goddess come
To blind me with the kisses of her mouth;
And I shall wander where the cypress broods,
And listen as the bees of Carmel hum—
A faun again in sacred solitudes.*

ticeship without feelings of gratitude. Also I have come to agree with many of his suggestions that I once rejected."

George's first book, "The Testimony of the Suns," was dedicated to Bierce, and through the years that followed he found many occasions to sing and speak in admiration and defense of his master. And when a selection of Bierce's letters was published by The Book Club of California in 1922, it was George who wrote the prefatory memoir. We learn there that Bierce's criticism saved the youthful poet from publishing many an immature attempt.

Those Bierce letters give us many bright little insights into the progress of a poet beginning to try his wings. In 1901 we find George making his first acquaintance, at Bierce's suggestion, with Stedman's American Anthology. We find Bierce instructing him in the various rhyme schemes of the sonnet. We find him introducing George to Roget's "Thesaurus." We find Bierce getting his "Memorial Day" published in the *Washington Post*—in all likelihood the first publication of a Sterling poem.

A year later Bierce is writing from Washington to say that George is advancing in poetry "at a stupendous rate." Bierce has just read the "Testimony of the Suns" in manuscript. "I dare not trust myself to say what I think of it. In manner it is great, but the greatness of the theme!—that is beyond anything." When the book appeared in 1903 his praise was more significant, because he had read and reread the "Testimony" and found it greater than he had thought it in manuscript.

By January, 1904, Sterling was writing "A Wine of Wizardry." Bierce writes to him: "You whet my appetite for that new poem. The lines

'The blue-eyed vampire, sated at her feast,
Smiles bloodily against the leprous moon'

give me the shivers. Gee! they're awful!"

A little later he received the completed poem, and wrote to George: "I hardly know how to speak of it. No poem in English of equal length has so bewildering a wealth of imagination. Not Spenser himself has flung such a profusion of jewels into so small a casket. Why, man, it takes away the breath!"

Bierce submitted it to *Harper's Magazine*, the *Atlantic*, *Scribner's*, *The Century*, the *Metropolitan*, and *Booklovers'*. All rejected it. It finally saw the light in the *Cosmopolitan* in the summer of 1907. In the same issue there was a critique by Bierce beginning: "Whatever length of days may be accorded to this magazine, it is not likely to do anything more notable in literature than it accomplished in this issue by the publication of Mr. George Sterling's poem, 'A Wine of Wizardry'." It is not necessary to follow the history of that great poem. It carried George's fame across the Rocky Mountains, "whose passes," as Bierce says, "are so vigilantly guarded by cismontane criticism."

It was in 1905, I think, that Sterling moved to Carmel. Monterey he had already been taught to love by Charles Warren Stoddard and Charles Rollo Peters. If I am not mistaken, it was Rollo Peters who gave him the thought of moving to Carmel. George was second of all the Carmelites, Mary Austin alone having preceded him. He lived there continuously for at least six years, and frequently returned afterward. Of the influence Carmel exerted on Sterling's poetry it is enough to say here that if you subtracted the inspiration of Carmel from his published volumes, you would take away much of his most significant work. It is not too much to assert that without Carmel George Sterling would have been a different poet from the one we came to know and value.

THE QUEST

BY GEORGE STERLING

*O you that pass, O you that come and go,
How far is the horizon at the end,
As mocking sky and barring ocean blend
In mystery, and Time's brief afterglow
Is on the Islands we shall never know,
And alien are the stranger and the friend!
What peaks are those we dreamt we should
ascend?
What seas, where soon the winds of night
shall blow?*

*I too am of your throng, O passers-by!—
This changing hope and memory that is I,
This sense of hunger that we call the soul.
I too have sought and questioned and have
found
Only that sky-line whose mirages bound
The many wanderers and the single goal.*

Carmel's debt to George Sterling is just as great. The late Frank Powers discovered Carmel, but George made it known throughout America. Distinguished men and women went to visit him there, and departed enthusiastic about its natural beauty. George often said that the writers of Carmel were overrated and its scenery underrated. "You get so used to this pea-soup bay," he said to me, referring to our harbor, "that you forget what blue water is like." At Carmel George went back to sports of his Sag Harbor boyhood. He hunted, fished, walked, and swam. He was a strong swimmer, passionately fond of the water, and to my mind "Beyond the Breakers," an ecstatic celebration of swimming, is one of his finest poems.

Some time after returning from Carmel to San Francisco George went to try his fortunes in New York. "Now that I have got what has been called 'the poison of art' out of my system, I shall try some prose, some short stories," he said. He stayed in New York about fourteen months, and was glad to return to San Francisco. He had

not the knack of writing stories, although his mind was fertile in the devising of plots which he passed along to Jimmy Hopper, Harry Leon Wilson, and other friends. Some may recall a very striking story of Wilson's called "The Boy Who Counted a Million"—it was based on an experience of George's at Sag Harbor.

In his late years in San Francisco George began writing prose—and very fine prose it was indeed. In 1913 when General Lucius Harwood Foote died, George wrote at my request a critique of his poetry. It was, I think, the earliest critical work he did, and if so it had the importance of a first step along a literary path that he learned to tread with sureness and distinction. His appreciation of Clark Ashton Smith, his essay on the modern trend of poetry, his tribute to

Yeats' "Lake Isle of Innisfree," his delightful essays on Bierce and Miller, and his posthumous article on Robinson Jeffers remind us that the best poets frequently write the best prose.

It is a characteristic not to be overlooked in estimating George that very much of his prose was concerned with the praise of other poets. A great many poets lack either the time or the inclination to celebrate their fellows. Not so with George. He had a most generous attitude toward all of those who

were trying to express themselves in his own medium. Many hours that might have been given to creative work he devoted to reading manuscripts and to seeking that something—it was often a very little something—which would permit him to write a word of encouragement to the beginner on Helicon.

He was a deep and all-consuming reader, and in particular of poetry. He knew more about the English-writing poets—great and humble, classic and contemporaneous—than any other man I ever met. He had traced all

the streams of California poetry from the beginning, and to hear him speak of Pollock, Stoddard, Harte, Miller, Miss Coolbrith, Bierce, Ridge, Realf, Sill, O'Connell, Foote, Robertson, Josaphare, Binckley, Gibbs, Scheffauer, and all the rest down to Jeffers, was to realize very vividly that California poetry might boast a tradition and a significance worthy of study. He of all men might have written the critical history of California poetry. In many places, in dealing with many names, he would have transcended his subject—but that is true of all great critical studies of poetry—and there would have emerged from his work not only a true understanding of the poets we have had, but a definite inspiration for our Californian poets of tomorrow.

To the poets of [Concluded on page 13]

TO PAIN

BY GEORGE STERLING

*Sandalled with morning and with evening
star,*

*Draw near me, Lady of ascendant pain,
Whose hair has touched me in the twilight
rain,*

*Whose home is where unchanging faces are.
You wait me where immortal feet have trod,
And in your voice is music not-to-be,
And in your eyes the night of mystery.
Old as the silence on the lips of God.*

*There is no treason in your given word.
Your love is past all love, all vain delights,
And holy is the music I have heard.*

*'Tis not the Cytherean that shall lead
To stranger seas and unimagined heights,
Nor stand in flame beside me at my need.*

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COMPLETED in record time, the new million-dollar San Andres pipe-line of Spring Valley Water Company was brought into service at the beginning of July, when twelve million gallons of water from Lake San Andres flowed through it for eleven miles to the Laguna Honda distributing reservoir. In spite of rain and traffic difficulties encountered within the city, the line was finished in four months' actual working time.

The pipe-line is of steel fifty-four inches in diameter and has a capacity of thirty million gallons daily. It was made in San Francisco by the Western Pipe and Steel Company and contains 7800 tons of steel plate. The Youdall Construction Company excavated 96,790 yards of earth to receive the huge pipe. Between Lake San Andres and Baden the Company had to purchase 18,000 feet of right-of-way. At the lakeside the pipe pierces a tunnel 800 feet long.

Spring Valley Water Company now has pipe-line capacity into the city of eighty million gallons daily, as against fifty million gallons daily before the new line was completed. There were several days in June when the city used fifty-five million gallons of water, or five million more than the capacity of its pipe-lines at that time. So the completion of the new line is very timely. It will improve pressure conditions over a wide area, as Laguna Honda Reservoir, where the line terminates, supplies one-half the population of the city. The line was planned and built under direction of George A. Elliott, Chief Engineer.

The Railroad Commission recognized the pressing necessity for this line and formally authorized it. It gives Spring Valley great satisfaction to have it completed in time to meet the situation which was foreseen. The

Company realized that it would be needed in July, and therefore pressed the work to its conclusion.

* * *

George Sterling

[Continued from page 12] California who began to test their singing qualities during his time, he hearkened very attentively. It never occurred to him that the youngster just raising his voice in song might be a competitor for his own laurels. George knew he was a poet—he took his poetry very seriously—but he never dreamed of laurel. There was in him no vanity of achievement. For him the poets were a brotherhood—he reached out an eager hand to welcome a new singer. That poets like Christian Binkley, Ralph Gibbs, Flora McDonald Shearer, and Nora May French died before finding complete utterance was to George a very real tragedy. He made Clark Ashton Smith articulate, and found for him those paths of encouragement that the inspired Auburn boy would never have found alone. He was so whole-heartedly pleased when Robinson Jeffers commanded an audience after years of effort that he could not bring himself to express publicly his instinctive disapproval of the themes which finally drew attention to this strange, powerful singer of Carmel.

Let Sterling's poetry be—our children and our children's children will have their say about it. Our estimate is unimportant. But we turn naturally to his poetry to express him in terms of what he means to us, and I think of those lines he wrote in his noble "Ode to Shelley," lines inscribed upon Spring Valley's memorial, lines so true of George himself:

* * *

ON the slope of a San Francisco hill, surrounded by shrubs and flowers, is the latest memorial San Francisco has erected to one of its literary sons. The George Sterling memorial bench is not in a city park and does not speak of an official recognition of his place in letters. It is a larger tribute, it seems to me, because it is a natural one, from the hearts of friends. All in all, perhaps, there is no memorial anywhere just like this, for the men who gave it are of the group commonly called hard-headed followers of big business. By them Sterling, the symbolic, high-soaring poet, was dearly loved. Does it mean he spoke a language to be understood by the practical, or that there is a wealth of poetic appreciation in many men associated with industry. Follow Sterling's career, note the friends who were his, and you will find him moving simply with the bare-elbowed Bohemian and the square-jawed captain of industry. He did not ask for labels and he did not judge by the ordinary standards. Maybe that is the secret of his popularity—maybe that is the reason that in the Spring Valley's property, close by a reservoir which reflects the trees and the sky, is the memorial to the singer who has fled afar.—Oakland Tribune.

An Authentic Poet

By Willard Huntington Wright

[*S. F. Bulletin, May 19, 1918*]

THE American Philistine's idea of a poet is a man who wears his hair to his shoulders, who dresses in black, baggy clothes which shine scintillantly at each anatomical angle, who drinks green absinthe, who adorns himself in a flowing Elbert Hubbard tie reaching to the pants' line, who lives in an attic lighted by a candle inserted in a wine-bottle, who is too lazy to work and has taken up poetry in order to avoid more strenuous labor, who is something of a lunatic and a good deal of an egotist, who is utterly lacking in even the most rudimentary practicality, who tends toward effeminacy, who spends most of his time gazing rapturously into the interstellar spaces, who believes in free-love and wears tortoiseshell glasses. Such is the poet of bourgeois fable.

But the authentic poet is quite a different being. Regard George Sterling, for example. He has none of the characteristics, habits, or practices of the imaginary poet recorded above, except that he might, on occasion, be induced to partake of absinthe. He lives at a fashionable club, patronizes the barber regularly, eats lavishly and well, has experienced the conventionalism of marriage, dresses like his fellow men, and might, in a pinch, pass for a bank cashier.

Sterling, withal, is one of the most capable and talented of modern poets. He stands in the front rank of American prosodists, and his presence in San Francisco has added no little fame to this city. His name and his verse are known to every book-lover in the country, and the circle of his friends and acquaintances is very wide, for he has not only the capacity for friendship, but the colorful nature and the attractive personality which draw people to him and hold them. The Bohemian Club would have to change its name should Sterling resign from membership.

It is difficult to portray in words a man as complex and volatile as Sterling. His char-

acter is at once simple and intricate. He has his superficial side, but this is not the real Sterling; and even this interior is made up of a multiplicity of details. He is a paradox in many ways, and to say that he is full of the most amazing contradictions is only to hint at the strange and varied combinations which go to make him up.

In Sterling's ancestry we find an explanation for this intermingling of diverse elements. On his maternal side he comes from a long line of buccaneers, seafarers, and fighters. His grandfather was Wickham Havens, the famous whaler, who had a record of 965 big whales. (The hundreds of small whales which fell victim to his prowess he did not deign to tabulate.) There was vitality, adventurousness, and general cussedness in this branch of his heritage.

On the other hand, his paternal forefathers were clergymen and lawyers and educators. They were purely of intellectual stock, with no stomach for harpooning whales or hunting wild game. Sterling is an amalgam of these two hereditary factors. The former gave him his strength and vitality, his robustness and love of the sea and the outdoors. The latter conferred on him his intellectual leanings, his sensitivity to beauty, and his instinct to create literature.

Sterling was born at Sag Harbor, L. I., nearly fifty years ago; but it is impossible to think of him as anything but a very young man. He has the nature, the instincts, the mind, the enthusiasm, and the appearance of youth. No matter how long he lives, he will die in his thirties; and if he lives long enough he will die in his teens.

Sterling looks like a youthful Dante. He has the profile and the head that are placed on the Dante busts which the Italian clay-workers back East carry from door to door in baskets. His eyes are green and mellowed with a constitutional good nature; and his eyebrows are thick and on the point of be-

coming shaggy. His hair, once dark brown, is beginning to turn gray. It, too, is thick and has a natural marcel, despite its irregular and at times unkempt condition. A sort of bang, profuse and circular, habitually covers a broad, flat and precipitously sloping forehead. His mouth is a little full; his chin narrow and square; and his ears are small and set close to his head.

Sterling's nose, however, is the most conspicuous and individual of his features. It is very narrow, and, though pointed, has a decided Roman cast. Furthermore, its general direction is almost vertical. It is an unusual nose, highly sensitive and distinctive, and goes far toward achieving his good looks. For Sterling is handsome; even his enemies and creditors would admit that fact. But his is not a smooth, oval handsomeness, of the kind we are apt to associate with poets. Sterling is handsome in a rugged classical sense. There are archaic Greek heads for which he might have posed.

As to dress, Sterling is an eclectic. But, in any event, he is non-poetical in his sartorial selectiveness. He wears stiff collars and four-in-hand ties of a somewhat gay coloration. His shirts are of silk, and they are adorned, as a rule, with fancy—though not too fancy—patterns. His suitings are quiet, with a leaning toward grays. Only in his vests does one sense the touch of eccentricity. These vests have an almost actorial atmosphere about them; they are light and gay, taped along the edges, and cut in a rather low V.

Sterling was educated in the public schools of San Francisco, and at St. Charles College,

Ellicott City, Md. He took no degree—a fact of which he is a little proud. Indeed, he was constantly on the point of being expelled for one deviltry or another. And much of this diablerie remains with him today, taking the form of hilarity and play. He likes to dance, is fond of masquerades and gay gatherings,

and finds enjoyment in all manner of pranks. There is much of the eternal boy in Sterling—the boy's impulsiveness and spontaneity, the boy's care-free and inconsequential spirit. He possesses the instinct and capacity for having a good time, and takes few things seriously.

For twelve years after leaving college he was secretary to his uncle, having immediately come to California when out of school. In 1908, when he was receiving one hundred dollars a week, he threw clerical work to the four winds, moved to Carmel, and settled down to the business of being a poet. And not only did he become a poet and help give Carmel its fame as a hotbed of literary activity; but he soon became one of Carmel's centers of attractiveness and the generalissimo of the anti-Puritan faction of that community. In fact, it was Sterling who kept the eminently respectable literary ladies

who lived there in a constant state of psychic and physical shock. And it was Sterling who gave Carmel its reputation as a wooing center. It is now a blameless hamlet.

But all the time he was seriously writing good poetry. His first book, "The Testimony of the Suns," appeared in 1904, and Ambrose Bierce was the first man to recognize its undeniable merits. But it was not until

THE MASTER-MARINER

BY GEORGE STERLING

*My grandsire sailed three years from home,
And slew unmoved the sounding whale:
Here on a windless beach I roam
And watch far out the hardy sail.*

*The lions of the surf that cry
Upon this lion-colored shore
On reefs of midnight met his eye:
He knew their fangs as I their roar.*

*My grandsire sailed uncharted seas,
And toll of all their leagues he took:
I scan the shallow bays at ease,
And tell their colors in a book.*

*The anchor-chains his music made
And wind in shrouds and running-gear:
The thrush at dawn beguiles my glade,
And once, 'tis said, I woke to hear.*

*My grandsire in his ample fist
The long harpoon upheld to men:
Behold obedient to my wrist
A grey gull's-feather for my pen!*

*Upon my grandsire's leathern cheek
Five zones their bitter bronze had set:
Some day their hazards I will seek,
I promise me at times. Not yet.*

*I think my grandsire now would turn
A mild but speculative eye
On me, my pen and its concern,
Then gaze again to sea—and sigh.*

"A Wine of Wizardry" appeared that Sterling came into his own. This poem was published in *The Cosmopolitan*, and it sold out the whole issue in two weeks. It was Bierce, again, who told the country what a great poem it was; and gradually the sluggish critics began to awaken to the fact that a new poet of a high order had appeared on the Western horizon.

