

C-D 758

WATER SUPPLY OF SAN FRANCISCO. (CA. 1880)

HISTORY OF THE DEVELOPMENT OF SAN FRANCISCO'S
WATER SUPPLY, THE SAN FRANCISCO WATER WORKS AND
SPRING VALLEY WATER COMPANY.

WITH THIS: BRIEF BIOGRAPHICAL SKETCH OF CHARLES
WEBB HOWARD.

THE WATER SUPPLY OF SAN FRANCISCO.

Situate, as San Francisco is, on the extreme point of a long and narrow peninsula ; cut off by the waters of the sea, as they flow in through the Golden Gate and for thirty miles or more up the Bay, from access to all the fresh water streams of the State ; in a climate where there is no appreciable rain fall for eight months in the year, and on a soil that retains but a very small proportion of the water that falls upon it, the question of water supply for the use of its inhabitants has been one of most serious moment, and the problem of securing that supply one of difficult solution. It has taxed the ingenuity of many of her ablest citizens, and involved an expenditure which the municipality ~~was~~ has never yet consented to undertake.

For many years during its earlier American history, the only supply of water for domestic purposes was derived from a few wells of small capacity, and from a spring across the channel in Saucelito, from whence it was brought in boats, and distributed to the inhabitants by means of water carts ; the people purchasing it by the barrel or gallon, according to their necessities and abilities. This made fresh water a luxury to be indulged in most sparingly, and a source of expense that was grievous to be borne. For the sprinkling of streets, when done at all, and for the extinguishment of fires, the sole dependence was the water of the bay. In consequence of this, business houses were confined to an area that could be reached and protected to a limited degree, by water pumped by the fire engines stationed at or near the wharves. Insurance was enormously high, and buildings of every class were of the most inexpensive character consistent with the uses to which they were to be put. Valuable residences were entirely unknown, and the want of water seemed to put an absolute limit to the growth of the city.

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The flushing of sewers was except by the winters rains, was a thing unthought of, and the sanitary condition, for the want of an adequate water supply, was such as in any other climate would have bred a pestilence.

There was, out back of the Presidio, among the sand hills, and far removed from the then settled portion of the city, a small stream of water, lying just above the level of, and emptying into the sea, which proved to be perpetual, since and now known as Lobos Creek.

In 1857 John Bersley, A. W. Von Schmidt and Anthony Chabot, three gentlemen whose names have since become historical in connection with this and similar enterprises in the State, conceived the idea of utilizing the waters of this creek for the supply of the city and its inhabitants; and on the fifteenth of June in that year they formed an incorporation under the laws of the state for that purpose. The Articles of incorporation stated generally that the object was to introduce pure fresh water into the City and County of San Francisco, for the purpose of supplying the inhabitants thereof, and the public buildings therein, with the same; so that the corporation was not limited to this creek as its source of supply, but it was well understood that Lobos Creek was its real objective point, and it is the only source of supply which that corporation ever utilized. This Company was known as the San Francisco City Water Works, and was organized with a capital stock of \$1,500,000.00.

There was at this time no law which permitted a private person or corporation to introduce water into the city, or to lay pipes in the street, without the consent of the municipal authorities. To meet this requirement, the incorporators secured the passage, in August 1857, of an Ordinance, entitled Order No. 46, which was amended in August 1859 by an Ordinance entitled Order No. 72, of the Board of Supervisors of said city and county, both of which Orders were in due

course ratified by Act of the Legislature, and which became the franchise of this corporation. It authorized the taking and appropriation of the waters of Lobos Creek, ^{required} the construction of certain specified works for the diversion and distribution thereof, among which were pumping and hoisting works to place the water in a distributing reservoir, having a capacity of not less than six millions of gallons, and at an elevation of not less than one hundred and thirty feet above the base line of the city grade of streets; also required that at a later date another reservoir should be constructed at an elevation sufficient to supply the inhabitants of west Stockton street, and not less than two hundred and fifty feet above the base of the city grade, and of a capacity of not less than two millions gallons; and that said reservoirs should be connected with a system of iron pipes laid in the streets and alleys of the city, for the distribution of the water to the inhabitants and public buildings, of a capacity sufficient for the distribution of two millions gallons per day. No doubt these quantities seemed large, and ample for generations to come, in view of the very limited quantity of water used under the old system, but their very paucity invites a smile in these later days, when the daily actual consumption is nearly twenty millions gallons, and the cry is still for more.