Since then, Sterling has written constantly and has issued many books of poetry. The bulk of his poems, however, have never been published. They are the personal and intimate expressions of his amatory adventures and emotions, and are to appear after his death. Recently he has taken to writing drama, and his "Lilith," a four-act dramatic poem in seventeen scenes, is to be published in the autumn.

Sterling's best friend was Jack London, and London's best friend was Sterling. Of this friendship Sterling is prouder than of any other event in his life; and he likes to tell of his introducing London to the alcoholic pharmacopœia. When Sterling met London, the latter knew only rum, gin, whisky, and beer, regarding claret as a refinement and port wine as effeminate. Sterling, a connoisseur in beverages of all kinds, and an expert in febrifuges, proceeded to initiate London into the mysteries of obscure, rare, fancy and complicated potatoes.

Sterling, as I have said, is a curious mixture of qualities. He is something of a barbarian, and I once referred to him in an article as a "wassail bard." But his intellect is highly refined, and his poetry has an air of subtle erudition and finish such as is rarely found in American verse. Again, Sterling cannot resist the lure of Bohemia, and his evening headquarters is Bigin's Bologna restaurant, the center of the spaghetti-and-wine circuit. But, unlike every other Bohemian in Christendom, Sterling is a lover of sports, exercises constantly and walks miles every day. His favorite sport is swimming, and he is an excellent amateur boxer and athlete. . . . Reconcile these facts if you can!

And Sterling's nature is quite as contradictory as his instincts and habits. He is the mildest of men and the most generous of companions, yet he has bitter enemies. As one of his closest friends said: "He is in-

capable of hate. If his worst enemy should be hungry George would give him his last cent." And yet he is capable of inanimate hatred. He will soar into a Berserker rage over some trivial thing. He regards dominoes as the vilest game ever invented by men. And his pet aversions are Puritans, the Sutter-street car line, professors of English literature, mysticism, rhubarb pie, women who leave powder on his lapel, popular songs, water, the *Saturday Evening Post*, hot deserts, free verse, pro-Germans, and the Sausalito ferry. When thinking of any one of these things he flies into a state of passionate hatred.

Sterling, after fourteen months in New York, shook Carmel from his system forever and settled in San Francisco. He has been living here for years, and has a deep love for the city. He intends to write a long poem about San Francisco which will, in a way, be its literary monument. I don't think anything could entice him away from the city. He has become a part of its life and has taken on its color. And San Franciscans have a right to be grateful for this gift, for Sterling is one of our great poets.

To Remember George Sterling

[Continued from page 3] Harry Howland, Miss Pauline Jacobsen, Mrs. Annie Laurie, Austin Lewis, Mrs. Guy H. Liliencrantz, Mrs. Charmian K. London, Mr. and Mrs. Xavier Martinez, Gabriel Moulin, L. C. Mullgardt, Mr. and Mrs. Athol McBean, John McLaren, Mr. and Mrs. J. H. Nash, Mr. and Mrs. Haig Patigian, Gottardo Piazoni, Mr. and Mrs. Roy Pike, Mr. and Mrs. Richard Prosser, Joseph Redding, Dr. Aurelia Reinhardt, A. M. Robertson, Harry Robertson, Mr. and Mrs. George Rolph, Ot-tarino Ronchi, Mrs. F. W. Rounthwaite, Edward F. Schneider, Rudy Seiger, Dr. J. Wilson Shiels, W. H. Smith, Jr., Mrs. Frank Spring, Mr. and Mrs. Dan Sweeney, Henry H. Taylor, Mrs. Rose Travis, James Tufts, Mr. and Mrs. Uda Waldrop, Carl I. Wheat, C. E. S. Wood, Mr. and Mrs. W. R. K. Young.

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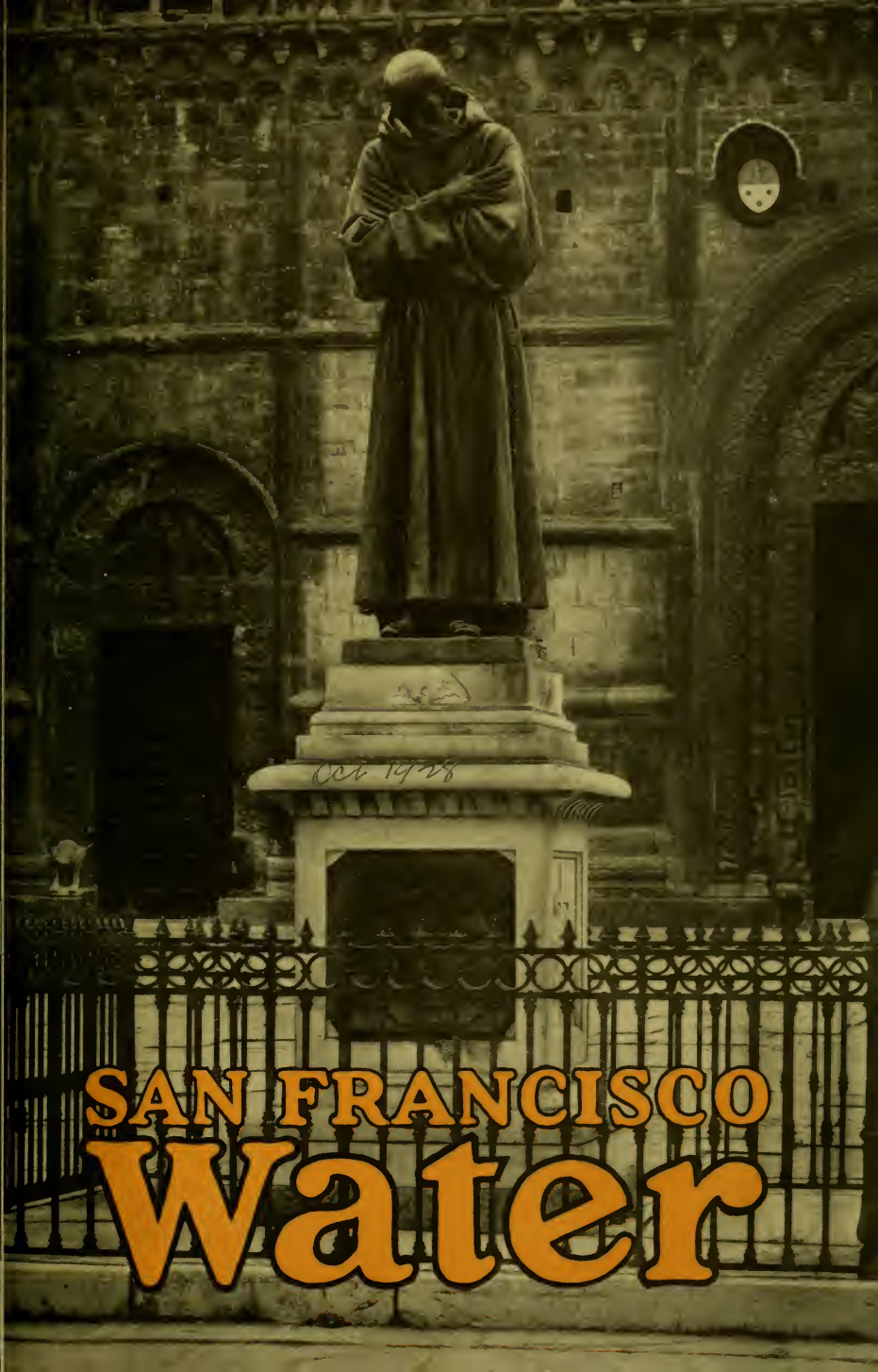
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SINGER, FLED
AFAR!
THE ERECTED
DARKNESS SHALL
BUT ISLE THE STAR
THAT WAS YOUR VOICE
TO MEN,
TILL MORNING COME AGAIN
AND OF THE NIGHT
THAT SONG ALONE REMAIN.

From Ode to Shelley

BY GEORGE STERLING



Oct 1928

SAN FRANCISCO
Water

O MOST MIGHTY, omnipotent, and good Lord,
To Thee belong praise, honor, and all benediction!
To Thee alone, Most High, are all these due.
There is no man worthy Thy name to speak.
Praise be to Thee, my Lord, with all Thy creatures!
Especially for Messer Sun, our brother,
Who gives us light in the day;
And he is beautiful and radiant with great splendor.
Of Thee, Most High, he is the sign.
Praise be to Thee for Sister Moon and the Stars,
Which Thou madest for heaven, clear, rare, and beautiful!
Praise to Thee, my Lord, for Brother Wind,
For air and clouds, for quiet time and stormy,
By which Thou dost sustain all Thy creatures!
Praise to Thee, my Lord, for Sister Water,
Useful and humble, and precious and chaste!
Praise to Thee, my Lord, for Brother Fire,
Who lightens up the night,
And is handsome and joyous and robust and able!
Praise to Thee, my Lord, for our sister and mother,
The Earth, who brings forth varied fruit and herbs, bright-hued,
Who sustains and keeps us.
Praise to Thee for those who forgive for love of Thee
Sustaining afflictions and tribulations!
Blessed be those who keep themselves in peace!
By Thee, Most High, will they be crowned at last.
Praise to Thee, my Lord, for Sister Death,
From whom no man can flee!
But woe to those who die in mortal sin!
Blessed are those who do Thy most holy will!
To them the second death can bring no evil.
Praise ye, and bless my Lord, and thank Him, and serve Him
with great humility!

Canticle of the Creatures

BY ST. FRANCIS OF ASSISI, A. D. 1182-1226

SAN FRANCISCO WATER

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A Plea for a Statue of St. Francis

By the Editor

OCTOBER fourth is the feast day of gentle St. Francis of Assisi, and therefore too the special feast day of our city of San Francisco, which was named in his honor. It seemed fitting, therefore, to devote considerable space in this October issue of *SAN FRANCISCO WATER* to the holy man of the thirteenth century who has been called "Everybody's Saint Francis," but who is, in a special sense, our Saint Francis.

And why not seize this occasion to renew the plea so often made by Bishop William Ford Nichols of revered memory for a statue in San Francisco of San Francisco's patron saint? Bishop Nichols never tired of putting forward that suggestion, and he urged it with gentle but special force during that period of artistic awakening that preceded the opening of our great World's Fair. Bishop Nichols was a great citizen as well as a great churchman. The influence of his character and personality left San Francisco a better city than he found it. Doubtless he would have had his way in this matter of a statue for Saint Francis had not the energies of his later years been centered, perforce, upon that great cathedral program that is now going happily forward under his distinguished successor in the episcopate.

Bishop Nichols' vision was of a statue of heroic size crowning Lincoln Park and breathing a benediction upon travelers coming to us from the Orient. It was a Vision Splendid, and should not be permitted to fade away. We have great sculptors here, and unless we have been misunderstood, we

have that sense of spiritual values that gives a community a soul.

The beautiful statue of St. Francis shown on our cover is known to all who have visited the Umbrian town of Assisi. It is, of course, exclusively religious in its feeling—its appeal is to the devotional side of human nature. This is not the sort of statue that Bishop Nichols desired in San Francisco. He imagined St. Francis holding aloft a beacon to symbolize "Character Enlightening the World." It was a sound civic conception. It would command the respect of all citizens and all travelers, no matter what their form of religious worship, for Francis of Assisi is universally accepted as one of the principal figures of modern civilization.

All San Franciscans must know the story of how, when Padre Junípero Serra mentioned to de Galvez that no California Mission had yet been named in honor of the Franciscan founder, the general replied with a smile: "If St. Francis wants a mission named after him, let him lead us to his port." The port of St. Francis was found, and the landmark that we call Mission Dolores is more correctly the Mission of St. Francis of Assisi. It was solemnly dedicated on the feast day of its patron in 1776, five hundred and fifty years after his death.

Shall we add a very special plea? It is written of St. Francis that he so loved the loveliness of water that "whenever he did wash his hands, he would make choice of such a place, as that the water which fell should not be trodden by his feet."

The Birthplace of St. Francis

[From "Some World-Circuit Wanderings," published in San Francisco, 1913]

By Bishop William Ford Nichols

YOU see Assisi long before you reach it, and it has an interest, aside from its association with St. Francis, in that it is typical of those Italian towns which, like individual castles, were built on commanding eminences for purposes of defense and good sentineling against neighboring towns which might have unneighborly invasion and loot in mind upon occasion. And the history of Assisi is troubled with the record of such visitations from Perugia and other points, to say nothing of passing armies from afar. Again and again has the hill which the modern traveler climbs to reach Assisi had its steep slopes trodden by the feet of attacking foes, who were often repulsed, sometimes successful, but always found the natural defenses of the heights formidable, and once, at least, were only able to gain entrance by making use of an exposed city drain.

It is, however, not the town's site, but the town's Saint, that draws thither the greater number of people who go there from all parts of the world. The register of the Hotel Subasio shows many names from California and San Francisco, but the wonder is that many more from the state dotted with the names and prizing among its traditions and exhibits the Missions of the Order of St. Francis, do not make it part of their itinerary abroad to go to Assisi. And surely no San Franciscan who feels the indefinable charm and spell of his city would willingly forgo the opportunities to see the birthplace and home of the Saint after whom the city is called. For it need raise no clash of controversy to waive all questions about which men differ as to the cult or legends of the Saint, and to recognize his high and holy character and the acknowledged sway of his power for good upon his generation, and indeed, as some estimates of it by those not of his own communion do not hesitate to say, upon the modern world. Take this, for example, from a Church of England writer, Canon Knox-Little, in his Lectures on St. Francis of Assisi: "One of the matters of keenest interest in St. Francis is the way in which his

dential order for fashioning and forwarding the civilization of the West."

"Francis felt, under the teaching of the Holy Spirit, that men needed a fresh start; he saw and felt also that as in the first age so in the opening of the thirteenth century, nothing could give that fresh start but real reproduction and presentation before their eyes of the life of Jesus Christ. It is this which marks him after St. Paul probably the most remarkable missionary and apostle that the world has ever seen." Matthew Arnold says of him: "He brought religion to the people." And citations of like large and discriminating tribute might be made from other writers who would be far from "seeing eye to eye" in all that has grown around his ardent cult. Suppose we take, if you please, nothing more than a citizen's view of the vital need of righteousness and reality of self-forgetful service to our fellowmen, that sense of a municipal ideal would be well embodied in a worthy memorial of our city's Patron Saint, like those statues in the Acropolis of old, colossal and majestic on some commanding height. What better feature could there be for the Panama-Pacific Exposition of 1915 than the unveiling of a monument of that character? It would stand for the sentiment that, however far we are from its realization—and all things considered, we ourselves, to say nothing of the opinions of kind friends elsewhere who read scare-heads about our city doings, would hardly feel that we have yet anything like a municipal "halo" claim—we do have an ideal. Of all the exposition of world welfare at a world's fair, we still believe the prime exhibit must be the sort of humanity the age can show. Let the Golden Gate, as well as "The Narrows," have its symbolic figure at a portal of our country. If our national metropolis has "Liberty Enlightening the World," why not at the new era of the greatest ocean of the world, as it opens out to history-making between the Orient and Occident that is almost beyond the dream of men today,—why not have a new kind of flamen grasped by St. Francis' hand to sig-

nify "Character Enlightening the World"? It would give a high "world genius" to the whole Exposition.

All this, of course, is a digression from travel—or rather, a traveling home in thought, which is, after all, really anything but a digression to a world-wanderer. But as it comes from a zest in the matter freshened by the visit to Assisi, so it may point the purpose of some reader not to pass by Assisi the next time he goes abroad, if he has not already been there.

After leaving the train and before going up the ascent to Assisi proper, the guide takes you to the scene of some of the most notable events in the career of St. Francis. The Portiuncula is the name given to the little sanctuary where St. Francis received the call to the religious life, where he founded the Order of Friars Minor, where he founded the "Poor Clares," or Order for Women under S. Clara, and where he resolved to found what is known as the "Third Order," for those not cloistered. The small stone shrine known as St. Mary-of-the-Angels has been embellished richly with mosaics and dowered with costly lamps and other offerings and is said to go back in its origin to the middle of the fourth century, and St. Benedict in the sixth century is credited with its enlargement—then finally having its restoration by St. Francis' own hands at the beginning of the thirteenth century. It seems all the more minute because over and around it and dwarfing it stands the great church—the "majestic cupola" of which is directly over the Portiuncula—built by Pope Pius V in 1569. This church also encloses the cell, converted into a chapel, in which St. Francis died. And in the adjoining garden there is a third sanctuary built over the hut which St. Francis usually inhabited.

These and other interesting memorials on the heights of Assisi seem to be free from those doubts of identification which sometimes one finds so hard to dissolve in the quest for genuine antiquity. And so you take the card the kind monk gives you, believing that the bits from shrine, door or cell, pulpit and garden, tiny as most of these bits are, are "the real things."

Going up the grade the drive opens out fine vistas of the surrounding country, including the outlines on the distant hill of the

old-time rival and assailant, Perugia, left for the morrow's visit. The old Convent of Santa Clara is first shown not materially different from its appearance in her time, though now occupied by some of the Brothers, the Sisters having their larger convent, to which we next went. There it is an experience unique, with mixed impressions, to be led silently down into a dark crypt deep in the earth where a Sister, half-hidden in the gloom, with her mien well in keeping with all the surroundings, soon reverently adjusts lights so that suddenly illumined before your eyes, lying habited in her coffin, is revealed from its side behind glass what is left of the mortal body of Santa Clara, laid to its rest between seven and eight centuries ago. Leaving that and passing an old Temple of Minerva as a reminder of still remoter centuries, you soon find yourself at the door of the great upper Church of San Francisco, awaiting the coming of the English-speaking Brother who is to act as guide. Adapted to the contour of the hill, and as the first Gothic building in Italy, as is claimed, are the two churches, one above another, known as the Upper and Lower Churches. With Lady Lina Duff Gordon's excellent little handbook on Assisi, one could intelligently spend much time over the frescoes by Giotto and Cimabue as well as over other treasures, though in the dim light good eyesight is needed as well as good guidance. The main motif, however, is the visit to the tomb of St. Francis, and that has in itself a singular history. At the time of his burial service there was a fear that a rival town might attempt to possess itself of his remains in order to have the prestige of ownership and so of the cult of the Saint. So serious was the anxiety that those in authority caused the coffin to be abducted during the burial ceremonies and to be secretly deposited, no one except those immediately effecting it knew where. The resting-place was so effectively hidden and the knowledge of it so confined to those who carried it with them at their death that for several centuries the spot was unidentified. Finally due authority was given for excavations in order to ascertain if possible where the body was. For a long time the effort was fruitless, and was indeed temporarily abandoned and even interdicted by papal authority. But later such authority was renewed with the result that about six centuries after

the interment, that is, in 1818, the body was discovered under the church. By many steps you descend to the cave-like room now excavated and elaborately adorned as a chapel, in the center of which has been left as placed the sarcophagus containing the remains of St. Francis, in itself of simple massive stone and of worthy design. It is a place to linger and thank God for the good examples of His saints, and especially of St. Francis.

In the sacristy are preserved various carefully guarded articles treasured up for their use by St. Francis—the tunic worn by him at his death, charter of the Order of St. Francis, which he often wore about his body, his hair shirt and cord. And there on parchment was the only bit of autographic writing extant of St. Francis, a copy of which, in facsimile, the Brother gave me. It is the Aaronic blessing, written in his Latin script, with his signature, and with an explanatory annotation added later. It might well find

place on any municipal monument in San Francisco of the sort referred to above, to stimulate a spirit in our citizenship to be worthy of his perpetual benediction.

There seems to be something of an historical iteration of the name "Francis" in California. In 1579 came hither the hardy explorer, Francis Drake, with his ship Golden Hinde, and with him Francis Fletcher, the chaplain, held in honor among us. But one who visits Assisi will not be likely to get any of these confused (for each should be fairly accorded his own distinct place among our pre-pioneers), as did the enterprising hackman who, driving some visitors to San Francisco around Golden Gate Park, pointed out the prominent Prayer-Book Cross, erected to commemorate Francis Fletcher's first use of the prayer-book in the present territory of the United States, and explained to them that it was a monument in memory of Saint Francis Drake!

Assisi

[From "Wayfarers in Italy," published in a limited edition;
D. P. Elder and Morgan Shepard, San Francisco, 1902]

By Katharine Hooker

"Douce mélancolie Ombrienne . . ."—BOURGET.

THE station for Assisi lies out in the valley, while the town itself clammers up the hills upon the southern side. The little omnibus that with rather inadequate horses labors across the plain and then winds back and forth, rising till it reaches the compact stony streets, set us down before the Hotel Subasio, unpretentious, but comfortable enough, and commanding a view that in itself might almost afford one a subsistence were the fare less substantial than it is.

We arrived late in the afternoon, and the kindly landlord at once informed us that if we wished to step out upon the piazza close by we could see a religious ceremonial then in progress. We therefore took our way without delay in the direction in which the crowd was tending, and a few moments brought us out upon the Piazza Saint Francis. The church of Saint Francis is one of the most curious and interesting in the world, being in reality three churches, one above another,

partly built against, partly embedded in a stony steep. The lower one is cut out of the solid rock, the next rests upon it and is half supported by a projecting shelf. The third rises above all, to meet a broad sweep of grass which slopes gradually to meet its portal.

The middle church is the oldest and most beautiful and opens at the side upon a piazza partially colonnaded. It was here that the people were gathered, a moving crowd falling from group to group and passing in and out of the portal. The effect was that of a shifting kaleidoscope of beautiful colors in which a shade of mustard-yellow predominated, worn by the women in kerchiefs tied over their heads, but every variety of yellow was represented, as well as other brilliant hues, and there was a fondness for a pattern of gorgeous pink roses on a dark background. The gowns were almost as varied as the kerchiefs. Women of the upper class wore

them of the ordinary cut, usually in light colors, with a black lace veil over the head. One, a real beauty, stood near us for some moments. Her glossy hair and her red lips were typically Italian, but cheeks as rosy as hers are not so often seen here. She wore a rose-colored gown and her black Spanish lace veil was arranged with a deliberate grace. There had been a confirmation in the morning and the little girls were dressed in the crispest pink, yellow or white frocks, with white veils fastened over their curly heads with artificial flowers. They carried bells made of terra-cotta and decorated in red and white patterns, a custom for that festival.

Presently we passed into the church, a solemn, dimly-lighted place, low, with heavy groining and short, ponderous pillars, somberly rich with its ancient frescoes and sparsely lighted by windows of beautiful old stained glass. Twilight pervades it even at noon-day. At the end, which looked very far off, the organ was sounding and many lighted candles glimmered out of the obscurity. At the entrance where we stood daylight fell in and lighted up the ever-moving multitude, who pressed in, knelt before the different altars and then remained standing or passed out again. We waited, watched and were never tired. But at last all the moving crowd stood still, solemn chanting began and the procession, with swinging censers, advanced slowly down the church; priests in their richest vestments of white, gold and crimson, singers, acolytes, and at last, under a canopy, their precious relic, the veil of the Virgin. All the worshipers sank to their knees as it passed them. A great wave of feeling seemed to surge through their ranks; and it was irresistible, we knelt with the rest, and could not have done otherwise. Slowly out of the church it went, and then all the people rose and followed after.

It traversed the lower piazza, and mounting the street beyond till it was on a level with the upper church, turned and came back over the grassy expanse before the entrance. Here all the people stood still again, while the ecclesiastics went on into the church and after a little appeared again in an open loggia above, which was hung with costly tapestry. And here, when the relics came into view anew and were raised above the sill, the people all knelt again and the service pro-

ceeded. At certain points a low, deep murmur rose from the crowd: the responses. It was like the wind through tall trees, not a word audible—only a low-toned, mighty sound that thrilled through one, most impressive, most touching.

At last it was over and the concourse of people began to stream away, many of them having come from a long distance. We leaned over the stone parapet of the upper piazza and were speculating upon the meaning of some things we had just seen when a pleasant voice behind us asked:

"Can I help you? I live in Assisi."

We turned to see the attractive face of a girl of perhaps twenty-five, who smilingly offered to satisfy our curiosity with any explanations we desired. We at once fell into talk and she presently told us that she was English (which we had recognized) and that her husband was a native of Assisi, where she had lived since her marriage.

"It is a treat to me to be able to speak English again. I have hardly spoken it for two years," she added, as we walked away together. She constituted herself our guide and with her we strolled from place to place, visited the churches, lingered to enjoy the views from higher and higher points and finished the afternoon in her own little home, which she laughingly offered as a final interest for sight-seers.

Like all the *quartierini* of Assisi, it was entered by a door opening directly upon the pavement, in the even frontage of gray stone buildings that marches up the hilly streets. A red-tiled staircase led up to the *primo piano*, where a little drawing-room, also with tiled floor, was made homelike by a piano, a glass cupboard of silver and some books and pictures. All the light came from one large window set high in the wall and reached by three steps which led up from the floor. A sunny dining-room opened beyond, yet the most interesting apartment was the kitchen, where the place of the prosaic cooking-stove was taken by an impressive altar, fit for sacrifice. A bonnet-like roof projected above, to lure the smoke of burnt offerings to the chimney, no doubt, and all about the walls hung copper utensils of such graceful shapes that the thought of using them for merely culinary purposes presented itself as almost desecrating.

But best of all, and a flight above the rest,

there was a refuge for warm evenings, an open loggia large enough to take tea in and at the same time look down upon Assisi, descending street below street toward the wide-spreading plain reaching away to more distant hills. Our hostess, whose kindly hospitality was not yet tired, walked back with us to our hotel. As we went she confessed that she found little companionship among the dwellers in Assisi.

"But," she added, "I have my baby now, so I need nothing more."

With her husband, her baby and her books she professed herself entirely contented, and her looks went far to prove the success of at least one international alliance.

On the way we met two sweet-looking elderly nuns, friends of our companion, and after a few moments of talk they in the most friendly way invited us to enter their convent which was close by, where in a little parlor to which we were shown they treated us to rosolio and strange little cakes, made in curiously elaborate form and strongly tintured with anise. It appears that rosolio may be of different colors. Till this time we had seen it only pink as the pinkest roses and redolent of their fragrance, but this liqueur was as deep in color as a Jacqueminot and with a little spice added to its rosy flavor.

The next morning we again joined our friend, to explore Assisi and the suburbs beyond its walls. At one point we passed a public fountain where women were gathered to wash and stopped to watch them for a while. Animated was the chatter and loud the laughter proceeding therefrom, and our Signora remarked:

"This is the great gossiping center of the town. All scandal begins here!"

Under a roof supported on pillars are two great stone tanks, one for washing and the other for rinsing. On the slanting stone rim of the tank they spread out the garments and soap them thoroughly; they next go through a process of pressing, squeezing and sometimes beating, but never rubbing. Then wet, full of soap and heavy as lead they are packed into a basket and carried home on the head, up many a precipitous incline and flight of steep stairs. Arrived at home the clothes are put into a great earthenware tub, but first carefully sorted and the garments of the women and children placed below with those of the men above, otherwise the owners

would suffer terrible aches and pains. Over all a coarse cloth is laid and upon it a layer of wood ashes, then tepid water is poured on and next boiling water, after which all is covered over and left to stand all night. In the morning the heavy burden is again carried down to the rinsing basin and eventually the clothes are delivered rough dry. The final operations of starching and ironing are done at home and even women who are well-to-do learn to perform these for themselves.

The cheapness of living in Assisi is a marvel. On seven lire a day (a dollar and forty cents) a family of three may live like princes, so says our little friend, illustrating it in her own ménage. They keep, she tells us, a maid-servant, and a man comes in each day to do the rougher work. The wages of a man-servant is two dollars a month and that of a woman a dollar and forty cents. They have a horse and vehicle for driving about and the rent of their apartment is twenty-five dollars a year. Some idea of the cost of provisions may be gained when it is known that eggs are about six cents the dozen and green peas two cents the pound.

Meals are arranged as follows. Coffee is taken in bed at about seven in the morning. It may be interesting to note here that in Assisi this beverage is looked upon as a panacea. If symptoms of illness appear there is no painful uncertainty as to the proper means to avail oneself of. Consign the patient to bed at once and administer cup after cup of strong coffee. This will in the end vanquish any disease.

At eight o'clock there is an informal meal called "the standing breakfast," when something substantial like eggs or ham is served, and at twelve comes *colazione*, the first important repast, of which the courses are apt to be soup, macaroni, and a dish of meat perhaps, of course accompanied by bread and wine. Instead of afternoon tea, at four o'clock a glass of wine is taken, and dinner comes at half past eight, when perhaps there may be roasted kid and salad as features of the repast, all of which goes to show that living cheaply in Assisi does not mean living poorly; and when it is added that we saw a pretty and well-fitting gown for the making of which the dressmaker's charge was eighty cents, little remains to be added!

And why could not a worse fate overtake one than to live [*Concluded on page 12*]



The Lake Merced Rancho is as rich in natural beauty as in historical associations. In the very beginning of San Francisco exploration the leather-coated soldiers of Spain trod this ground, while the Franciscan padres gave the lake a name that sounds like a benediction



The sun tenderly caresses Merced's lovely waters, and the moon practices here a very special witchery. That there are few spots so beautiful in the metropolitan areas of the United States is the ready testimony of those who have traveled far in search of Nature's best



Motorists speeding over the Lake Merced Rancho on the Skyline Boulevard catch views like this, and return to experience the full enchantment of the scene—wooded hills in the distance, noble trees everywhere, and peaceful waters brooding under a sky that shares its color with the lake



Lake Merced was named one year before the Presidio and Mission of San Francisco were established. Here and there on its broad acres are signs recounting its early history, while miles of riding-trails are marked with reminders of stirring events that happened here in later years

St. Francis Preaches to the Birds

[From "The Little Flowers"]

AND he took as his companions Friar Masseo and Friar Agnolo, holy men. And going with impetuosity of spirit, taking thought neither of way nor path, they came to a walled place which is called Savurniano; and St. Francis began to preach; but first he bade the swallows which were twittering to keep silence until such time as he should finish preaching; and the swallows obeyed him; and there he preached with so great fervour that for devotion all the men and women of that town were minded to follow him and to abandon the town; but St. Francis suffered them not, saying:

"Be not over-hasty to depart; and I will ordain that which it behoves you to do for the salvation of your souls."

And then he bethought him to institute the Third Order for the universal salvation of all men; and so, leaving them greatly comforted and with minds turned to repentance, he gat him thence and came betwixt Cannano and Bevagno.

And passing on, full of fervour, he lifted up his eyes and saw certain trees hard by the road; whereat St. Francis marvelled, and said to his companions:

"Ye shall await me here on the road, and I will go and preach to the birds my sisters."

And he went into the field and began to preach to the birds which were upon the ground; and anon those which were in the trees came to him, and all of them stood still together until St. Francis finished preaching; and even then they departed not until he gave them his blessing; and according to that which Friar Masseo afterward related to Friar James of Massa, when St. Francis went about among them touching them with his mantle, none of them moved therefor.

Now the preaching of St. Francis was on this wise:

"My sisters the birds, much are ye beholden unto God your Creator, and alway and in every place ought ye to praise Him, because He hath given you liberty to fly wheresoever ye will, and hath clothed you on with twofold and threefold raiment. Moreover, He preserved your seed in the ark of Noah that your race might not be destroyed. Again, ye are beholden unto Him for the

element of the air which He hath appointed for you; furthermore, ye sow not, neither do ye reap; yet God feedeth you and giveth you rivers and fountains wherefrom to drink; He giveth you mountains and valleys for your refuge, and high trees wherein to build your nests; and, in that ye know not how to sew nor spin, God clotheth you and your little ones; wherefore doth your Creator love you, seeing that He giveth you so many benefits. Guard yourselves, therefore, my sisters the birds, from the sin of ingratitude and be ye ever mindful to give praise to God."

And, as St. Francis spake these words unto them, all those birds began to open their beaks, and to stretch out their necks, and to open their wings, and reverently to bow their heads even unto the ground, and to show by their motions and by their songs that the holy father gave them very great delight; and St. Francis rejoiced with them and was glad and marvelled much at so great a multitude of birds, and at the most beautiful diversity of them, and at their attention and fearlessness; for which cause he devoutly praised the Creator in them.

Finally, when he had made an end of preaching, St. Francis made over them the sign of the Cross and gave them leave to depart; whereupon all those birds rose into the air with wondrous songs; and thereafter, according to the form of the Cross which St. Francis had made over them, they divided themselves into four bands; and one band flew towards the East, and one towards the West, and one towards the South, and the fourth towards the North, and each company went singing marvellous songs.

* * *

For those who have not had occasion to acquaint themselves with the literature of St. Francis, it might be well to say that the "Little Flowers," or "Fioretti," from which the story of St. Francis preaching to the birds has been taken, is a masterpiece that has won the highest admiration from critics in every age. As an introduction to the life of St. Francis no book can be more highly recommended than Maurice Francis Egan's "Everybody's St. Francis."—EDITOR.