This Ordinance was very full in the matter of protection to the city, and among other things reserved to the city the right at any time after the expiration of two years after the introduction of water, to become itself the owner of the works, upon reimbursing the company for the value thereof, such value to be determined by a commission to be selected in a manner therein provided. The city, however never attempted to avail itself of this provision. As an inducement to the corporators to proceed with the work, the ordinance was also lib-

eral with them, in the matter of rates to be charged for water furnished to private consumers. The provision was that the rates should be fixed by the Board of Supervisors, but should be so fixed that for the first four years after the commencement of the distribution of water through the works, they should yield a gross income of twenty-four per cent per annum upon the capital actually invested in the works -- for the next fifteen years they should be so fixed as to produce a gross revenue of twenty per cent upon the capital invested, and thereafter the revenue should be reduced one per cent per annum, until it had been brought down to eight per cent per annum. Of this gross revenue however, five per cent was to be paid into the city treasury. But this last provision was abrogated, before any revenue was derived, by virtue of the eighth section of the ordinance, which provided that if any other company was ever authorized to introduce water upon more favorable terms than those named in the ordinance, the benefits of such terms should be extended to this company; and before this company commenced to derive a revenue from its works, by a state law, another company was authorized to introduce water, without being compelled to pay any portion of its revenue to the city.

Under the provisions of the ordinance the city was also to have the free use of water from the works for all the public purposes of the city, except the sprinkling of streets, and a fountain was to be maintained in the plaza, without expense to the city. The right to the fountain was lost under section eight, in the same manner as the interest in the revenue of the company, but for many years the right to free water for other municipal purposes was insisted upon and enjoyed, as a great boon secured through the wisdom of the Board of Supervisors by whom it was passed. It was at least twenty years after the passage of this Order, before it dawned upon any considerable portion of the people that this ~~er~~provision of the order was

one of the most unjust of all its clauses, in that it imposed the whole burthen of the cost of water supply for the entire city upon the rate payers alone, without any regard to the benefits that resulted from the presence of such supply to the vast majority of the property in the city, which escaped the payment of rates, and therefore contributed nothing toward securing these benefits; for it will be remembered that rates were assessed, not upon property, but upon the persons only, who were actual consumers of the water in their private houses or places of business.

Under this Ordinance, the gentlemen named, and a few associated with them, constructed what was afterwards known as the San Francisco City Water Works, and utilized the Lobos Creek supply. It furnished the first water ever distributed through any part of the city by any other than the primitive system first in this chapter described, but it was never adequate for the supply of more than a small portion of the area of the city. It was a great benefit, but its chief good was in demonstrating the advantages of a water supply, and stimulating others to greater and more successful undertaking. The works are still maintained as a part of the larger system now in use, but not under the direction of the same corporation. The utmost has been made of them that the source of supply would admit, but neither the original company or its successor in interest has ever been able to secure from that source more than about two millions gallons per day. This is, and can be utilized only by the aid of powerful pumping works maintained at heavy expense, but the scarcity of water thus far obtainable from all sources, and the superior quality of this supply, has so far justified that expense. But it is a source that will undoubtedly be held, in the not distant future, as a mere reserve, to meet great and pressing emergencies, as when the works now in progress are

completed, the supply by gravitation will be so adequate as no longer to justify the heavy expense of pumping for the small quantity that can be gathered from this source.