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IN urging a statue of St. Francis of Assisi for San Francisco, the editor of SAN FRANCISCO WATER feels quite safe in saying that no sculptor in the world would be indifferent to the execution of such a commission. The reason is that some of the world's greatest sculptors in other ages, beginning with Della Robbia, gained immortal fame by their statues of the Assisian, and the great sculptors of today are always eager for the opportunity to measure their abilities against the giants of their art. This is a form of emulation that is altogether praiseworthy.

Painters too have delighted to honor St. Francis, from far-off Giotto and Cimabue to contemporary Boutet de Monvel.

The list of great poets who have sung his praises begins with the radiant name of Dante. The author of the Divine Comedy was born in 1265, only thirty-nine years after the death of Francis. During his lifetime men definitely arrived at that estimate of the saint's world-importance which has never since been set aside. Small wonder, then, that a canto of the *Paradiso* is devoted to the glorification of the gentle saint who espoused "Our Lady Poverty."

The opportunity to enrich these pages with a quotation from Dante is one not to be overlooked. The following translation of part of the "The Canto of St. Francis" (*Paradiso* xi, 73 et seq.) is by Dr. Melville Best Anderson, that distinguished Dantean scholar of Stanford University who has devoted twenty-eight years of his life to an English version of the Divine Comedy. Dr. Anderson's *magnum opus*, revised and perfected over the previous edition, will be brought out early next year in four magnificent volumes, the work of John Henry Nash. After telling how the youth Francis espoused Poverty, Dante proceeds:

But lest too enigmatic be my strain,
from my long parable shalt thou infer
that Poverty and Francis are these twain.
So blithe and so harmonious they were,
their love, their wonder, their communion sweet
in all around set holy thoughts astir;
Whence venerable Bernard first thought meet
to go unshod, and after so great peace
he ran, and running blamed his lagging feet.
O wealth untold, good fruitful of increase!
Giles bares his feet, Sylvester his, behind
the Bridegroom, such the Bride's peculiar grace.
Then with his Lady and with the house assigned,
all with the humble cord begirded now,
went forth that Father and that Master kind;
Nor did he cravenly abase his brow
as son of Peter Bernardone, or feel
cast down by strange contempt. But his stern vow
With regal dignity did he reveal
to Innocent the Pope, by whom was granted
for his religious order the first seal.
As multiplied the poor folk who had panted
to follow him whose life-work marvelous
were better in the glory of Heaven chanted,
This Master-shepherd's holy zeal for us
was sealed with crown of the Eternal Spirit
a second time through Pope Honorius.
Then preached he to the Soldan proud (to merit
the palm of martyrdom he would have borne)
Christ and his followers; but since to hear it
He found unripe that folk, who put to scorn
salvation, and lest vain should be the quest,
returned to harvest of the Italian corn;
'T'wixt Tiber and Arno on the rocky crest
from Christ's own hand the final seal he won,
borne for two years upon his limbs impress.
When God, allotting him such benison,
vouchsafed to draw him to the meed above
that he had gained by being a lowly one,
Unto his brethren, as right heirs thereof,
bequeathed he all his wealth, his Lady dear,
bidding them hold fidelity in love;
And from her breast the lofty spirit clear
desired to pass to its own realm divine,
and for its body willed no other bier.

Such was our Patriarch; and they who please
to follow him, obeying his command,
take on such freight of good commodities.

* * *

Assisi

[Continued from page 6] long in gentle Assisi, to listen to the organ and ponder over the faded frescoes in its dim churches, to climb the mountains at its back and tarry at their hidden villages and monasteries, to sit at evening in the high arch of some ancient window and gaze out over the quiet beauty of this Umbrian landscape, where the loving spirit of Saint Francis seems to hover and his peace to have settled upon the veiled distances of the plain?

Lake Merced's Classic Race

THROUGH the kindness of Mr. Luke Fay, than whom no San Franciscan is better informed on the history of his native city, *SAN FRANCISCO WATER* presents herewith an account of the Thad Stevens race at the old Ocean House track at Lake Merced.

Doubtless many San Franciscans will learn with some surprise that there was a race-track at Lake Merced in the seventies. To others it is just another reminder that that beautiful part of our peninsula is exceedingly rich in historical associations.

The story of Lake Merced, in so far as white men are concerned, begins one year before the founding of San Francisco. The lake received its name on September 24, 1775, when Don Bruno de Heceta, Spanish explorer, camped there with his soldiers. There were two Franciscan padres attached to his party—Father Palou and Father Campa. It was the feast day of Our Lady of Mercy, and that fact suggested the name. In the same way Lake San Andres in San Mateo County took its name from the feast day of St. Andrew.

Among the thousands who witnessed the victory of Thad Stevens there must have been many who remembered United States Senator Broderick, who died in 1859 as the result of a duel fought with Judge David S. Terry at Lake Merced on the thirteenth of September. The night before that fatal encounter Senator Broderick slept—or tried to sleep—at the Lake House, which was not far from the establishment conducted by Cornelius Stagg. Since Spring Valley Water Company laid out equestrian trails at Lake Merced, the place where the duel was fought and the markers placed by the Native Sons have become familiar to hundreds of our citizens.

That Lake Merced had been a dueling ground before the Broderick-Terry encoun-

ter, is more than likely. Dueling was common in San Francisco during the first decade after '49, and the Merced Rancho, remote from the paths of the sheriff, was admirably fitted to the exigencies of the *code*. But that its very remoteness had a serious aspect was illustrated in the fate of Broderick. Seriously wounded, he was taken by carriage to the other extremity of the peninsula—Black Point—where he died. Speedier medical attention might have saved him.

Not long after the exciting contest described by Mr. Fay, racing departed from Lake Merced. At the session of the Legislature during 1873 and 1874, an act was passed closing certain streets leading into Fulton opposite Golden Gate Park. The purpose was the construction of the Bay District Track, an enterprise in which Senator Stanford and other magnates of the transcontinental railroad were deeply interested.

"The establishment of the track in this location," writes a San Francisco historian, "was largely influenced by the plans of those connected with the street-car system. At the time of its creation, to most people in San Francisco it seemed a location which would not soon be reached by the advancing tide of homeseekers, but those who invested their money in the enterprise foresaw that they would get it back in the near future when the demand for lots would make it profitable to cut up the tract."

Racing returned to the neighborhood of Lake Merced some years later, when the Ingleside race-course was constructed. Then racing departed from the city and county of San Francisco, never to return. When it was revived again for the benefit of San Franciscans, the present Tanforan course at San Bruno in San Mateo County was constructed.

Here is Mr. Fay's narrative:

By Luke Fay

THE Ocean Race Course, so called from the popular Ocean House that catered to wants of sportsmen and others in the vicinity, was out on Ocean Avenue, adjacent to Lake Merced, and was accessible by rail from the Fourth and Brannan Street depot of the San Francisco and San Jose Railroad, which ran two trains a day in 1864. Passen-

gers to the hotel or the races could book to San Miguel City (now Ocean View) and thence walk over a couple of miles to the race-track or to the Oceanside House. But, of course, on great occasions there were thousands that drove out in vehicles of various sorts rather than depend upon the slender resources of the railway that subsequently



The famous old Ocean House on the Lake Merced Rancho

became part of the great Southern Pacific System.

The Ocean House and Ocean Race Course were generally known in the early '70s as the Ocean View Race Course and Ocean View House, which, under the guidance of Cornelius Stagg, became the most celebrated sporting rendezvous in Western America.

It was at this track that the most famous race in the history of the California turf, the Thad Stevens Race, was run November 15, 1873, and established permanently the superiority of the California race-horse.

This was some race—four heats of four miles each, against the picked horses of the East, Kentucky, and the Middle West, for a purse of \$20,000.

In this Homeric contest George Treat's California-bred sorrel horse, Thad Stevens, defeated William Wightman's Michigan-bred bay, four-year-old horse, Joe Daniels, and John J. Chamberlain's Kentucky-bred bay horse, True Blue. William Hall's bay mare, Mamie Hall, also started in the first heat, but she never figured prominently in the betting, and in the first heat got distressed, threw her jockey, and was withdrawn.

Aside from the sporting importance of this event, it drew the greatest attendance and was socially the biggest affair that had occurred in California up to that date. The population of San Francisco was then less than 100,000. More than 40,000 persons

were estimated to have witnessed the race—more than one-fifth of the entire population of the city. And the Ocean View Track was then normally supposed to accommodate only 16,000 spectators.

The writer, who was then only a small boy going to St. Mary's College, was one of the 40,000 interested onlookers; and the pictures of the horses, the crowds, and the twinkling lanterns at the close of the racing, are as vivid in his memory today as they were fifty years ago.

Before attempting any description of the event, it may be well to give the results of the four heats in abbreviated form so as to show at a glance how they were run:

First Heat—Joe Daniels, (W. J. Palmer) 1; True Blue, (George Barbee) 2; Thad Stevens, (Charles Ross) 3; Mamie Hall, 0. Time: 7 minutes 45 seconds. Won by 3 lengths; Mamie Hall got distressed early in the race and retired.

Second Heat—True Blue, 1; Joe Daniels, 2; Thad Stevens, 3. Time: 8 minutes 8 seconds. Won by 5 lengths.

Third Heat—Thad Stevens, 1; Joe Daniels, 2; True Blue, 0. Time: 7 minutes 57 seconds. Won by 6 lengths. True Blue strained a tendon at the third mile and retired.

Fourth Heat—Thad Stevens, 1; Joe Daniels, 2. Time: 8 minutes 20 $\frac{3}{4}$ seconds. Won by 6 lengths.

For all of a week before this race was run the whole town was wild with excitement over it, and in every resort from the Ferries to Ocean View itself, and from North Beach to the Mission Creek, it was the sole subject of discussion.

Out at Barney Farley's, at the junction of the Ocean Beach and old Oceanside House roads, where all the sports would gather to hear Barney tell about his prize-fights and his protégé, "My boy Joe," who was Joe McAuliffe, even Barney himself took to "talking horse" and advising everybody to come out early to see the race and be sure to back Thad Stevens.

Sportsman though he was, Barney always had an eye to the main chance. The bigger the crowd that came to the races, the better for Barney's establishment. He was not disappointed. His place began to overflow with customers early Friday night, and it kept

filled, inside and out, with a milling crowd from that time until late Monday morning.

The newspapers were filled with reports about the horses, the betting, and everything else. True Blue had been started across the continent from Baltimore on a special car nearly three weeks before the race, and the papers chronicled his travels as if he were the President on an election tour. Somebody brought out a *pari-mutuel* machine, or totalizer, from New York, and installed it at the Lick House, where fresh pools were made on it every night. The papers published hallelujahs about it, showing how it made betting as pure as the snow, and exhorting preachers to send their daughters to see the race, and even to bet on it *pari-mutuel* fashion, on that account. Everybody was race-crazy.

The first heat was timed to start at two o'clock Saturday afternoon, but long before dawn the walking brigades were under way and the scene was like the road to Epsom on an English Derby Day, only more so. The weather was fine. Crowds packed the roads. As well as the pedestrians, there were hacks, carts, and wagons of every description that went into the jitney business for the great occasion, and charged \$40 a carload—or what have you?—to carry enthusiasts to or from the track.

As well as the amateur enthusiasts, there were scores of clowns, acrobats, three-card men, thimble-riggers, minstrels, and fakers of every description. There were also hundreds of young hoodlums belonging to various gangs North and South of Market. Long before noon all the hills overlooking the track were packed with men, women, and boys that did not feel like paying two dollars to get inside the fence that surrounded the park, and fun was fast and furious.

By that hour also the Ocean View House and Seaside Cottage, that were part of Stagg's establishment within the enclosure, were packed to the balconies. Wines, beers, liquors of every kind were flowing like water. Luncheons were being served at crowded tables. Champagne corks were popping like machine guns in action.

Three days earlier Stagg had been offered and had rejected \$15,000 in gold for the gate privileges to the race. Admission to the track was two dollars, while the grandstand



Another view of the resort. (From the Luke Fay collection)

cost one dollar extra. Admission to the quarter-stretch, "with all privileges," cost ten dollars. The quarter-stretch and the grandstands (which held more than 6000 people) were packed. So was the lawn inside the track that accommodated about 10,000 people. By two o'clock 20,000 people had paid their way into the course, and there were probably a thousand hoodlums and others that had rushed the gate.

The first heat was to have started at two, but just before that hour there was an alarm of fire which upset some of the crowd in the vicinity of the grandstands but created no panic. A blaze had started in the coalshed of the café behind the stand, but it was quickly extinguished.

At that time all the rank and fashion of northern California was at the track. Governor Booth and Chief Justice Wallace arrived in the same barouche, ex-Governor Leland Stanford and Senator Felton in another. Mayor Alvord, as well as all the city officials and all the judges, were there with other citizens of humble rank. All the "Bonanza Kings" and other leaders of finance were there in their finest equipages. All the families from the fashionable districts—the McAllisters, the Barroilhets, the Stewart Menzies and other society leaders. Mrs. Lily Hitchcock Coit and other high society women were there in their finest equipages. All the families from the fashionable districts—the McAllisters, the Barroilhets, the Stewart Menzies and other society leaders. Mrs. Lily Hitchcock Coit and other high society women were there in their finest equipages. All the families from the fashionable districts—the McAllisters, the Barroilhets, the Stewart Menzies and other society leaders. Mrs. Lily Hitchcock Coit and other high society women were there in their finest equipages.

Stevens struggle for the supremacy of the American turf against True Blue and Joe Daniels. Mamie Hall did not count.

But four-mile heats, though they test the strength and endurance of the horses to the utmost, are rarely such desperate and exciting neck-to-neck struggles as are races of a mile or less. Therefore, the four great heats in this great race were comparatively tame as regarded from a spectacular point of view.

Charles Ross was Thad Stevens' jockey; W. J. Palmer rode Joe Daniels; George Barbee, a famous English Jockey, rode True Blue. Mamie Hall's jockey was a stable lad.

In the first heat, all four got away to an even start, galloping easily. Joe Daniels raced evenly with True Blue for the first half-mile, with Thad Stevens swinging along easily behind them, and Mamie Hall in the rear. In the second half Joe Daniels forged ahead, while Mamie Hall got wild and flung off her rider. When caught, she was found to be a sick mare, and was taken back to her stall. Meanwhile Joe Daniels made a fast pace and held it, with True Blue galloping close behind and Thad Stevens going easy some lengths to the rear. Thus they kept the going until entering the home-stretch, where Joe Daniels still kept his great pace, but True Blue challenged him. Then there was a race that set the immense crowd cheering. But Joe Daniels had too good a lead, and was too good a battler. As Palmer gave him the quirt, he sprang forward gamely, and rode in an easy winner by three lengths. The same distance separated True Blue and Thad Stevens; but whereas it was then plain that the Kentucky horse had been ridden hard, the Californians noted that Ross had not driven Thad for a yard of the running, and he was as fresh as paint at the finish. The time of the race, 7 minutes and 45 seconds, was $25\frac{1}{4}$ seconds below the then record for the distance, made by Lexington in 1855.

The second heat was slower than the first. The three horses raced in a bunch, with Thad Stevens trailing a little for the first three miles. Then True Blue pulled out with a splendid spurt and won easily by five lengths, with Thad Stevens still going easily three lengths behind Joe Daniels. The time was 8 minutes and 8 seconds.

Two heats gone, and Thad Stevens last in each! The inexperienced California enthusiasts inside and outside the course were

bemoaning the outlook, and many of the knowledgeable ones did a little discreet hedging. The betting was fast and furious, and because Joe Daniels was only a four-year-old and True Blue was a more seasoned horse, most of the Eastern money was wagered on the latter.

The third heat had a flying start, with True Blue and Thad Stevens racing nose and nose for the lead. Both horses had already done eight miles, but the pace they made was gruelling. For more than three miles they seesawed neck and neck. Then suddenly the Kentucky horse faltered, and Joe Daniels swept past him, with Thad Stevens well in the lead. True Blue slowed and limped. The game thoroughbred had sprung a tendon. Only two horses were left in the race. Joe Daniels spurred gallantly in the home stretch, but Ross simply let out the Californian without touching whip or spur to him, and Thad romped in a winner by six lengths.

The time, 7 minutes and 57 seconds, was remarkable, considering that the run was the third four-mile heat of the same afternoon.

Dusk was falling when the fourth heat started. Carriage lamps were being lit, and lanterns were twinkling along the home-stretch. The horses got away to an even start; but the race was merely a procession. Thad Stevens made the running as he pleased from the four-year-old, and galloped home six lengths ahead. Time, 8 minutes and $20\frac{3}{4}$ seconds.

But nobody cared what the time was. Darkness closed in on a tumult of cheers and twinkling lanterns. Hats were flung high in the air, men yelled with delight and thumped absolute strangers on the back in their jubilation. Everybody was inviting everybody else to Staggs' or Barney Farley's or any other place where they could quickly and properly celebrate. Ladies were squealing with delight. Everybody was in a delirium of happiness as the crowds melted off the surrounding hills and poured through the gates of the race-course—40,000 at the end of a perfect day.