At the Session of 1858, two Acts were introduced in the Legislature for the purpose of ~~encouraging~~ and promoting the organization of corporations and the investment of capital for the supply of cities and towns with fresh water. One of these was a general law for the incorporation of water companies, the other a special Act to authorize George H. Ensign and others (owners of the Spring Valley Water Works) to lay down water pipes in the public streets of the City and County of San Francisco."

These two bills were introduced at the same time and carried along together through both houses of the Legislature, the special Act reaching the Governor one day before the general law, but the latter was approved by the Governor on the 22nd of April of that year, and the special Act was so approved on the 23rd of April. The general law remitted corporations organized for the purpose of supplying cities and towns with water to the general incorporation Act of the State for the method of incorporation, and its general powers, but specially gave to corporations organized for this purpose the power to acquire lands and waters necessary for their use by the exercise of the power of Eminent Domain, or by what is commonly called the process of condemnation. This Act also gave such companies the right to lay pipes in the streets of the city without the necessity of applying to the municipal authorities for such privilege, and further provided that the rates of compensation for water supplied should be fixed by the Board of Commissioners to be appointed for that purpose, and that the company should furnish water to the extent of its means to the city or

town "In case of fire or other great necessity, free of charge."

The special Act, in express terms, gave to George H. Ensign and his associates the right to lay down distributing pipes in the streets, ways and alleys of the City and County of San Francisco; provided, that the Chief Engineer of the Department of such City, should have the right to tap the pipes so laid down, connect hydrants therewith, and receive water therefrom, for the extinguishment of any fire or fires, during the pendency of the same, free of charge, to the full capacity of said Water Works, up to and until such time as water should be introduced into said City by some other person or persons, and thereafter should furnish, for fire and other municipal uses "Their quota or portion of whatever water may be produced by them, or may be introduced by any other person or persons." This Act further provided that the rate or price to be charged for water should be fixed by a Board of Commissioners to be appointed as in the Act provided, with this proviso: "Provided, that the rates so established shall not be so low as to yield less than twenty per cent per annum on the actual capital invested in said works."

Under this general law, a large number-- probably not less than twenty-- corporations have been formed at one time or another for the ostensible purpose of supplying the City of San Francisco and the inhabitants thereof with pure, fresh water; but no one of them, except the Spring Valley Water Works, has ever introduced water into the City and County, or done any considerable work to that end.

In June, following the passage of these two Acts, and under both the general and the special law, George H. Ensign, Henry

Baker and Edward Jones formed a corporation under the name of the "Spring Valley Water Works." The avowed object of this Company was "The introduction of pure, fresh water into the City and County of San Francisco, and into any part thereof, from any point or points, place or places, for the purpose of supplying the inhabitants of said City and County with the same." Broad, as was the purpose named, it is now generally understood that the immediate object had in view at the time of incorporation was, that of utilizing the waters of a certain spring, then known to exist just back of the business portion of the City, and on what is now known as ~~Alcazar~~ *Russian* ~~Hill~~ Hill; it being then believed by the incorporators that this Spring could be opened and developed and a supply of water secured therefrom, sufficient to make the works both useful and profitable. With this limited object in view, the capital stock of the Corporation was fixed at Sixty Thousand Dollars.

Considerable time and some money was expended in the experiment of developing this Spring, which only resulted in proving its inadequacy to the furnishing of any amount of water that would render its use profitable. The Company then turned its attention to a small stream in the southern portion of the City and County, known as Islais Creek, and some work was done to develop this source of supply and bring the same into the business portion of the City. Although this enterprise was attended with a slight degree of success, it was early found that a supply could not be secured from this source, at all commensurate with the wants of the people, and the Company increased its Capital Stock to Three Million Dollars and commenced to extend its explorations for water in more distant fields.