For hours the roads were twinkling with the lights of the lanterns, and all the road-houses were doing a land-office business. Down in Barney Farley's it was not "My boy Joe" that the host talked about, but "Our horse Thad."

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RAISE TO THEE,
MY LORD,
FOR SISTER WATER,
USEFUL AND
HUMBLE,
AND PRECIOUS AND CHASTE!

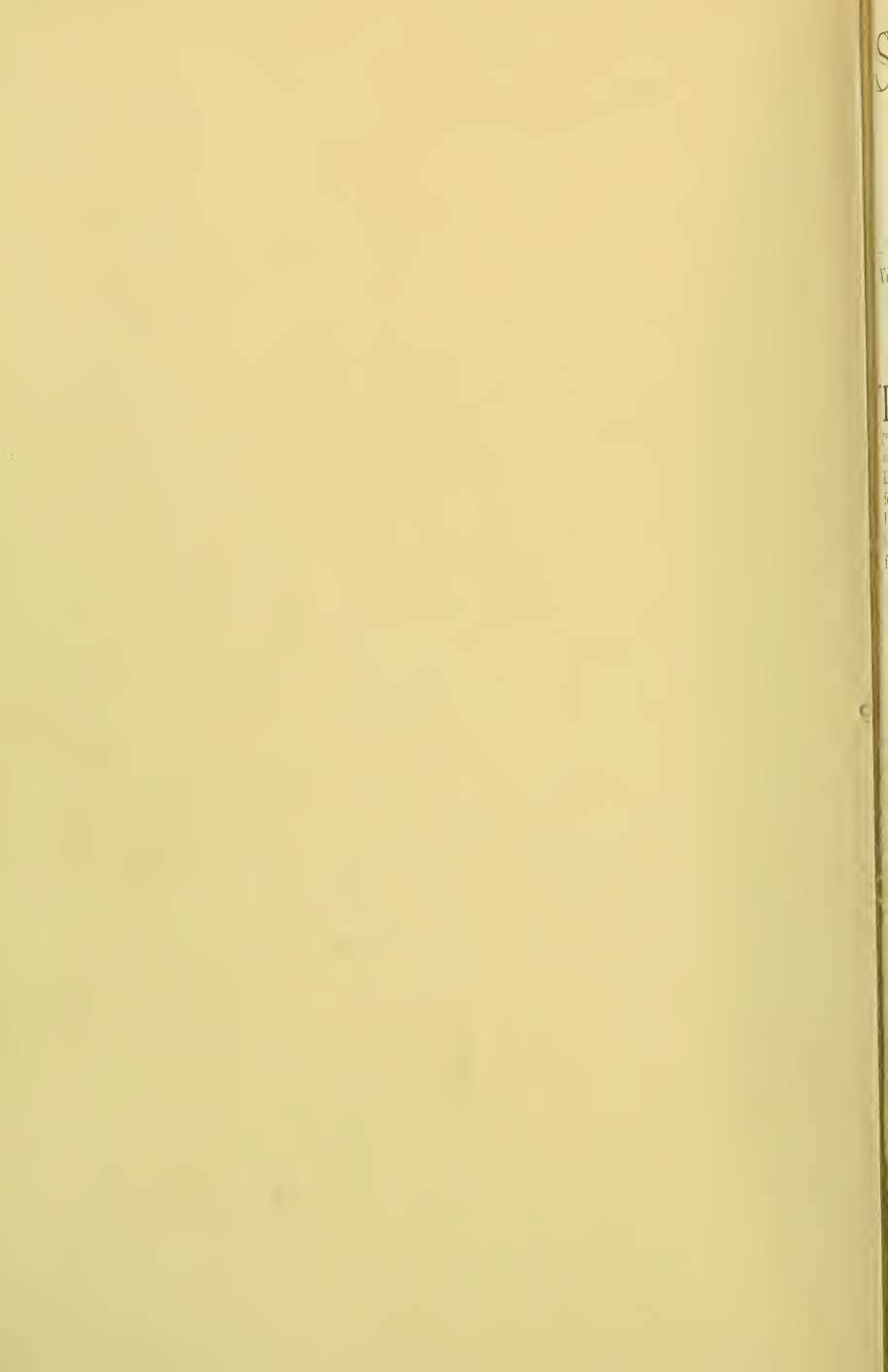
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A Memorial to Hermann Schussler

"IF you seek his monument look about you." As the motorist from San Francisco approaches that part of the Skyline Boulevard which traverses the top of Crystal Springs Dam, he notes a huge boulder reared in a formal setting at the edge of the reservoir. Upon its rugged face this boulder carries a bronze tablet with a portrait in relief and the following inscription:

HERMANN SCHUSSLER

1842-1919

o

ENGINEER

SPRING VALLEY WATER COMPANY

1864-1908

o

"IF YOU SEEK HIS MONUMENT
LOOK ABOUT YOU"

This is the memorial recently erected by Spring Valley Water Company to the honor of its great engineer.

The spot is a beautiful one. Crystal Springs Lake is outspread in all its silver placidity. Beyond are the glorious San Mateo hills. Over the rock bends an ancient, storm-beaten tree. And it is a significant spot for the purpose of such a memorial. For when Hermann Schussler created the water supply of San Francisco, he crowned his lifework by the construction of the great Crystal Springs Dam.

The memorial was designed by Gardner A. Dailey, architect, and the tablet is the work of José Moya del Pino, sculptor and painter.

Many will recognize the concluding words of the inscription. They are translated from the Latin epitaph of Sir Christopher Wren. That great architect, who placed the seal of

his genius upon the city of London after the Fire of 1666, is commemorated in St. Paul's Cathedral, the greatest structure he designed. His memorial is a tablet placed over one of the portals, bearing these words: *Si Monumentum Requiris, Circumspice*. This phrase of noble simplicity was borrowed by Spring Valley Water Company to express its admiration for Hermann Schussler.

Hermann Schussler, thus commemorated in rock and bronze, might well say for himself, in the words of Horace, *Execi monumentum aere perennius* (I have erected a monument more lasting than brass). As long as San Francisco exists his fame will be perpetuated by his work.

The great Hetch Hetchy system of water supply will not supersede, it will coordinate with the Spring Valley system devised and built by Schussler between the years 1864 and 1908. Succeeding engineers have expanded his work and added important new elements of supply and distribution, but his was the pioneering achievement.

Speaking of his entrance into the service of Spring Valley, Ray W. Taylor in his book "Hetch Hetchy" says:

"The choice of Schussler, while not realized at the time, was a momentous one for the City of San Francisco. He was a dominant figure in the affairs of the Spring Valley Water Company for fifty years. He developed the city's water system as it exists today. Upon his recommendation the company little by little secured its vast holdings of over 100,000 acres of land."

Mr. Taylor places the emphasis where it belongs—upon the benefit derived from Schussler's abilities *by the city of San Francisco*. Fittingly, his memorial will become a public monument.

Four Spring Valley Engineers

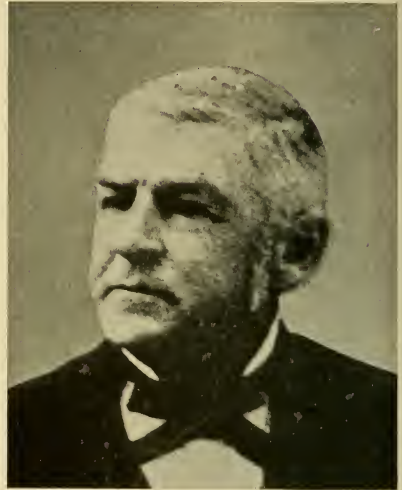
UPON the occasion of the commemoration of Hermann Schussler at Crystal Springs Dam, it seems fitting to set down in some detail the work of the four chief engineers who carried Spring Valley Water Company from humble beginnings to its present position as a great metropolitan supply. They are, in the order of their service, A. W. Von Schmidt, Hermann Schussler, Fred C. Herrmann, and George A. Elliott.

I

When John Bensley founded the San Francisco City Water Company, in 1858, he chose, as chief engineer, A. W. Von Schmidt, an engineer of distinguished local standing. Under Von Schmidt's direction, the first supply was brought from Lobos Creek by tunnel, flume, and pipe around Fort Point to the foot of Van Ness Avenue. Thence the water was pumped to two reservoirs on Russian Hill that are still in use—the Lombard-Street and the Francisco-Street reservoirs. This supply consisted of 2,000,000 gallons a day.

In 1860 the Spring Valley Water Works was organized by George Ensign. Its first supply was obtained from Islais Creek, the water being carried by flume and pipe to a reservoir at Sixteenth and Brannan Streets. This supply amounted to 200,000 gallons a day.

In April of 1860 A. W. Von Schmidt left the service of the San Francisco City Water Company to become chief engineer of the Spring Valley Water Works. Under his supervision the younger company immediately looked to San Mateo County for an adequate supply. By September of 1860 Von Schmidt had commenced the construction of a small earth dam across Pilarcitos Canyon, high in the San Mateo hills. This structure, completed in December, 1863, formed a reservoir impounding 65,000,000 gallons of water. While the dam was being built, a tunnel was driven through the San Mateo hills from Pilarcitos Creek to San Mateo Creek, this work being completed in May of 1861. Water from the original Pilarcitos Reservoir was carried through the tunnel, and then by flume and pipe-line a distance of thirty-two miles to reservoirs in San Francisco.



A. W. Von Schmidt

In 1864 Von Schmidt retired from the service of Spring Valley Water Works. He had been with the Company for less than five years.

Allexey Waldemar Von Schmidt was born near Riga in Courland, Russia, on the 25th of August, 1821, and was brought to the United States at the age of six. His father was an old soldier of the Czar who had fought at Waterloo and who practiced in Eastern states the profession of civil engineer. Von Schmidt came to California during the gold excitement, traveling around the Horn and landing in San Francisco on the 24th of May, 1849. He had adopted his father's profession and immediately began to practice in San Francisco. He was a deputy United States Land Surveyor for several years, and also worked for various mining companies in California and Nevada, designing flumes and ditch systems and building pumping plants.

After leaving the service of Spring Valley Water Works, he continued in the general practice of his profession, and his most famous achievement was his successful destruction, under government contract, of

Blossom Rock, a menace to navigation in the main ship channel of San Francisco Bay.

Blossom Rock was situated in San Francisco Bay, directly east of the Golden Gate, due north of the city, on a line between Alcatraz and Goat (or Yerba Buena) islands, and nearly midway between them. It was distant from the city front about 1500 yards. It was directly in the course that vessels were often compelled to take in entering and leaving the harbor; was in the track of vessels passing to and from San Francisco and the Mare Island Navy Yard, and was also in the way of all passenger steamers and vessels plying between San Francisco and the Sacramento and San Joaquin rivers. The rock was discovered and named in 1826 by Captain Beechey of the British Navy, who entered San Francisco Harbor in command of the "Blossom."

The top of the rock was about five feet below the surface of the water at mean low tide. Its greatest length at the depth of twenty-four feet was 195 feet, and its greatest breadth at the same depth was 105 feet. The place is exposed to southeast gales, which prevail there in the winter months, and the tide whirled over the rock at such a rapid rate that the buoy, placed by the Lighthouse Department, had several times been swept away.

The order for the removal of Blossom Rock was issued by the Engineer Department of the United States Army in July of 1866, but the contract for its removal was not awarded to A. W. Von Schmidt until June of 1869, his compensation being fixed at \$75,000.

The work has been described as follows by Glenn B. Ashcroft, writing in the *Year Book of the Society of Engineers* for 1928:

"The originality of the plan and its method of execution attracted nation-wide attention at the time. Briefly summarized they were as follows: A survey having disclosed that the surface of the rock (about 180 feet by 90 feet) was fairly level and of soft material, he constructed a large scow and upon it a double walled coffer dam about eight feet by eight feet, the bottom of which was armed with long iron spikes; this he towed over the spot and sunk to a bearing by piling in loose rock; a hole was then cut through the bottom and an 'Iron Turret' cemented into the rock; through this well



Hermann Schussler

hole the excavation proceeded until an irregular cavern some 140 feet by 50 feet had been cut to a depth of 37 feet below low water; this cavity was then charged with 43,000 pounds of black powder placed in sealed casks and connected by insulated wires arranged for discharge by electric battery.

"However familiar all this sounds to the engineer of today, it was at that time the first case of submarine blasting conducted in that way; hence the progress of the work was eagerly watched by the townspeople and many eminent engineers came to inspect it. As the time approached for firing the blast, interest rose to a high pitch; much speculation as to the final result was indulged in; and at last on the appointed day, the whole town turned out en masse to witness the spectacle. The local press of that day devoted many columns to the new event; from these we can here record but the briefest extracts:

"Probably 50,000 people witnessed the grand spectacle, such a sight as never was presented in this city before. Along every



The placid lake—the San Mateo hills—the storm-beaten tree—in this setting Hermann Schussler is remembered

street rattled thousands of wagons and carriages, and horsemen dashed rapidly here and there. Dense crowds lined the wharves, hills and all points of vantage and crafts loaded with sightseers covered the bay. Several fights took place on Telegraph hill among the rougths, but no particular damage was done.' ”

The blast was set off at five minutes past two P.M., August 23, 1870. “A large circular volume of water about 400 feet in diameter shot into the air to the height of about 100 feet, while in the center and amalgamated with the water could be seen black volumes of smoke and a sheet of stones, the latter ascending far above the water and presenting on the whole the appearance of a vast volcanic eruption. Immediately after the explosion every steamer and tugboat blew their whistles and dipped their colors. Bells were rung, guns fired and a general feeling of delight and admiration seized every spectator.

The crowd now broke over the hill and commenced the descent to the City. The jam was fearful and pickpockets enjoyed a harvest. Women with children in arms and small boys were jostled until they were willing to fall out and wait until the rush was over. A man who had partaken of too much *pop* missed his footing on a narrow path and rolled down the side of Telegraph Hill several rods into a hole. Several parties were jostled and crowded off the steep embankment on Montgomery Street, but no one sustained serious injuries.’

“Colonel Von Schmidt, who had backed this enterprise with his own money, since the contract stipulated that no payment would be made until successful termination of the work, had exercised such foresight and skill that not a single accident occurred to mar the progress of the job, and after clearing away the débris he was able to satisfy the government officials in charge and collect his fee in

full. He patented the methods he had used, but apparently all the reward he ever reaped from this was litigation."

In a report to the Washington authorities upon the completion of the project, made by Major R. S. Williamson and Lieutenant W. H. Heuer, of the Corps of Engineers, Von Schmidt was paid the following tribute:

"Mr. Von Schmidt deserves a great deal of credit for the work he has achieved. His daring character is shown by his accepting a contract in which he was to receive no money until the completion of an experiment, the success of which could only be decided by the United States as the sole arbiter. The energy with which he pushed forward the work until the explosion took place, and the renewed energy with which he pursued his labor under such discouraging circumstances, deserves the success he attained."

A. W. Von Schmidt died May 26, 1906, in the eighty-fifth year of his age.

II

A. W. Von Schmidt was succeeded at Pilarcitos by Calvin Brown, who started the construction of a larger Pilarcitos Dam. In this work he was joined, October 1864, by Hermann Schussler.

Schussler came to Spring Valley on the



Where motorists pause



In time-defying bronze

eve of important events. The year 1865 marked the absorption by Spring Valley of the San Francisco City Water Company, likewise the completion of Spring Valley's first big distributing reservoir in San Francisco, Laguna Honda, for the reception of the increased supply from Pilarcitos.

Hermann Schussler was born in 1842 in the little village of Rastede, Grand Duchy of Oldenburg, Germany. He came to California after studying engineering in the schools of Zurich and Karlsruhe, and after some practical experience at Lucerne and Bremen.

In a pamphlet published in 1906 he outlined his Spring Valley activities in the following characteristically matter-of-fact way:

"On October 8th, 1864, I had been appointed as engineer of that part of the works of the original Spring Valley Water Works which related to the headwaters in San Mateo County and the conduit lines constructed and to be constructed into San Francisco.

"In the fall of 1864 the foundation of the large Pilarcitos main dam was started and, early in 1865, the second long tunnel on the proposed new Pilarcitos conduit line.

"In May, 1866, I was appointed Chief

Engineer of the entire Spring Valley Water Works, with headquarters in San Francisco, and have continued in this position from that date up to the present. During this long, continuous period of over four decades, I have designed and constructed all the works necessary to gradually bring the works up to their present capacity of about 35 million gallons a day. I have also advised and insisted upon the timely acquisition of the large, then available, but now enormously valuable watersheds, reservoir sites, water rights and rights of way in and from the mountains and valleys surrounding the bay.

"In the second half of the sixties, building the Pilarcitos Reservoir and its new conduit into San Francisco; and, in the latter part of the sixties and early in the seventies, building the San Andres Dam and its independent pipe line. Both of these reservoirs were, some years later, increased in capacity by raising the two dams.

"In the middle of the seventies we constructed the upper Crystal Springs Reservoir and, a few years later, connected the same by a pumping plant, pipe and flume line with the Pilarcitos conduit, thus adding the upper Crystal Springs water to our city water supply.