In the latter part of 1859, the Company settled upon Pilarcitos Creek in the County of San Mateo as an available, desirable and adequate source of supply. This was a small, living stream; having its source in the mountains in the northerly part of the County, and emptying into the Ocean at or near the town of Half Moon Bay, receiving numerous additions to its flow in its course towards the sea. It was thought, at first, that the living stream, as it flowed near its source and in what was called Pilarcitos Valley, would furnish an adequate supply without constructing a storage reservoir, and that this could be secured by the erection of a small dam sufficient to turn the waters out of their natural channel into an aqueduct which should lead thence, to the City; and the work was first constructed of these dimensions only, and by means of an aqueduct, consisting mainly of a wooden flume, the waters were conducted a distance of some twenty-five miles and emptied into a distributing reservoir near the present City and County Hospital, known as Lake Honda. This Lake Honda, is located at an elevation sufficient to distribute water by gravitation from thence into nearly all the then settled portion of the City; but upon attempting to use it as a place of temporary storage and distribution it was found that the soil was so porous as to render it entirely unfit for the purpose, and the Company were compelled to line it throughout with cement, making it a work of exceeding great cost compared to anything that had been contemplated in the commencement of this undertaking.

This was hardly accomplished when it was discovered that, neither the Pilarcitos Creek or any other living stream which it was then thought practicable to bring to the City, would furnish an adequate supply for the wants of the people; and again, the Capital Stock was increased to Six Millions of Dollars and a new

dam was constructed below the junction of the Pilarcitos and Spring Valley Creeks. This was an earth-dam of such unusual proportions as rendered the work almost, if not quite, an untried experiment; the object being by means of it to create a large storage reservoir for the catchment of the waters flowing from the surrounding water sheds and in which the Pilarcitos and Spring Valley Creeks would continue to pour their summer supply, and thus keep the waters from becoming stagnant and unfit for use.

The construction of this reservoir proved an eminent success, and demonstrated the practicability of supplying a large city with catchment water-- the waters of winter stored up for summer use. This dam is now 750 feet in length, 500 feet in width at its base, 55 feet high, and 24 feet wide at the top, and has a storage capacity of 1,000,000,000 ~~million~~ gallons.

With this reservoir constructed and filled the Company believed itself able to supply any demand which might be made upon it by the people of the City, and vast sums of money were expended in laying down a system of large iron mains and distributing pipes in the principal streets of the City; but it was not long before the fact was demonstrated that even this supply was insufficient for the wants of the growing City, and experience also taught that in a country, where the rainfall was so uncertain as to quantity, safety as to water supply could only be found in a storage capacity equal to a three years supply. Again the Capital Stock was increased to Eight Millions of Dollars and the Company set to work to construct a new storage reservoir among the hills to the east of Pilarcitos. Here a reservoir was constructed upon the same plan as the other, by means of a dam 1000 feet in length, 650 feet in width at its base, 90 feet in height, and 24 feet wide at the

top; and, when completed, this reservoir had a storage capacity of 6,690,000,000 gallons, and is known as San Andreas Reservoir. The water shed of this reservoir is small compared to its storage capacity, and although it receives all the rain-fall from its own water shed and a considerable portion of the surplus fall of the water shed of Pilarcitos is conducted into it, it has never, but once, been filled to its utmost capacity.

In 1874, the Company became convinced that its catchment and storage capacity was still insufficient for the supply of a city, such as San Francisco promised to be, and it commenced to buy up lands and water rights situate in the more southerly portions of the County of San Mateo, with a view to the construction of a vast reservoir in the Valley of the Cañada, Raymundo which should more than equal all the others in capacity, and should store waters of the San Mateo Creek with its numerous feeders, and be further supplied by turning into it the waters of the San Francisco Creek at the extreme southern boundary of the County, and the waters of the San Gregorio, ^{Purissima} ~~Pilarcitos~~, and other streams in the south-western portion of the County, now emptying into the Ocean. In 1876, the Company also expended a million dollars in securing lands and waters of the Calaveras Valley, lying in the Counties of Alameda and Santa Clara. It then increased its authorized Capital Stock to Sixteen Millions of Dollars, Ten Millions of which has already been paid up and issued, thus making the small Company which was organized by Ensign and his associates the largest commercial corporation in the State. It, some years since, constructed in the Cañada Raymundo a reservoir called the Upper Crystal Springs Reservoir, having a capacity of nearly four billion gallons, which is already filled, and all its large storage reservoirs now constructed, are