"About the same time we acquired land and water rights at Lake Merced, in San Francisco County, and erected a pumping plant on the north lake and connected the same (which controlled the north lake and the outflow from the south lake), by a pipe line, with our San Andres main conduit line, delivering water into College Hill Reservoir.

"In 1885 we constructed the 44-inch wrought-iron Crystal Springs pipe line from the upper Crystal Springs Reservoir to the new University Mound Reservoir, into the city, thus sending a much larger supply from this important source into San Francisco by gravitation, instead of pumping as theretofore.

"In 1888 we completed the original Alameda Creek works as far as the 44-inch Crystal Springs pipe, near Burlingame, with double 16-inch submarine pipes crossing the bay.

"At this period we also completed the original Belmont pumping plant, thus adding to our works the magnificent Alameda properties, which holdings have since been

largely added to and part of their resources developed.

"In 1887 we laid the foundation of the concrete Crystal Springs main dam and, by working on the same during 1887, 1888 and 1890, we raised it to its present height of 145 feet above its base, which is 280 feet above tide. The 44-inch Crystal Springs pipe was disconnected from the upper dam and, instead, connected (as originally contemplated) with the lower main dam.

"In 1897 the Pilarcitos pumps were constructed, forcing San Andres water into the Pilarcitos pipe line.

"In 1898 we completed the Crystal Springs emergency pumping station, with conduit to San Andres Reservoir, and also the Millbrae pumping station. The latter can deliver either Alameda or Crystal Springs water into the higher San Andres pipe line.

"In 1900 we completed the Sunol filter beds and Sunol Aqueduct, on the Alameda Creek system, largely increasing the capacity of the original Alameda works and also, by filtration, improving the quality of the water. These filter beds also received the water from our extensive artesian lands in Livermore Valley.

"During 1902 we constructed the second double line of submarine pipes across the bay, these lines being 22 inches, while the original lines are 16 inches in diameter. Thus we considerably again increased the carrying capacity of the Alameda conduit.

"This was followed, in 1903, by our more than doubling the capacity of the Belmont pumping plant and, at the same time, laying the 54-inch Alameda pipe line from the Burlingame junction of the Crystal Springs and Alameda pipe line to the Millbrae Pumping Station.

"At the latter place we had also, since 1898, established a large central and effective emergency camp, for the purpose of rapidly repairing any part of the main works, should it become necessary.

"This camp stood us in good stead immediately after the disaster of 1906, as without the great variety of almost every kind of repair fittings kept on hand there much more time would have elapsed in repairing the damage done to the San Andres and Crystal Springs main pipe lines.

"During the period of 40 years, from 1865 to 1905, the population and consump-



Fred C. Herrmann

tion of water in San Francisco gradually and steadily grew, and, naturally, required an enormous extension of the city distributing reservoir and pipe system. Water was required and demanded everywhere, and at elevations varying from the sea-level up to over 500 feet above tide.

"By the end of the year 1905, we had distributing pipes of a total length of 441½ miles, laid and in operation in the City of San Francisco."

In thus sketching his Spring Valley activities, Schussler left it to the reader to measure his achievements against the background of the period during which he worked. So measured, Schussler's work is found to be as bold and daring as that of any of his contemporary engineers. His design for the Crystal Springs concrete dam was for a higher dam than had theretofore been built, and while the dam was not at that time carried so high, his design excited wide-spread admiration.

In his report of 1917 upon the Spring Valley rate cases, Master in Chancery H. M. Wright quoted with approval the following words of Allen Hazen, an engineer witness:

"The design of the structures of the company is good. I do not think I have ever examined an old system of waterworks which showed such continuity of purpose as is shown by the works of this company. The metal was well arranged in the pipes; the riveting was good; the thicknesses were closely calculated. The reservoirs and dams were well built, tight. The tunnels are of good workmanship. The distribution system is well designed and of good material and appears to be remarkably tight. The whole system reflects great credit on those who have been responsible for its extension through a long term of years. The works were laid out with a view to future development, and the whole system has been planned so that added units could be built and worked into the system as required from time to time. The number of structures which have been discarded during the years gone by I think is low. That has been due partly to the fact that the structures have been very durable ones, and in part to the fact that the design has been carefully arranged to anticipate growth and to serve for a long period."

And the Master added: "This favorable comment is a tribute to the engineering skill of Hermann Schussler, and it is refreshing to observe that the city's engineer witnesses join with Hazen in this generous praise."

Following the disaster of 1906, Schussler was engaged in restoring water service to normal conditions. In 1908 he resigned his position as Chief Engineer, but continued private practice until his death, in 1919.

During his years with Spring Valley he had accepted many outside commissions. He triangulated and corrected the alignment of the Sutro Tunnel in Nevada. For the Hawaiian Commercial Company he constructed on Maui in the Hawaiian Islands a score of inverted syphons across the same number of valleys. Among his services to the mines of California was the construction of the La Grange Canal, the first permanent diversion from the Tuolumne River.

Worthy of special mention is the fact that in 1872 he built for the Virginia City Water Company in Nevada a pipe-line with maximum pressure of 1750 feet, a pioneering achievement in high-pressure pipe-lines.

In July, 1905, President Roosevelt offered him a place on the Board of Consulting Engineers to consider plans for a Panama

Canal, but this appointment he declined "on account," to use his own words, "of previous engagements and undertakings."

III

The outstanding development of Spring Valley Water Company at the beginning of the present century was centered in that border region of Alameda and Santa Clara counties where the Calaveras Reservoir now spreads its pleasant waters. It had been envisaged as a practicable development of the San Francisco water supply—and purchases of land to make it feasible had been consummated—as early as 1875. The increasing water demands of our city in the first decade after 1900 made it imperative that this watershed be brought under control, and Fred C. Herrmann was engaged to make the necessary engineering explorations.

Fred C. Herrmann, third in the roll of Spring Valley's chief engineers, was born in San Jose, California, August 30, 1870. He belongs to a family of distinguished engineers. His father, A. T. Herrmann, and his uncle, Carl Herrmann—Herrmann Bros.—had been established in San Jose as civil engineers since the sixties, and had many engineering achievements to their credit in central California.

Fred C. Herrmann was graduated in civil engineering at the University of California in 1894. After working for three years with Herrmann Bros., he was engaged by the Spreckels Sugar Company to develop water supplies for the irrigation of sugar beets in the Salinas and Santa Clara valleys and about Castroville.

From this work he went in 1900 to the service of the City of San Francisco as assistant to City Engineer C. E. Grunsky, his chief activity being the planning and installation of a new sewer system.

From 1905 to 1907 he was engineer in charge of irrigation and drainage investigations for the Rocky Mountain states under the Department of Agriculture.

In 1907 he was called to Imperial Valley to assist H. T. Cory in the "second closing" of the Colorado River. Following this work he remained in the Imperial Valley for three years as chief engineer under Epes Randolph in the reconstruction of the Imperial Valley irrigation system.

In 1910 Mr. Herrmann was retained by

Spring Valley Water Company as construction engineer on the Calaveras project. He supervised the explorations that were made at that time, and cooperated with William Mulholland of Los Angeles in designing the dam.

Fred C. Herrmann was appointed chief engineer of Spring Valley in 1911. During his regime the construction of Calaveras Dam was started with sluicing operations and the building of the outlet tunnel.

A booster plant for the trans-bay pipeline was built at Ravenswood, and another for the Crystal Springs-San Andres line.

During this period also the Central pumping station was built in San Francisco under the supervision of George A. Elliott, who was then Superintendent of City Distribution.

Herrmann also made complete studies of pipe-bearing capacities for the system, designed dams for San Antonio and Arroyo Valle in the Alameda division, and prepared a special report for the Secretary of the Interior on the development of the coast streams controlled by the Company.

By raising the parapet of Crystal Springs Dam four feet in 1911, he saved the City a year's supply of water.

It was during his incumbency that Spring Valley prepared for submission to the Interior Department the monumental volume entitled "The Future Water Supply of San Francisco," one of the most exhaustive reports of the kind ever compiled.

He relinquished the position of Spring Valley's chief engineer in 1914, but subsequently rendered the company valuable service as a consultant during the Rate Case of 1915-1917.

Since 1914 Mr. Herrmann has engaged in general practice as a consulting engineer. Among the water companies for which he has acted are the East Bay, the San Jose, and the Benicia. He reconstructed the Modesto Irrigation District, rebuilding the Dallas-Warner dams and installing permanent waterways and structures throughout the system.

He has been consulting engineer for the State of California in its Water Resources investigation, and for the State Reclamation Board in the preparation of plans for flood control in the Sacramento Valley. In the same capacity he served the Jefferson County (Oregon) Conservancy District on the Deschutes River project, the San Joaquin River



George A. Elliott

Water Storage District, and the Kern River Water Storage District. He was one of three engineers called upon to examine into the safety of all Los Angeles City dams, following the failure of the St. Francis Dam.

And to round out this list of Mr. Herrmann's major activities, he has just completed a report on the Orange County flood control project, a project that involves the construction of eight dams to cost sixteen million dollars.

IV

In 1914, when George A. Elliott succeeded Fred C. Herrmann as Chief Engineer, Spring Valley Water Company had 63,016 service connections. He has seen the number grow to 107,146. The average daily consumption in 1914 was thirty-eight million gallons—it has increased to fifty millions. And he has built up the distributing mains from 455 to 766 miles of pipe. The development of additional water supply, together with all the necessary facilities to store, transmit, and distribute it, have been provided well in advance of immediate needs. Under him construction expenditures have totaled \$13,500,000.

Mr. Elliott has helped to carry Spring Valley through difficult years—years of litigation over rates; years when expansion of the system, though imperative, was hampered by the financial condition of the Company; years when rainfall dropped far below normal, and drastic emergency measures were adopted in order to make the available water "go round." And he carried on during the conditions brought about by World War.

It was under his direction that the universal metering of San Francisco was carried through, a step that widened the margin between supply and use sufficiently to allay, though not to eliminate, anxiety as to the future. The installation of meters for domestic consumers—commercial accounts were metered already—began in 1916, and was completed in 1918, at a cost of \$575,000. The instant effect was a saving of ten million gallons daily and the improvement of pressure conditions generally throughout the city.

Mr. Elliott saw the regulation of the Company's rates pass from the Board of Supervisors of San Francisco to the Railroad Commission of California, a change with far-reaching consequences.

In 1921 the Railroad Commission took the lead in providing a plan whereby the water supply could be developed by Spring Valley in conjunction with the City's Hetch Hetchy project. Spring Valley was directed to raise Calaveras Dam and to build other structures so as to increase the supply of water from the Alameda Division by twenty-four million gallons daily, this water to be delivered to Crystal Springs Reservoir through the Bay Division of the Hetch Hetchy aqueduct under a rental arrangement. This program involved, besides the work at Calaveras, the construction of a new and larger conduit from Sunol to Niles, of a regulating reservoir at Niles, and of a pipeline from Niles to Irvington, where the Bay Division of the Hetch Hetchy began.

In 1923 Mr. Elliott commenced the excavation and placing of 800,000 cubic yards of rock and earth at Calaveras Dam. At that time there were six and a half billion gallons of water in the reservoir, though its total capacity was eight billions. When the Calaveras work was completed, in 1925, the dam had been carried to a height of 220 feet above bedrock, giving a reservoir capacity of nearly thirty-three billion gallons.

The old Sunol-Niles aqueduct was replaced by a reinforced concrete structure. The conduit now consists of concrete-lined tunnels and a concrete aqueduct with a capacity of seventy million gallons daily. At the same time a regulating reservoir was built at Niles for the purpose of balancing the flow of the aqueduct into the Niles-Irvington pipe-line as well as into the existing transmission lines. This is an excavated reservoir lined with concrete and roofed with wood, its capacity being five million gallons. Another element of this work was the laying of some 16,000 feet of 44-inch pipe from Niles to the junction at Irvington with the City's line.

Beginning in 1923, the city distributing system was greatly improved by extensions to newly developed districts and by replacement of small with larger mains.

In the same year a five-million-gallon unit of a new city reservoir was constructed on Stanford Heights. This reservoir, providing storage for the important districts south and west of Twin Peaks, and supplementing the storage at Clarendon Heights, has since been completed to a total capacity of eleven million gallons. By raising the embankment of University Mound Reservoir, the storage of water for the downtown business and shopping district was increased from forty-two to fifty-nine million gallons.

Writing in the early part of 1924 about Chief Engineer Elliott and these major activities, President Eastman said:

"The construction work carried on during the last two and one-half years has improved distributing conditions to a great extent. It has not only relieved the individual necessities of various limited areas which required larger pipes or greater pressure, but the type of work has been of such a nature that it will in many instances be the foundation upon which future construction and expansion will be based. The increased reservoir capacity and storage at higher elevations now completed fill not only the necessities of the present, but will permit many miles of tributary pipe to be laid before they will need further reinforcing. Similarly much of the pipe work consisted of mains of major size, which were laid in such locations as to permit of the extension of the distributing pipe system to a large extent without additional transmission lines."

In 1925 Chief Engineer Elliott laid a new

pipe-line, varying in size from 36 to 16 inches, from Laguna Honda distributing reservoir across Golden Gate Park to the Richmond District and down California Street to Franklin. This had the effect of improving pressure and service conditions in a section that consumes forty-five per cent of the water used in San Francisco, including Western Addition, Richmond, and Sunset.

In 1925 construction began on an entirely new pipe-line from Lake San Andres in San Mateo County to Laguna Honda. This important addition to transmission facilities is a 54-inch line 58,000 feet long, and was completed in July of 1928. The result was that all pumps supplying Lake Honda, with the exception of the City Pump Station, were retired from use. At this same time the second unit of Stanford Heights Reservoir was built, providing a storage of eleven million gallons at an elevation of 620 feet. Simultaneously a new feeder main 31,000 feet long was laid from Central Pumps to Stanford Heights Reservoir, and from Stanford Heights to the Presidio Heights district, which is the area lying along the ridge from Nob Hill west. This retired from service the historic Black Point Pumps. The entire program cost more than a million and a half.

It must be apparent that Mr. Elliott has occupied the office of Chief Engineer during a period of intensive engineering activity in Spring Valley. While the most important projects have been mentioned, there have been many others demanding his attention. The artesian sources near Pleasanton, in Alameda County, have been greatly developed. Work has proceeded on the construction of the Upper Alameda Tunnel through which the run-off of a large drainage area will be transported to Calaveras Reservoir. In fact, there has been no part of Spring Valley that has not needed radical changes or betterments during Mr. Elliott's time.

George A. Elliott was born at Wellington, New Zealand, on the 21st of October, 1880. He studied engineering for two years at the University of California, completing his course and taking his degree at the University of Colorado in 1904. After service with the General Electric Company at Schenectady, he returned to the Pacific Coast and was engaged to install transmission lines for both Pacific Gas and Electric and the Great Western Power [Concluded on page 111]

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IT seemed fitting, while recording in SAN FRANCISCO WATER the placing of a memorial to Hermann Schussler, that tribute should be paid also to the chief engineer who preceded, and the two chief engineers who have followed him in the direction of San Francisco's water supply. Hence the theme running through this issue of our magazine, and the attempt to estimate the importance of a Von Schmidt, a Herrmann, and an Elliott, as well as of a Schussler.

None of these men would dream of monopolizing the credit for the great things accomplished during his regime. Successful engineering is, to a very marked degree, a matter of team work. It depends upon organized effort, intelligent cooperation, the fitting into one pattern of many delicately contrived pieces.

To go no farther back than the incumbency of Chief Engineer Elliott, Spring Valley offers a conspicuous example of this team-work in engineering. Justice, much more than generosity, calls for honorable mention here of six Spring Valley men who have rendered high service to their Company and to their Chief Engineer. And so we salute John J. Sharon, George W. Pracy, T. W. Espy, George J. Davis, A. W. Ebright, and I. E. Flaa.

The Spring Valley services of Mr. Sharon began under Hermann Schussler, and are distinguished for their versatility as well as brilliance. No other executive of the Company is so thoroughly informed in all its ramifications—engineering, financial, statistical, and historical. He is the Company's Secretary and Auditor.

For fifteen years Mr. Pracy has run the distributing system of the Company, achieving fine results in a position of unusual difficulty, for Spring Valley's distributing system is one of the most complex in America.

Mr. Espy, Assistant Chief Engineer, has

been in charge of construction work outside of San Francisco during a period of intensive activity, and has won many encomiums.

Mr. Davis and Mr. Ebright are charged, respectively, with the operation of the Peninsula and Alameda water divisions, and have thus played important rôles in the delivery of water to San Francisco.

As Office Engineer Mr. Flaa has had entire charge of design for all structures, as well as of hydrographic practice.

Spring Valley Lakes

THREE silvery pendants on a chain of emerald and gold,

The lakes along the Skyline Drive, like tender buds, unfold.

Around a curve they leap in view, a tiny glimpse of each,

As if to lure you on and on, but always out of reach.