now pouring their waters through long lines of iron aqueducts into numerous distributing reservoirs situated in different parts of the City, from whence it is distributed through more than two hundred miles of iron mains and distributing pipes laid in the streets of the City, to its inhabitants, and to the public parks and buildings of the municipality. Where it was once thought that two million gallons per day would be equal to the wants of the people, twenty million gallons per day are now supplied, and the want of more water is such an urgent necessity, that the Company is actively engaged, with several hundred men in its employ, in the construction of a stone and cement dam at the point where the San Mateo Creek breaks through the mountain from the Cañada Raymundo and flows eastward into the Bay, with a view to the final completion of the immense storage reservoir, before mentioned, and also in the construction of a dam across the Alameda Creek in the County of Alameda, by means of which it is expected to secure the vast body of water coming down from the Calaveras and other feeders of the Alameda Creek and turn them into this large artificial lake in the County of San Mateo, whence they will be conducted to the City of San Francisco, and a supply will be secured equal to the utmost demands of a population of half a million people.

The works have not reached their present magnitude without a severe struggle. Large sums of money were put into them before any return was received, and the effort to make the works profitable, and at all commensurate with the wants of the people, is said to have bankrupted Mr. Ensign, the original grantee of the franchise, and several of his associates; and it has only been through the enterprise, courage and perseverance of such men as ^{W. L. Sullivan} William H. Tillinghast, Charles Mayne, William F. Babcock and Charles Webb Howard, who have successively held the position of President

of the Corporation, and of large and liberal capitalists, who have been associated with them; and under the superintendence of Mr. William H. Lawrence and the skillful engineering of Mr. Herman Schusler, their present degree of success has been ~~at~~ ^{ob}tained.

The Capital Stock, which at one time could be bought very low, is now sought as a means of permanent and safe investment, and although it fluctuates slightly in price from a little below to a little above par, it is regarded as one of the most desirable stocks in the market, and pays regular monthly dividends at the rate of six per cent per annum on the par value thereof. The Company has outstanding, a first mortgage bonded indebtedness of \$4,975,000.00 issued in 1876, bearing six per cent interest. These bonds command a premium in the market at from twenty-nine to thirty per cent. The Company recently authorized an issue of Five Million Dollars, second mortgage bonds, bearing interest at the rate of four per cent per annum, of which One Million Dollars has been offered on the market, and was readily sold at a premium of two per cent.

In 1865 this company purchased the property and rights of the San Francisco City Water Works, and has ever since furnished all the water used in San Francisco, except that to a very limited extent water ^{is} ~~is~~ still drawn from wells within the city.

Although all the laws and ordinances under which they were incorporated provided for the fixing of water rates by a Board of Commissioners to be appointed in part by the municipal authorities, and in part by the companies, no such commission was ever appointed until 1878; but the companies were left instead to fix the rates for themselves. Notwithstanding this fact, rates were never charged that would give an income such as the laws and

ordinances permitted--the highest rate of dividend ever paid being but twelve per cent per annum, subsequently reduced to eight, and now, as before stated, reduced to six per cent.

In 1869, at a period of great scarcity of water, when the Company had reason to fear that the supply would be insufficient to tide over until another rainy season, the municipal authorities threatened to tap the pipes and mains, and take water therefrom for the sprinkling of streets, flushing of sewers, and irrigation of parks, without compensation to, or consultation with the company, and out of this threat grew up a series of litigation with the city, which contributed, perhaps more than any other one thing, (except that of taxation), towards a radical changing of the constitution of the State.