Through fronds of green they sparkle there, and then they disappear

Until another bend is reached—again the vision's clear!

Another turn—they flit away to mock the anxious eye;

Then comes the open road and there, serenely calm, they lie!

Between the rows of smiling hills, in cups of glistening jade,

Their nectar of Olympus cools within the grateful shade.

And though a barrier holds aloof the thirsty from the brink,

The famished eyes bend down and take a splendid quenching drink!

—Miles Overholt, in *S. F. Examiner*, July 5, 1929.

Four Spring Valley Engineers

[Continued from page 10] Company. He joined Spring Valley in 1909 as superintendent of city distribution. Appointed Chief Engineer in 1914, he was made Vice-President in 1925, and General Manager in 1928.

He was supervising engineer for the construction of Camp Fremont, and of the T. N. T. Plant at Giant, California. He is consulting engineer for the San Jose Water Works, and a member of the board of engineers serving the state in investigation of water resources and in preparation of a coordinated plan for their conservation and use.

Engineers and the Science of Hydraulics: A Dialogue

By the Editor

[The characters are *Technicus*, a hydraulic engineer, and *Sillicus*, a layman. *Technicus* is a handsome man, clothed in garments of perfect taste and quiet luxury. His face mirrors superior intelligence and deep spirituality. The blue button of the Society is the only thing approaching gaudy ornament in his attire. He is smoking expensive cigars, lighting one from the other. His words are carefully chosen, and his talk is enlivened with wit, humor, and metaphor. In other words, he is a typical engineer. *Sillicus* has nothing to distinguish him—he is just a layman. This dialogue takes place in the inner office of the magnificent suite maintained by *Technicus*. As the day's professional duties have been discharged, there is no telephone or other interruption to fear.]

SILLICUS: Is it not true that Cain was the first engineer?

Technicus: I doubt whether you have Biblical warrant for that statement. Are you not trying to be offensive?

Sillicus: Not in the least. My veneration for engineers is as profound as my respect for the truth of history.

Technicus: Then I am at a loss to understand how you connect the first murderer with our profession.

Sillicus: Need I refer you to Genesis? You are an engineer of all-round culture; so you must know your Bible.

Technicus: Ahem!

Sillicus: My authority is Genesis iv, 17, where we read of Cain: "And he builded a city, and called the name of the city, after the name of his son, Enoch." Now, if Cain built the first city, he must have been the first engineer, since the building of a city involves a number of engineering problems.

Technicus: Even if it were so, I doubt whether the Society would go the length of honoring Cain. His position in history is not an enviable one—not to be compared, for instance, with that of his kinsman Tubal Cain, who, according to the same account, was the father of music. Furthermore, I question whether the first city-planner originated the profession of engineering. I think it extremely likely that Adam was the first of the engineers.

Sillicus: Adam? The first orchardist, the

first farmer, if you will—but the first engineer—

Technicus: Exactly. Do you not suppose that problems of water supply arose as soon as the first man and woman went forth to earn their bread in the sweat of their brows? Water to drink, water for cooking and washing, water to irrigate the first planted field and orchard—Adam and Eve faced water problems as soon as the gates of Paradise closed behind them. I venture to say that Adam was anxiously measuring rainfall before the first winter was half over.

Sillicus: Your theory is ingenious, at least. Then I suppose that you engineers, and particularly you hydraulic engineers, revere Adam as the founder of your science?

Technicus: No, indeed; and for the simple reason that we insist on fact, not theory. Adam may have been all that I have mentioned, but we are not sure. The man we honor when we turn to the Old Testament is Moses.

Sillicus: Moses the law-giver? Have not the lawyers a superior claim on him?

Technicus: I am not so sure. Remember that the Decalogue says, "Thou shalt not steal"! But let me not gibe at the lawyers, just because they have the courage to charge more than engineers. It was not Moses the law-giver I had in mind; it was Moses the water-giver. Let me show you that I too can quote Scripture:

"There was no water for the people to drink.

"Wherefore the people did chide with Moses, and said, Give us water that we may drink. And Moses said unto them, Why chide ye with me? Wherefore do ye tempt the Lord?

"And the people thirsted there for water; and the people murmured against Moses, and said, Wherefore is this that thou hast brought us up out of Egypt, to kill us and our children and our cattle with thirst?

"And Moses cried unto the Lord, saying, What shall I do unto this people? They be almost ready to stone me.

"And the Lord said unto Moses, Go on before the people, and take with thee of the elders of Israel; and thy rod wherewith thou smotest the river, take in thine hand, and go.

"Behold, I will stand before thee there upon

the rock in Horeb; and thou shalt smite the rock, and there shall come water out of it, that the people may drink. And Moses did so in the sight of the elders of Israel."

Picture the scene. The desert near Sinai, the region we know so well nowadays since we have all been reading Charles Doughty's *Arabia Deserta*. Those vast multitudes who had left behind them the fleshpots and the abundant water supply of Egypt. They murmured, and what a murmur that must have been—like the roar of a hundred Niagaras! And that grand leader of theirs strikes the rock of Horeb and the water gushes forth. There is the man we revere—revere and envy—a hydraulic engineer who received the direct help of Heaven!

Sillicus: From the way you speak I infer that you place hydraulic engineering above the other branches of the profession.

Technicus: Well, it is the branch I practice; so perhaps I may be forgiven for my partiality. There is another great character of the Old Testament that we hydraulic engineers like to honor.

Sillicus: Who is that? Noah?

Technicus: Noah was not a hydraulic engineer. He was a marine engineer and navigator. The man I refer to was the prophet Elijah.

Sillicus: You puzzle me. I had never connected the gift of prophecy with your profession.

Technicus: It is quite true that we are not prophets. Neither are we honored as we should be—at least until after we are dead. It is not as a prophet that we claim Elijah, but as a bringer of rain from Heaven. Let me carry you to Mount Carmel. The priests of Baal are trying to vindicate their false and unclean cult. It is a critical moment in the history of true religion. The multitudes are not murmuring now—they are waiting in awe-struck silence. The great prophet prays. The heavens are opened, and the fire withheld from the altar of the priests of Baal consumes the sacrifice of Elijah. If you know this part of the first book of Kings, you remember that there had been a dreadful drought upon the land. But after the discomfiture and punishment of the priests of Baal note what happened:

"And Elijah said unto Ahab, Get thee up, eat and drink; for there is a sound of abundance of rain.

"So Ahab went up to eat and to drink. And

Elijah went up to the top of Carmel; and he cast himself down upon the earth, and put his face between his knees.

"And said to his servant, Go up now, look toward the sea. And he went up, and looked, and said, There is nothing. And he said, Go again seven times.

"And it came to pass the seventh time, that he said, Behold, there ariseth a little cloud out of the sea, like a man's hand. And he said, Go up, say unto Ahab, Prepare thy chariot, and get thee down, that the rain stop thee now.

"And it came to pass in the meanwhile, that the heaven was black with clouds and wind, and there was a great rain."

Sillicus: Was it not Elijah who was caught up into Heaven in a chariot of fire?

Technicus: Exactly. And all good hydraulic engineers hope to meet him there.

Sillicus: I did not know that there was so much piety among you. Usually you conceal it effectually.

Technicus: Perhaps we do not cast pearls before swine.

Sillicus: Ahem!

Technicus: The great engineers have been good men. Take the pagan Archimedes. When he was slaughtered at the capture of Syracuse by a Roman soldier, the conqueror Marcellus mourned him as a loss to the whole civilized world.

Sillicus: Archimedes? He was the chap who ran about the streets shouting "Eureka," wasn't he? What did he shout "Eureka" for?

Technicus: The word is on the state seal of California. I should think that every Californian, for that reason alone, would familiarize himself with one of the great water stories of history.

Sillicus: Another water story? Let's have it.

Technicus: Here it is in the language of an ancient Roman writer:

"Though Archimedes discovered many curious matters which evince great intelligence, that which I am about to mention is the most extraordinary. Hiero, when he obtained the regal power in Syracuse, having, on the fortunate turn of his affairs, decreed a votive crown of gold to be placed in a certain temple to the immortal gods, commanded it to be made of great value, and assigned an appropriate weight of gold to the manufacturer. He, in due time, presented the work to the king, beautifully wrought, and the weight appeared to correspond with that of the gold which had been assigned for it. But a report having been circulated, that some of the gold had been abstracted, and that the deficiency thus caused had been supplied by silver, Hiero was indignant at the fraud, and, unacquainted with

the method by which the theft might be detected, requested Archimedes would undertake to give it his attention. Charged with this commission, he by chance went to a bath, and being in the vessel, perceived that, as his body became immersed, the water ran out of the vessel. Whence, catching at the method to be adopted for the solution of the proposition, he immediately followed it up, leapt out of the vessel in joy, and returning home naked, cried out with a loud voice that he had found that of which he was in search, for he continued exclaiming, in Greek, *εὕρηκα*, (I have found it out). After this, he is said to have taken two masses, each of a weight equal to that of the crown, one of them of gold and the other of silver. Having prepared them, he filled a large vase with water up to the brim, wherein he placed the mass of silver, which caused as much water to run out as was equal to the bulk thereof. The mass being then taken out, he poured in by measure as much water as was required to fill the vase once more to the brim. By these means he found what quantity of water was equal to a certain weight of silver. He then placed the mass of gold in the vessel, and, on taking it out, found that the water which ran over was less, because, the magnitude of the gold mass was smaller than that containing the same weight of silver. After again filling the vase by measure, he put the crown itself in, and discovered that more water ran over than with the mass of gold that was equal to it in weight; and thus, from the superfluous quantity of water carried over the brim by the immersion of the crown, more than that displaced by the mass, he found, by calculation, the quantity of silver mixed with the gold, and made manifest the fraud of the manufacturer."

Sillicus: A most interesting story.

Technicus: And basic in the science of hydrostatics. In hydraulics Archimedes gave us the water-screw for raising water. I suppose that invention did more for irrigation than any that has followed. If I mistake not, it is still used along the Nile.

Sillicus: I am reminded of what a poet says:

"All the inventions that the world contains,
Were not by reason first found out, nor brains;
But pass for theirs who had the luck to light
Upon them by mistake or oversight."

Technicus: A very superficial comment. Perhaps Archimedes had what is called luck when he spilled the water of the bath; but he had a mind of the keenest acuteness, refined by mathematical exercise, and capable of the leap from theory to practical application. Take a look at his extant works in mathematics, and you'll begin to respect him as he deserves.

Sillicus: Are the writings of Archimedes still in existence?

Technicus: They are indeed, and the Greek text fills a good-sized volume. I do not think that they have been translated into English in their entirety. It is a task that awaits a genius, for the translator must be a profound student of Greek and of mathematics. The work of Mr. and Mrs. Herbert Hoover in translating Agricola's *De Re Metallica* was much easier of accomplishment than would be that of translating Archimedes.

Sillicus: From what book did you read that "Eureka" story?

Technicus: From Vitruvius, a Roman of the Augustan age, who wrote a treatise on architecture. He has a great deal to say about water and the science of hydraulics. That he had a proper appreciation of water as the gift of Heaven you may infer from these words:

"Water is of infinite utility to us, not only as affording drink, but for a great number of purposes in life; and it is furnished to us gratuitously. Hence the priests of the Egyptian worship teach that all things are composed of water; and when they cover the vase of water, which is borne to the temple with the most solemn reverence, kneeling on the earth, with their hands raised to heaven, they return thanks to divine goodness for its creation."

Sillicus: Very good, all except his saying that water is furnished gratuitously.

Technicus: We know what he meant. Of course, the ancients paid for water, as we do. The prophet Jeremiah noted that fact in Israel. And from Frontinus, who was superintendent of the Roman water supply under Trajan, we know just how water was measured. We know, too, from him, of the tricks used to get water for nothing, thus cheating the government.

Sillicus: Have you any more good water stories?

Technicus: Here is another from Vitruvius—one that is little known. Let me read it:

"Dinocrates, the architect, relying on the powers of his skill and ingenuity, whilst Alexander was in the midst of his conquests, set out from Macedonia to the army, desirous of gaining the commendation of his sovereign. That his introduction to the royal presence might be facilitated, he obtained letters from his countrymen and relations to men of the first rank and nobility about the king's person; by whom being kindly received, he besought them to take the earliest opportunity of accomplishing his wish. They promised fairly, but were slow in performing; waiting, as they alleged, for a proper occasion. Thinking, however, they de-

ferred this without just grounds, he took his own course for the object he had in view. He was, I should state, a man of tall stature, pleasing countenance, and altogether of dignified appearance. Trusting to the gifts with which nature had thus endowed him, he put off his ordinary clothing, and having anointed himself with oil, crowned his head with a wreath of poplar, slung a lion's skin across his left shoulder, and carrying a large club in his right hand, he sallied forth to the royal tribunal, at a period when the king was dispensing justice. The novelty of his appearance excited the attention of the people; and Alexander soon discovering, with astonishment, the object of their curiosity, ordered the crowd to make way for him, and demanded to know who he was. 'A Macedonian architect,' replied Dinocrates, 'who suggests schemes and designs worthy your royal renown. I propose to form Mount Athos into the statue of a man holding a spacious city in his left hand, and in his right a huge vase, into which shall be collected all the streams of the mountain, which shall thence be poured into the sea.' Alexander, delighted at the proposition, made immediate inquiry if the soil of the neighborhood were of a quality capable of yielding sufficient produce for such a state. When, however, he found that all its supplies must be furnished by sea, he thus addressed Dinocrates: 'I admire the grand outline of your scheme, and am well pleased with it; but I am of opinion he would be much to blame who planted a colony on such a spot. For as an infant is nourished by the milk of its mother, depending thereon for its progress to maturity, so a city depends on the fertility of the country surrounding it for its riches, its strength in population, and not less for its defense against an enemy. Though your plan might be carried into execution, yet I think it impolitic. I nevertheless request your attendance on me, that I may otherwise avail myself of your ingenuity.' From that time Dinocrates was in constant attendance on the king, and followed him into Egypt; where Alexander having perceived a spot, at the same time naturally strong, the center of the commerce of the country, a land abounding with corn, and having those facilities of transport which the Nile afforded, ordered Dinocrates to build a city whose name should be Alexandria."

Sillicus: That's an amazing story. Think of an architect in those ancient times proposing to sculpture a whole mountain! Truly, there must have been great architects in those days.

Technicus: And great engineers. Suppose Alexander had approved the project and Dinocrates had gone ahead. The water part of his scheme would have employed all the hydraulic engineers he could find. Think of gathering together all the streams that flow down Athos and pouring their combined

waters into the sea. The magnitude of the thing is astonishing.

Sillicus: But a good engineer would not waste all that water.

Technicus: True, and perhaps Dinocrates meant to put it to work before he poured it in libation to Father Neptune. We know something of the engineering achievements of those days, but there is much that we can only surmise. Surely they did great things with water power. As you know, the irrigation systems of Mesopotamia antedate written history. But who originated them we shall probably never know. It is too bad. Another hydraulic genius whose name I should like to know was the man who devised a watering system for the Hanging Gardens of Babylon.

Sillicus: Perhaps the Babylonian king depended on rainfall to water his suspended gardens.

Technicus: He couldn't. There is very little rain in the region where mighty Babylon once stood. That country depended on the annual overflow of the Euphrates almost as much as Egypt depended on the Nile. There were great hydraulic engineers at Babylon—would that we knew their names! They bestowed stupendous labor on the Euphrates. They built embankments or levees to restrain the river, huge reservoirs to impound its surplus waters, curvilinear channels in places where the stream was too straight and too rapid, while broad, deep canals, or irrigation ditches, traversed all the region between the Euphrates and the Tigris. The result of these engineering feats was that the Babylonian soil was watered to an almost incredible richness.

Sillicus: And we don't know the engineers who did all this?

Technicus: We know the names of the rulers under whom it was done. The king took all the credit. It probably never occurred to him that his engineer was worthy of commemoration. As you perhaps know, the Euphrates flowed through the city of Babylon. Along the banks, inside the walls, spacious quays were built. In order to accomplish this construction Queen Semiramis caused the Euphrates to be drained off temporarily into a huge lake, or reservoir, built further upstream. The historians give Semiramis the credit, doubtless because they could not ascertain the names of her engineers.

Sillicus: Where did those ancients get their skilled labor?

Technicus: Of course, there must have been highly skilled overseers, but the hard work was done by legions of slaves. There was no labor problem as long as the slaves poured into Babylon when the conquering armies came home from war. In this connection the historian Grote makes what seems to me a very serious misstatement. He says: "That which strikes us most, and which must have struck the first Grecian visitors much more, both in Assyria and Egypt, is the unbounded command of naked human strength possessed by these early kings, and the effect of mere mass and indefatigable perseverance, unaided either by theory or by artifice, in the accomplishment of gigantic results." It seems to me simply ridiculous to say that those great builders had neither theory nor artifice. Their works—what remains of them—prove conclusively that they had both in a distinguished degree. Grote was a careful historian, but he should have consulted an engineer before he wrote that. And on the same page he returns to the matter in these words: "Even during the Homeric period of Greece, these countries had attained a certain civilization in mass, without the acquisition of any high mental qualities or the development of any individual genius." That strikes me as being nonsense. It is as much as to say that they builded better than they knew, which has never been true and never will be. When we read in Herodotus and other ancient historians of the great achievements in hydraulics (to go no further) that made Babylon the wonder of the world, we must close our minds to basic ideas if we are content to say that there was no individual genius, no high mental quality behind these achievements. If a writer of today said the same thing about the construction of the Panama Canal he would be laughed at. The trouble is that in peering back at remote antiquity we are liable to think of the men of those ages as being different from the men of today. True, they hadn't all the science we have, but they had a remarkable grasp on a lot of it.