The company had never denied, and probably never would have questioned, the right of the city to water free of charge, for the extinguishment of fires, or objected to any other reasonable demand on the part of the city for water. But when it proposed to jeopardize the safety of the inhabitants, who alone were depended upon for a revenue upon the corporate investment, by tapping the pipes at pleasure, and without consultation, and taking water for these extraordinary purposes, the company found its entire capital imperilled, and denied the right of the city to free water for any purpose other than the extinguishment of fires, and threatened to cut off the supply of the city, if any such attempt was made. Thereupon the city commenced a suit by injunction, to restrain the company from cutting off the city, or in any manner interfering with its proceedings in the matter of tapping the pipes, and taking water for any public use that it might desire. It was claimed that this right was vested in the city because of the fact that this company was the successor in interest of the San Francisco ^{City} Water Works, and that under the franchise of that corporation, the city was entitled to water free of charge for all

municipal uses. On the other hand the company claimed that by the passage of the Ensign Act, hereinbefore referred to, the San Francisco City Water Works had been relieved from all obligation to furnish water free of charge, except for the extinguishment of fires, and that neither as successor to that company, or otherwise, was it bound to furnish water free of charge for any other purpose. The Court of original jurisdiction, and the Supreme Court, ~~twice~~ ^{Park} twice sustained the view of the company, but upon a rehearing, after the second decision of the Supreme Court, it was finally decided that the Ensign Act was special legislation, and as such unconstitutional ; and as a consequence, that all the rights of the company, and all its obligations, were such as were prescribed in the general law of 1858 before referred to ; and that under that law the Company was bound to furnish ^{water} to the municipality free of charge "in case of fire or other great necessity." The Court declined at that time, and never afterwards did, determine what constituted "other great necessity" within the meaning of the statute ; resting simply upon the proposition that no case had been presented in which the Court could say the demand was not one which came within the meaning of these words.

This decision was both a matter of surprise, and of great rejoicing to many of the people, and great credit was given to the counsel on behalf of the people, for having made and successfully presented the point. But it was not a surprise to the company, for its Attorney, Mr. Chas. N. Fox, had advised the company in writing, before the litigation commenced, that if the point was ever made, the Ensign Act would be declared unconstitutional, and throughout the whole history of the case he carefully avoided touching the point. But the truth of history compels us to note the fact that the counsel for the city did not make the point, but, as will be seen by reference to the report of the case, in the 48th of California Reports, page 493 and

following, they combatted it, at every stage of the argument, while the point was in fact presented by the associate counsel of the company, and the decision on that particular proposition was in support of their argument, although the effect, in view of the fact that no limitation was ever put to the meaning of the term "other great necessity," proved for the time disastrous to the company.

After the first decision was rendered in this case, and before its final conclusion, the municipal authorities entered into a contract with the company, to pay it for water for the public buildings, and for other municipal uses, except the extinguishment of fires. Under this contract payment was made to the company for three months, at the rate of two thousand dollars per month, but at the expiration of that period, acting under the advice of counsel, the city refused to make further payment, and a demand accrued, before the expiration of the contract, to the amount of \$96,000.00, and was finally allowed by the Board of Supervisors, but Mr. Monroe Ashbury, then the Auditor of the City and County, refused to audit the same, and action was brought to compel him to do so. This action was fought for years, and never was finally determined, the last decision in the case being in favor of the auditor, but the matter still remaining pending in another form, until some years after the adoption of the new constitution of the state, and a new order of things had become established thereunder, when the company voluntarily dismissed the suit, and released the city from all claim for water furnished prior to the adoption of the new constitution.

Although the rates charged for water were never equal to those authorized, and in fact, at least by fair implication, pledged by the ordinances of the city, and by the Ensign Act, passed to encourage the construction of works, great complaint was made of the excessive cost of water, the people seeming not to realize that the cost

in such a climate, and under such circumstances as existed here, was excessive to producers, and so necessarily excessive to consumers ; especially so since the municipality itself, which was by far the greatest consumer, contributed nothing to reimburse that cost. In consequence of this complaint, and of the litigation which had been had, special attention was given to the subject of water supply, when the people assembled in 1879 to frame a new constitution, and by that instrument it was declared that all water now appropriated, or that might hereafter be appropriated for sale, rental or distribution, was a public use, and subject to regulation and control of the State, and the right to have a voice in the selection of the tribunal to fix rates was taken from the company, and placed directly in the hands of the municipal authorities. This led to another long and bitter litigation, which came up in several forms, and in divers different suits between the company and the city authorities, until finally it assumed a form in which it was carried to the Supreme Court of the United States ; in which the company contended that the laws in force at the time of its organization, and which were passed as an inducement to invest capital in a hazardous enterprise to supply a great public want, amounted to a contract, guaranteeing to it the right to have a voice in the fixing of rates, or in the selection of the tribunal that did fix them, and which could not be abrogated by the people or the state, without its consent. In this however, it was finally overruled by the highest tribunal in the land, who held that under the constitution in force at the time of the passage of the laws referred to, those laws were subject at any time to amendment, alteration or repeal, and that such alteration or repeal could be effected as well by a change of the constitution as by legislative enactment.

This proposition being established beyond further cavil, the

company immediately took advantage of the position, (if indeed it had not been all the time fighting to that end,) and insisted that under another portion of the constitution, which up to that time had not attracted particular attention, all the laws which gave the city the right to water free of charge, had been repealed. Again, and on this proposition, a series of suits were instituted, which finally resulted in a decision of the Supreme Court of the State, sustaining the position of the company, and holding that while the city had the power to regulate the rates to be paid for water, she must herself pay for all that was used for municipal purposes, the same as any private individual.

This closed a long series of interesting and bitterly contested suits between the company and the municipal authorities. It enabled the company to consent to a material reduction in the rates charged to private consumers, and the complaints of the price charged for water have almost ceased to be heard. The city annually regulates the rates, and regularly pays for the water used from the works for the extinguishment of fires, and for all other municipal uses ; and the company is thus encouraged and strengthened in its great work of increasing the supply to an amount that shall render the city and its inhabitants forever secure from the dangers of a water famine.

Although it has not been our purpose, nor was it consistent with the object of this work, to give the details of either litigation or legislation upon the subject, this chapter would be incomplete in a historical point of view, if we omitted to mention that several Acts of the Legislature have been passed at different times, for the purpose of enabling the city to purchase or construct its own water works, and some money has been expended in exploration and engineering

work, looking to that end, but the result has shown the necessity for so large an expenditure that the city has never yet undertaken to fi-

fully accomplish that work.

The reader, looking at the map of the City and County of San Francisco, and seeing a considerable body of water lying in the southern portion thereof, marked Laguna Merced, may be led to inquire why this has not been utilized for the supply of the city and its inhabitants, instead of bringing water from such great distances, and having to store such vast quantities of catchment water. In answer to such inquiry it is proper to explain: Laguna Merced is a body of fresh water, the surface of which is but slightly above high tide water of the sea, and the bottom of which, though the lake is comparatively shallow, is considerably below the waters of the sea. Ordinarily a small rivulet runs from it to the ocean, from which it is separated, by the course of the stream, only about a half mile. The ground, along the course of this outlet, and for a considerable distance on each side of the little stream, is composed entirely of sand washed up from the sea, and there is no reason to doubt, but on the other hand every reason to believe, that at no distant period in the past, this lake was in fact an arm of the sea, whose point of connection with the larger body has become choked up by the washing sands, and gradually, by the floods of winter, and the seepage from the surrounding water shed, fresh water has been added, until now, what was once a small salt water bay has become a fresh water lake. This fact is demonstrated among other things by the fact that in the last forty years the water has been steadily improving in quality, and becoming less brackish, and showing less and less the effect of salt water in its composition. When the work commenced of seeking water for the supply of the city, the waters of this lake, by reason of their strong saline character, and the large amount of vegetable matter in them, were deemed to be unfit for domestic use. It has no stream flowing into it, but the water shed by which it is surrounded, though small, is