Sillicus: That is a generous statement, and sounds to me like a reasonable one.

Technicus: I trust I have at least persuaded you that ours is an ancient and hon-

orable profession. There are great names in our roll of honor. Did you know that Leonardo da Vinci was a hydraulic engineer?

Sillicus: My ignorance is appalling. I know of him only as a painter.

Technicus: His writings show that da Vinci had a very clear knowledge of water laws. And in his later years he was the engineer for numerous river and irrigation projects in Italy.

Sillicus: So that he was not only a great painter, but a very wise man.

Technicus: Speaking of wise men, you remind me that Thales, one of the Seven Wise Men of Greece, who lived, perhaps (we cannot be sure), about 640-550 B.C., founded the earliest Grecian philosophy upon water. He taught that water was the single original element from which everything came and into which everything returned. "The doctrine of one eternal element, remaining always the same in its essence, but indefinitely variable in its manifestations to sense, was thus first introduced to the discussion of the Grecian public." So says a great modern admirer of Thales. And he adds that Thales taught that the earth rested on water.

Sillicus: I sincerely think that you should be a very happy man. You deal with the most appealing of God's natural gifts to mankind. Your work is with the mountain creek singing as it slips along beneath the trees, no less than with the mighty river carrying steamers upon its bosom. You respect yet transform the face of Nature, raising bulwarks across great gorges to dam and conserve. You have a deep understanding of storms and winds and the rainfall they control. You transmute valleys into lakes. You harness the fury of waterfalls. You send water on long journeys from remote hills to noisy cities. Yours is a benign influence—without you cities could not grow, could not indeed exist. Yet you are seldom acclaimed except by colleagues who can estimate the difficulties you have overcome, the ever-new phases of the old problems you have solved, and the beauty of the structures that you rear in the name of utility. As a layman, I humbly and sincerely salute the Hydraulic Engineer.

Technicus: You are a man of some discernment. Come and dine with me at the Engineers Club.

SPRING VALLEY WATER COMPANY

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ASSISTANT SUPERINTENDENT	S. M. Millard		
SUPERINTENDENT ALAMEDA SYSTEM	A. W. Ebright	PURCHASING AGENT	J. H. Le Pla

Δός μοι ποῦ στῶ και κινῶ τὴν γῆν.



IVE ME A
PLACE TO STAND
AND I WILL
MOVE THE EARTH

—ARCHIMEDES

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SAN FRANCISCO
Water

MAYORS OFFICE

SAN FRANCISCO

SAN FRANCISCO, CAL.

January 15th 1930.

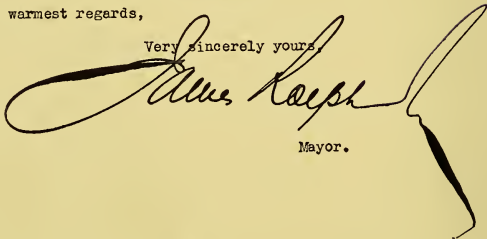
Mr. S. P. Eastman, President
Spring Valley Water Company,
425 Mason Street,
San Francisco, California.

Dear Mr. Eastman:

In order that there may be no anxiety on the part of the employees of the Spring Valley Water Company as to the continuance of their employment upon the transfer of the Spring Valley property to the city, I again assure you that, in compliance with the mandate of the Charter, all persons now employed in the operating service of the Spring Valley Water Company, who have been employed for not less than one year, will be retained in their positions after the transfer of the property of the Company to the City and County of San Francisco. All the city authorities who have been actively interested in the purchase of the Spring Valley Water Company join me in giving you this assurance. I expect the employees to be as happy under city employment as they have been in the past. I know of their faithful and efficient services to your Company in the past and please say to them that I trust that, in coming into the employ of the City and County of San Francisco, they will come with the confidence that their services to the city will be as much appreciated as they have been by their former employer. The city will depend upon them with like confidence for the successful operation of the project under city management.

With warmest regards,

Very sincerely yours,

A large, elegant handwritten signature in cursive script, reading "James R. Keefe". The signature is written in dark ink and is positioned to the right of the typed name "James R. Keefe".

Mayor.

SAN FRANCISCO WATER

PUBLISHED BY

SPRING VALLEY WATER COMPANY

SAN FRANCISCO, CALIFORNIA

VOLUME VIII

JANUARY, 1930

NUMBER 3

Valedictory

By S. P. Eastman, President

IN these closing days of Spring Valley Water Company as a public utility charged with the administration of San Francisco's water supply, it is gratifying to feel, and no less than just to express, the strength and integrity of the staff that has been responsible for the conduct of the business. These men, every one of them in full and responsible charge of his department, are all young men. They entered the Company's service with training that fitted them admirably for their work. With long, hard experience in the daily troubles and difficulties of water supply, they have risen to department management because they proved that they were the men best suited for the responsibilities involved.

Cities are generally located in convenient relation to water supply. Not so San Francisco. This city was built at the tip of a long peninsula so that it might dominate the world's greatest harbor. Water supply was wisely subordinated to waterway. The young city reared its business structures on made ground, and, as it grew, homes climbed more hills than Rome can boast. The hilliness of San Francisco, the presence of earthquake fault lines, and other handicaps complicated the engineering problem of bringing water from remote sources and intensified the general difficulties of distributing it.

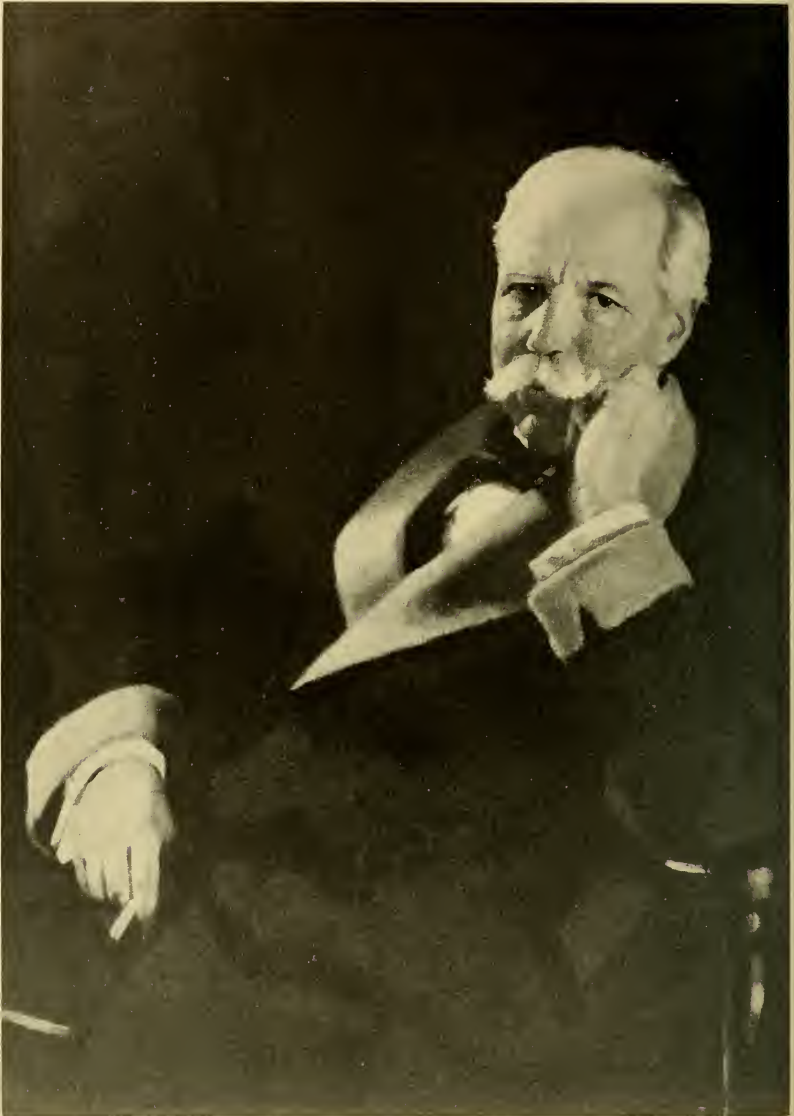
Stress is placed on the severe conditions surrounding San Francisco's water system—conditions much more severe than are encountered in other great American cities—because these conditions required, and will always require, unusual training, resourcefulness, and dependability in the operating staff.

G. A. Elliott, by education an engineer, grew up in the Company's affairs. He had charge, in positions of increasing responsibility, of the several physical departments of the Company. He is now the executive in charge of all departments, being Vice-President, Manager, and Chief Engineer. These responsibilities he handles with distinction.

George W. Pracy is superintendent of city distribution. In this position he has for years managed the most difficult distribution system of any large city in the world. In meeting the emergencies of water distribution there is frequently no time for the usual consultation of maps and office data. Action must be taken quickly and with reliable judgment. Herein Mr. Pracy has always been highly qualified, as he has courage and character.

All large water supplies must anticipate future needs, looking far beyond the horizon of today. There are also major construction emergencies to be met. Here T. W. Espy, assistant chief engineer, in his handling of the construction of Calaveras Dam, Sunol aqueduct, San Andres tunnel and pipe line, and many other large construction works, has shown ability and resourcefulness. Together with I. E. Flaa, office engineer in charge of design, he has been responsible for the completion of all structures built out of San Francisco during the past twenty years.

The storage and transmission system, with some twenty-five thousand acres of land in San Mateo County, together with the important interests of the Company in the Peninsula towns, is conscientiously administered by George J. Davis. Mr. Davis, by hearty co-operation in civic affairs, has always commanded the respect of [Concluded on page 14]



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(Died January 26, 1930)



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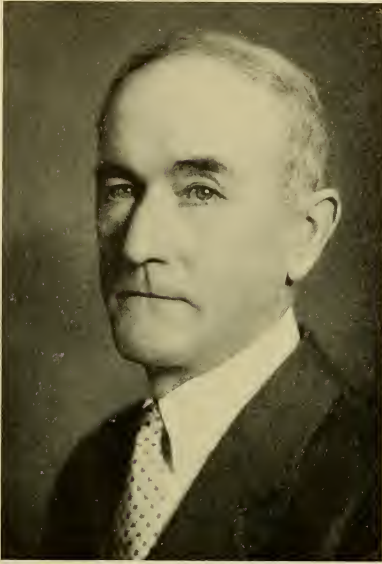
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J. E. HUNTOON, Assistant Supervisor, Consumers' Accounts



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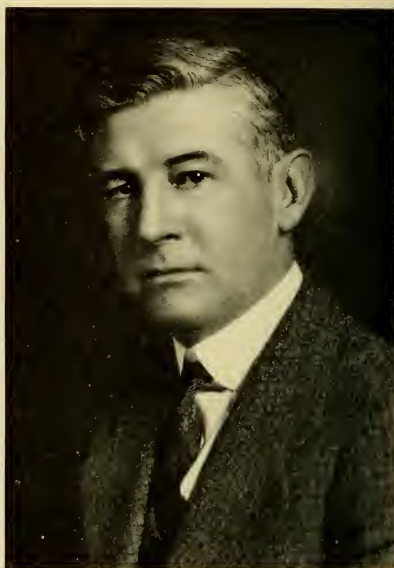
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EDWARD F. O'DAY, *Director of Publicity*



THEODORE J. WILDER, *Manager, Real Estate Department*



J. H. LEPLA, *Purchasing Agent*

Valedictory

[Continued from page 1] county and town officials in his division.

More than half of the city's present supply is developed in the Alameda County division of Spring Valley. Through that division will flow all of the city's future supply. This system for many years has been operated by A. W. Ebright; he has also represented with credit the interests of the Company in the county and towns of his division.

Beginning thirty-one years ago as a time-keeper, John J. Sharon became secretary to the late Hermann Schussler, acting as such for seven years. Passing on to the operating department, he was assistant superintendent of city distribution, then assistant engineer, during which time he was in charge among other things of raising the Crystal Springs Dam. Following this, Mr. Sharon was given the responsibility of preparing all material for the protracted rate litigation which lasted so many years, the construction of the Company's building on Mason Street, and va-

rious other major activities, all of which he handled with marked success. He is now Secretary and Auditor of the Company. In addition to his extensive general knowledge of Spring Valley records and history, he is one of the best-informed water-works men on the Pacific Coast.

Mr. Sharon's associate, D. W. Cooper, is an outstanding member of the auditing profession. He is a born analyst of accounting problems, thorough and accurate.

For many years, during normal times and construction emergencies, the engineering and department superintendents have had a thoroughly dependable and loyal ally in J. H. Le Pla, the purchasing agent. Mr. Le Pla is an excellent buyer, ably co-ordinating his work with the program under way, and he has always commanded the respect of selling houses.

Upon the Water Sales Department rests the duty of representing the Company in its daily contact with the public. To the consumer the Water Company is the employee who takes his order for a service, reads his

meter, collects his bill, or adjusts his complaint. The successful public relations of the Company are due in a large measure to the employees of this department under the direction of V. E. Perry, manager of water sales.

To F. W. Roeding this Company has been deeply indebted for the wise and expert handling of its agricultural department. In his personal no less than in his business relations with the Company's agricultural tenants Mr. Roeding has been invaluable, while his deep knowledge and the practical application of that knowledge have commanded the respect of all Californian agriculturists.

The real-estate activities of Spring Valley have taken on increasing importance year after year. They have been in the capable charge of Theodore J. Wilder, who has applied to his duties a wide knowledge of realty, sound judgment, and a conscientious understanding of fair dealing. He has been tireless in his service to the Company.

The integrity and ability conspicuously seen in the heads of Spring Valley departments are found likewise in the many assistants that make up department personnel. It is fully appreciated that as these assistants are efficient and loyal, every department head is aided in success and the accumulated benefits are passed on to the Company.

To the draughtsmen, clerical forces, special operators, bookkeepers, collectors, outside men—the service and pipe men, gatekeepers, reservoir attendants, pumping station crews, the distant watchmen—and other associates in the organization that collectively is the human force of Spring Valley Water Company, I desire to pay tribute and respect, and to give thanks for their individual records of loyal and useful service throughout the years.

* * *

MOST of the photographs in this number of SAN FRANCISCO WATER were made by George E. Fanning, official photographer for Spring Valley Water Company.

* * *

FOR the information of those who keep SAN FRANCISCO WATER, it may be mentioned that, by error, the preceding issue was numbered Vol. VIII, No. 2, instead of Vol. VIII, No. 1. Those who check their files and find no Vol. VIII, No. 1, will now understand why they miss it—it was never published.

SAN FRANCISCO WATER

PUBLISHED BY

SPRING VALLEY WATER COMPANY

SAN FRANCISCO, CALIFORNIA

425 Mason Street • Phone Prospect 7000

EDWARD F. O'DAY, Editor

VOL. VIII

JANUARY, 1930

No. 3

WITH this issue SAN FRANCISCO WATER comes to an end by reason of a major event in San Francisco history—the acquisition by the municipality of Spring Valley Water Company. Born in 1922, the magazine expires at the beginning of its ninth year—a tender age!—and doubtless there are those who will yield it the tribute of a regretful sigh. It has had a pleasant career. It has striven to be good, but acknowledges many failures due to human weakness. If it had its life to live over again—as the saying is—it would try to do better; but would it succeed? Of the friends it has made, it is very proud. And it is grateful for many words of appreciation generously spoken through the years.

Turning over its pages for self-examination, SAN FRANCISCO WATER finds here and there articles and pictures that are of more than passing interest. May these be the salt to save it from decay! May it survive on the bookshelves of those who liked it, and not gather too much dust!

To all its friends SAN FRANCISCO WATER bids a hearty Good-by.

* * *

OUR distinguished Editor, Edward F. O'Day, achieved a high standard in SAN FRANCISCO WATER. In friendship and admiration we reach for his hand—hoping thereby that we may touch the soul of Eddie O'Day, whom we all love.

S. P. EASTMAN,

President.

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SUPERINTENDENT ALAMEDA SYSTEM	A. W. Ebright		



THE WHOLE SUBJECT
OF AN INCREASED
WATER SUPPLY
OUGHT TO BE SUB-
MITTED TO THE
BOARD OF PUBLIC WORKS, WITH
THE VIEW OF MAKING IT A PUBLIC
ENTERPRISE TO BE OWNED BY
THE CITY.

MAYOR THOS. H. SELBY, 1871

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