peculiar in its formation, being composed almost entirely of a deep layer of sand, which drinks up the greater part of the winter rains, and they gradually seep out, during the dry season, into the lake, thus making its supply comparatively uniform throughout the year, although its outflow gradually diminishes towards the end of every year. The water however, has been steadily improving in quality, ever since observations have been made of it, and it is now of fair quality for domestic use. Observing this tendency to improvement, the Spring Valley Water Works, several years since, acquired an interest in the lake, expended considerable money in clearing out the vegetation in it, and put up extensive pumping works, whereby it could, whenever occasion required, utilize the supply which it afforded. It has done this to some extent, in seasons of scarcity, and fully tested the capacity of the lake as a source of supply. It can be relied upon for an average of only three or four million gallons per day, and this can be utilized only by the use of pumping machinery, and at great expense. But even under these circumstances, it has been deemed an important adjunct, to be held in reserve, to meet any contingency of drouth or of accident, which should cut off or diminish the supply from other sources ; and the company has, at an expense of some half a million dollars, secured entire control of the lake, and the land around it, and holds the same in reserve, for the purposes mentioned, ready to pump from it at any moment, should necessity require it.

Great as this enterprise has become--important and valuable as it is to the stockholders, the benefits derived from the works by them are infinitesimal, compared to those conferred upon the city and its inhabitants by the presence of such works. As already seen, it has reduced the cost of this great necessary of life to consumers to at least one-tenth, and probably one-twentieth what it was, and still would be, were it not for the presence of these or similar works.--- But this is not all ; these works have rendered possible the construction and habitation of a great city, where before, and without them or works like them, still would be but a hamlet. -- Owing more to the presence of these works than to any other one cause, the assessed value of real estate, exclusive of improvements, is now four times as great as the total amount of the entire assessment roll at the time of the commencement of the works ; the assessed value of improvements alone is double the total of the entire assessment roll then, and the assessed value of personal property is nearly double the entire assessment roll of those days. The entire rate to consumers might be wiped away, and water furnished as free as the air we breathe, and the entire income of these works assessed as a direct tax upon property, in consideration of the advantages derived to it, and its increased valuation by reason of the abundant supply of water, and the rate of taxation for that purpose would be less than three fourths of one per cent upon such increased valuation. Again, in the matter of reduced cost of insurance--all other rates could be dispensed with and the entire income of this corporation assessed upon the property actually insured within the city and county, and the annual rate would be less than one third the amount annually saved in cost of insurance, by reason of the protection afforded by the presence of this water supply.

*The within data taken from Spring Valley
Water Co by G H M*

CHARLES WEBB HOWARD,

President Spring Valley Water Works.

English Stock. Born in Vermont, January 23d, 1831; resided there and in New Hampshire until October, 1852, when he started for Galveston, Texas, for his health, remained there and in New Orleans until the latter part of January, Then started for California, via Nicaragua; was shipwrecked on the steamer Independence about 4 o'clock in the morning of the 14th of February, off Marguerita Island which makes Magdalena Bay. Came from there in the whaleship Meteor, arriving in San Francisco April 1, 1853; where, and in Oakland he has since resided. He was engaged in mercantile pursuits until 1865, when he went out of business and purchased a third interest in the Point Reyes Ranch, containing about seventy-one thousand acres, in Marin County, his father-in-law, Judge Oscar L. Shafter and James McM. Shafter, Esq., each owning a third interest therein. After devoting nine years to the developing of that property into dairy ranches, he became a large stockholder in the Spring Valley Water Works; was elected its President in December, 1874, and has occupied that position ever since.